Impact of ESG Score on Firms' Performance Based on Empirical Examination of the Chinese Stock Market

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Abstract. There is a certain correlation between ESG and corporate performance. ESG considerations are the basis of sustainable investment, and the market has more and more demand for ESG data. Major rating agencies are also paying more and more attention to analyzing ESG information and converting it into quantitative data. Strengthening the management of corporate ESG disclosure, improving ESG ratings, and further improving corporate ESG performance will become the core components of any listed company's strategy and policy. It is crucial to investigate the impact of ESG scores on firms' performance. This article considers information on China's A-share market in 2022 to confirm the effect of ESG scores on companies' performance. The paper finds that ESG score has a positive impact on company performance, which can improve the ROA and ROE of the company. It is important to help CEO and the owners of the company to make the firm's future development strategy.

Keywords: Firms' performance; ESG score; Chinese stock market.

1. Introduction

In order to respond to national policies and help achieve the overall goal of "dual carbon", most listed companies should pay attention to the role of ESG in promoting enterprises [1-2]. It is crucial to seize the opportunities for ESG development, and use ESG as a key component of business models and operations to enhance company value while contributing to the realization of sustainable social development [3-5].

ESG stands for Environment, Social Responsibility, and Governance. It focuses on the value concept of environmental, social, and corporate governance performance. It is a key factor when measuring the sustainability and ethical impact of an enterprise or company's investment strategy. The ESG practice began in the 1960s when a sense of social responsibility led investors to exclude stocks or even entire industries from their portfolios in companies engaged in tobacco production or business activities involved in apartheid South Africa [6-7]. After more than half a century of promotion and development, the scope of ESG considerations has been greatly expanded, including the impact of corporate business behavior on climate change, sustainable use of natural resources, ethical considerations, consistent values, human capital, product responsibility, corporate governance, and many other aspects.

With the rapid development of ESG concepts in the past 10 years, the importance of ESG has been widely popularized, and legislators and regulators have increasingly paid attention to ESG-related information disclosure. The European Union promulgated the "Non-Financial Reporting Directive" in 2014, requiring large companies with more than 500 employees to disclose ESG information; the US Securities and Exchange Commission (SEC) issued "Guidelines for Disclosure on Climate Change-Related Issues on February 8, 2010" Opinions"; the Hong Kong Stock Exchange issued the "Environmental, Social and Governance Guidelines" in 2012 [8-9], recommending that all listed companies disclose ESG information, and from July 1, 2020, the ESG disclosure requirements will be further increased, and each company is required to provide A board statement emphasizing environmental, social and governance considerations; the China Securities Regulatory Commission signed the "Cooperation Agreement on Jointly Carrying out Environmental Information Disclosure of Listed Companies" with the Ministry of Environmental Protection in 2017, and revised the "Governance Guidelines for Listed Companies" in 2018 , which stipulates that listed companies are obliged to disclose ESG information [10-11].

In 2021, 1,125 companies in the A-share market will issue ESG reports, but the proportion of A-share companies issuing ESG reports has fluctuated in the past 10 years without a significant increase. The ESG report disclosure rate of the CSI 300 constituent stocks is much higher than the average level of A-shares and has increased significantly.

As investors pay more and more attention to the ESG performance of the investment target, companies with higher ESG standards have better stock liquidity, and should be reflected in quantitative analysis such as liquidity discounts. Specifically, in the estimation and application of the liquidity discount (DLOM), the positive impact of ESG performance on investors and the negative correlation with stock liquidity should be considered. Therefore, ESG can affect the business performance of a company. With the rapid development of environmental, social responsibility, and corporate governance (ESG) concepts in the past 10 years, the importance of ESG has been widely popularized. ESG's role has become increasingly prominent. This article tries to investigate the impact of ESG rating scores on firms' performance.

Based on the regression model, this study finds that the ESG score has a positive effect on firm performance, which can raise the company's ROA and ROE. Additionally, the company's cash assets have a significantly favorable effect on its performance. The company's cash flow and characteristics as a state-owned enterprise would lower corporate performance.

The remainder of the article is organized as follows. Section 2 presents the data. Section 3 shows the method. Section 4 illustrates the analysis of the results. Finally, Section 5 summarizes the conclusion.

2. Data

In order to study the effect of a firm's ESG rating on a firm's performance, the author of this paper gathers data from the Chinese stock market. Based on Wind's score, the ESG rating index is created. Based on the Wind database, the article utilizes the ROE and ROA as an index to evaluate the firm's performance. In addition, the paper gathers a number of control factors from each firm's website, including, the firm's size, total assets, firms property, and current cash of the firms. The following table displays the specific variables.

Additionally, when doing research, this paper excluded financial institutions like banks, brokerages, and businesses with incomplete data, ultimately obtaining a series of samples.

Table 1. Notation for variables

	Variable	The explanation for each variable
Firm's performance	ROE	Return on net assets
	ROA	Return on total assets
ESG factor	ESG	Firms' ESG Score based on Wind
Control	Size	Firm's size
	Property	1 means state-owned enterprise; 0 means non-state-owned enterprise
	Asset	Firm's total asset
	Cash	Firm's current cash

3. Method

ESG affects returns and risk levels through internal mechanisms. At present, many academic studies at home and abroad have found that ESG evaluation results have a strong correlation and positive impact on corporate financial performance and investment performance. For example, Oxford University reviewed 200 pieces of high-quality literature. It shows that companies with excellent ESG have long-term stable performance and better operating performance, and also have a positive impact on investment performance.

However, for investors, "correlation is not the same as causation", many investors do not know the mechanism of action of ESG, and it is difficult to make investment decisions. This is also an important reason why it is difficult for many institutional investors and individual investors to practice ESG investing. In fact, ESG has an impact on corporate value through internal mechanisms. We start from the simplest DCF model to analyze the mechanism of action of ESG [12]. In the DCF model, the stock price is equal to the discounted value of future cash flow, which is determined by the cash flow CF received by investors in each period and the discount rate R. The cash flow CF in each period is the dividend received by the investor, which can be simplified as each period Share net profit × dividend payout ratio. ESG can affect the stock price by improving the profitability and dividend rate of listed companies, which is the profitability improvement mechanism of ESG. From the perspective of the discount rate of cash flow, the discount rate is related to the risk degree of the stock. If the systematic risk and idiosyncratic risk of the listed company are at a high level, the discount rate will also be at a high level. This is the risk transmission mechanism of ESG.

In this article, ROA and ROE are the independent variables, with ESG score acting as the dependent variable. The firm's cash, assets, size, and property are also established as the control variables. In order to explore the effect of the firm's ESG score on firm's performance based on the Chinese stock market, we thus derive the following regression model.

$$ROE = \beta_0 + \beta_1 \times ESG + \beta_2 \times Cash + \beta_3 \times Asset + \beta_4 \times Size + \beta_5 \times Property \tag{1}$$

$$ROA = \beta_0 + \beta_1 \times ESG + \beta_2 \times Cash + \beta_3 \times Asset + \beta_4 \times Size + \beta_5 \times Property \tag{2}$$

4. Result analysis

4.1 data description

This article found that the mean value of ROE was 3.270678, the range was between -405.718 and 143.2696, and the standard deviation was the largest. The mean value of ROA was 2.963365, and the range was between -24.8541 and 144.6021. The mean value of the ESG score was 6.086737, and the range was between 3.87 and 9.31. The standard deviation is 0.749931. The logarithmic cash, logarithmic assets, enterprise size, and company attribute mean values are 20.34528, 22.31251, 2.699526, and 0.269569, respectively based on Table 2.

Table 2. Data description

Variable	Mean	Std. Dev.	Min	Max
ROE	3.270678	11.70596	-405.718	143.2696
ROA	2.963365	5.009385	-24.8541	144.6021
ESG	6.086737	0.749931	3.87	9.31
Cash	20.34528	1.473814	14.41646	26.56396
Asset	22.31251	1.363627	18.4354	28.65082
Size	2.699526	0.51725	0	3
Property	0.269569	0.443786	0	1

According to Table 3, this paper also conducts a correlation analysis on each variable to determine whether the ESG score has a relevant impact on the performance of the company. We found that the ESG score has a positive correlation with both ROE and ROA, and it is significant at the 99% significance level. Cash, assets and company size all have a certain impact on ROE. Cash, assets and company attributes have a certain impact on ROA. In the following, we will further judge the relationship between ROA and ROE and ESG score through scatter plots.

According to the results in Figures 1 and 2, we judged that there is a linear correlation between ROA and ROE and ESG scores, respectively, so it is suitable for a linear regression model to test the relationship between variables.

Table 3. Correlation analysis

	ROE	ROA	ESG	Cash	Asset	Size	Property
ROE	1						
ROA	0.6342*	1					
ESG	0.0944*	0.0741*	1				
Cash	0.1417*	0.1490*	0.1774*	1			
Asset	0.0694*	0.0831*	0.1224*	0.8675*	1		
Size	0.0461*	0.0238	0.0465*	0.4051*	0.4690*	1	
Property	-0.0147	-0.0473*	-0.0289	0.3194*	0.3780*	0.1681*	1

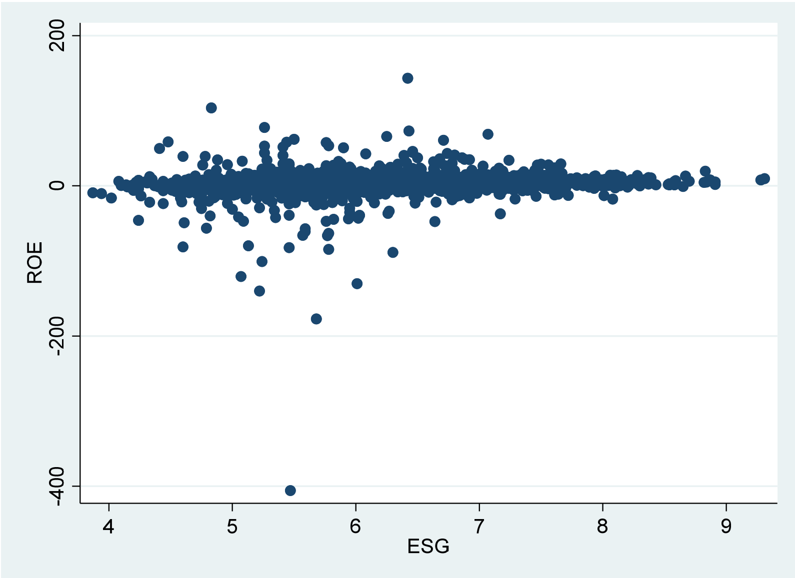

Figure 1. Scatter of ROE and ESG

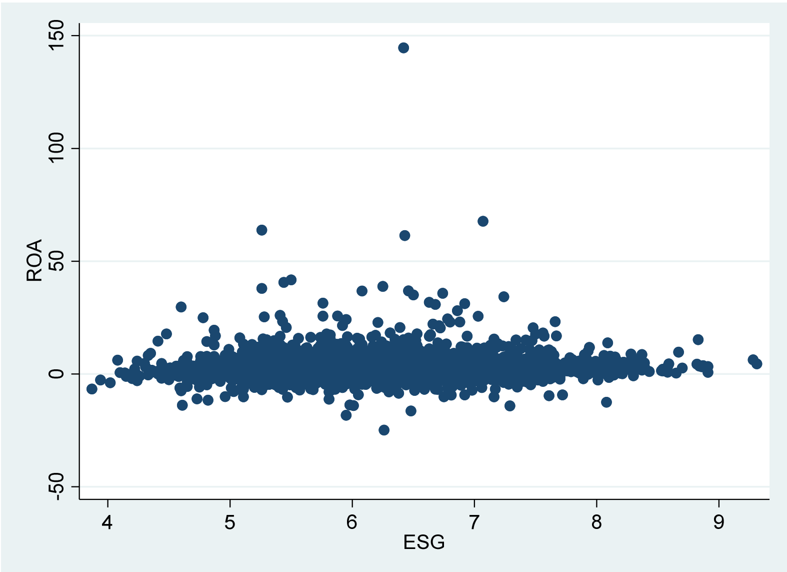

Figure 2. Scatter of ROA and ESG

4.2 Regression result

According to Table 4, this paper finds that the ESG score has a positive impact on the company's ROE. Without considering the control variables, each additional ESG score will increase the company's ROE by 1.475 percentage points. After adding control variables, ESG scores still have a significant positive correlation with ROE, which is consistent with the results of the correlation analysis. During the study of the control variables, we found that SOEs have a negative impact on company performance compared to non-SOEs. The company's total assets also have a negative impact on the company's performance. The cash flow increases the performance of the company.

Table 4. Regression analysis for the impact of ESG on ROE

	(1) ROE	(2) ROE	(3) ROE
ESG	1.475***	1.009***	.966***
	(.234)	(.235)	(.236)
Cash		2.475***	2.471***
		(.239)	(.238)
Asset		-1.787***	-1.729***
		(.256)	(.27)
Size			.426
			(.379)
Property			-1.032**
			(.422)
_cons	-5.71***	-13.347***	-15.177***
	(1.434)	(3.046)	(3.227)
Observations	4425	4425	4425
R-squared	.009	.036	.037

Standard errors are in parentheses
*** $p<.01$, ** $p<.05$, * $p<.1$

Based on Table 5, This study discovers that ESG has a favorable positive effect on ROA for the company. Without taking into account the control factors, every additional ESG score will result in a 0.495 percentage point boost in the company's ROA. Even after accounting for the control variables, the ESG score still significantly positively correlates with ROA, increasing ROA by 0.243 percentage points for every unit of ESG score. When we looked at the control variables, we discovered that the findings matched those in Table 4.

Table 5. Regression analysis for the impact of ESG on ROA

	(1) ROA	(2) ROA	(3) ROA
ESG	.495***	.288***	.243**
	(.1)	(.101)	(.101)
Cash		1.016***	1.012***
		(.102)	(.102)
Asset		-.662***	-.504***
		(.11)	(.115)
Size			-.18
			(.162)
Property			-.972***
			(.18)
_cons	-.055	-4.7***	-7.133***
	(.614)	(1.304)	(1.378)
Observations	4425	4425	4425
R-squared	.005	.033	.04

Standard errors are in parentheses
*** $p<.01$, ** $p<.05$, * $p<.1$

5. Conclusions

This study gathers information on China's A-share market in 2022 to confirm the effect of ESG scores on companies' performance. Data from banks and other financial institutions and businesses are not included in this study. The paper explores the effectiveness of ESG ratings on corporate performance, which is empirically examined using regression analysis.

This paper finds that the ESG score has a positive impact on company performance, which can improve the ROA and ROE of the company. In addition, the company's cash holdings also have a positive impact on the company's performance. The company's assets and state-owned enterprise attributes will reduce the corporate's performance.

There are still some limitations in this study. This article does not consider the impact of ESG scores on the corporate performance of companies in the eastern and western regions. In addition, the sample size of the companies in the study only has cross-sectional data, and the time factor is not considered. In the future, this paper will consider the influence of different regions and the influence of time factors for further research.

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