

The Impact of Corporate ESG Performance on Stock Liquidity: Evidence from Chinese A-Share Listed Companies

Rongyuan Wu *

School of Economics and Management, Nanjing University of Science and Technology, Nanjing, China

* Corresponding Author Email: reoii557@163.com

Abstract. This paper examines the impact of corporate ESG performance on stock liquidity using a sample of Chinese A-share listed companies from 2015 to 2022. The results show that good corporate ESG performance significantly enhances stock liquidity. The conclusion remains robust after a series of robustness tests. This study provides empirical evidence for the positive effect of ESG performance on stock liquidity and offers insights for improving ESG-related policies in China.

Keywords: Corporate ESG performance, Stock liquidity, Listed companies.

1. Introduction

With the economic globalization bringing about world economic prosperity, it has also led to an increasing number of global issues. The inherent demand for green and sustainable development is growing, and investors' awareness of environmental protection and other aspects is gradually increasing. Against this trend, the concept of ESG emerged. ESG includes three major factors: Environment, Social, and Governance. It was first explicitly proposed in the 2004 United Nations Global Compact Plan. It is a series of investment philosophies and corporate evaluation standards that measure corporate performance in environmental, social, and governance aspects rather than financial performance. As the influence of the ESG concept continues to expand, more and more institutions are incorporating ESG factors into their investment systems. Regulatory agencies and stock exchanges in various countries have successively formulated relevant policies to strengthen the management of ESG information disclosure by listed companies. Meanwhile, ESG evaluation standards and frameworks are becoming increasingly refined, and the active involvement of governments and regulatory authorities has accelerated the development of ESG ecosystems in various countries.

At the same time, China's stock market is also facing many difficulties, one of which is the issue of stock liquidity. As an important part of the financial market, the liquidity of the stock market itself plays a crucial role in the healthy and stable operation of the entire market. Stock liquidity is the basis for the normal pricing of the stock market and also reflects the allocation of market resources. Unstable stock liquidity or an imperfect mechanism will hinder the development of the stock market and reduce the efficiency of resource allocation.

Therefore, against the current background of ESG being at its peak of development in China, this paper explores the impact of the ESG performance of Chinese listed companies on their stock liquidity, which is necessary for the study of factors affecting stock market liquidity.

2. Literature Review

Regarding the impact of ESG on various corporate indicators. Research on the impact of ESG activities on the cost of capital. Cantino et al. (2017) ^[1] concluded that ESG activities significantly reduce the cost of equity, debt, and overall capital cost. Qiu Muyuan and Yin Hong (2019) ^[2] used a panel data model to study the impact of corporate ESG performance on their financing capacity and financing cost. The results showed that companies with better ESG performance had significantly lower financing costs, and the quality of corporate information disclosure played a significant role in the above relationship. Regarding corporate performance, Samet and Jarboui (2016) ^[3] studied a

sample of 398 companies from 2009 to 2014 and found a weak negative correlation between corporate social responsibility activities and free cash flow. Dong Shulan and Liu Hao (2018) ^[4] believed that the higher the level of social responsibility information disclosure, the better the corporate performance, and further confirmed that state-owned enterprises should enhance media attention to the company by increasing the transparency of social responsibility information to meet the public's expectations regarding the fulfillment of social responsibilities by state-owned enterprises. Ge Dandan and Qi Dianwei (2023) ^[5] believed that the ESG performance of manufacturing enterprises has a significant positive impact on their corporate value, and the impact is greater on enterprises with higher maturity.

Regarding ESG and stock liquidity. Existing studies have found that various factors affect stock liquidity. Brockman and Chung (2003) ^[6] believed that market volatility and investor factors affect stock liquidity. Busch and Lehnert (2014) ^[7] believed that policy announcements or uncertainty affect stock liquidity. In addition, the ESG information disclosed by companies also affects stock liquidity. Chung (2014) ^[8] proved through research that there is a significant relationship between corporate governance and stock liquidity due to information disclosure. Chen (2023) ^[9] used methods such as DID to illustrate that corporate ESG performance can enhance stock liquidity by influencing institutional investors' preferences and risk mitigation.

3. Theoretical Analysis and Research Hypothesis

From the perspective of information effects, corporate disclosure of ESG responsibility reports can convey non-financial characteristic information to the capital market and release positive signals. ESG ratings convey the company's performance in the fields of environment, social responsibility, and corporate governance, as well as its commitment to the concept of green and sustainable operation, to capital market investors, thereby enhancing the transparency of corporate information and reducing information asymmetry between the enterprise and its stakeholders. Therefore, when investors have a more accurate understanding of the company's situation, they are more willing to buy or sell stocks, thereby enhancing the activity of stock market trading.

From the perspective of limited resources, based on the limited resource theory, the resources possessed by an enterprise, including capital and human resources, are limited. When corporate resources are limited, managers will prioritize the investment of funds into the main business areas closely related to corporate development, such as procurement, research and development, production, internal control, and after-sales service, to better promote the steady development of the enterprise. At the same time, when the enterprise has sufficient funds to invest in activities that are not directly related to the enterprise's revenue, such as environmental improvement, community service, and corporate governance, it indicates that the probability of problems such as capital shortage in the current development stage of the enterprise is small, and the enterprise has sufficient resources and can better comply with relevant national policies such as ecological environmental protection^[10]. Corporate ESG practices and information disclosure will further enhance corporate reputation, help establish a good brand image, attract the attention of the capital market, and enhance the liquidity of corporate stocks.

Based on the limited attention theory, the number of stocks that investors in the capital market can pay attention to is limited. Under the current background of imperfect ESG information disclosure systems, whether enterprises carry out ESG practices and information disclosure has different impacts on capital market investors. As one of the key indicators to measure the sustainable development capability of enterprises, ESG ratings are leading the investment community towards a more comprehensive and long-term investment approach, guiding investors to extend from the traditional financial indicator evaluation system to a more comprehensive corporate development evaluation system that includes corporate ESG performance. That is, the positive impact of corporate ESG performance on stock liquidity is becoming more significant in this context.

4. Research Design

4.1. Sample Selection and Data Sources

This paper selects Chinese Shanghai and Shenzhen A-share listed companies from 2005 to 2022 as the research sample. Corporate ESG rating data and other corporate data are from the CSMAR database. Considering the reliability of the sample, the sample screening process is as follows: ① Exclude ST and delisted samples during the period; ② Exclude enterprises with missing data and abnormal data; ③ Exclude financial industry enterprises; ④ Exclude enterprises that conducted IPOs during the inspection period; ⑤ To reduce the interference of outliers or outliers on data analysis, the continuous variables at the micro level are subjected to 1% and 99% tail reduction. After the above processing, 24,742 observations are finally obtained.

4.2. Variable Setting

4.2.1. Explained Variable

Stock Liquidity (Liquidity). Existing scholars have revealed through comparison that, for the Chinese capital market, the non-liquidity indicator is a more appropriate indicator to measure corporate stock liquidity^[11]. Therefore, this paper refers to the research methods of relevant scholars and calculates the stock liquidity indicator (ILLIQ) according to formula (1).

$$ILLIQ_{i,t} = \frac{1}{D_{i,t}} \sum_{d=1}^{D_{i,t}} \sqrt{\frac{|r_{i,t,d}|}{V_{i,t,d}}} \quad (1)$$

In the above formula, $|r_{i,t,d}|$ represents the return rate of enterprise I on the d-th trading day of year t considering cash dividend reinvestment; $V_{i,t,d}$ represents the transaction amount of enterprise I on the d-th trading day of year t, in millions of RMB; $D_{i,t}$ is the number of trading days of enterprise I in year t; $|r_{i,t,d}|/V_{i,t,d}$ is the rate of change caused by per unit transaction amount of stock I on the d-th trading day of year t. After summing and taking the average, it is the non-liquidity indicator. The larger the ILLIQ value, the greater the impact of per unit transaction amount on the stock price, the higher the transaction cost for investors, and the lower the stock liquidity, and vice versa.

To make the empirical results easy to read, the stock liquidity indicator Liquidity in this paper is measured by the opposite number of the non-liquidity indicator, calculated as follows:

$$\text{Liquidity} = -ILLIQ \quad (2)$$

4.2.2. Explanatory Variable

ESG Performance. Referring to the practices of relevant literature^[12], the Huazheng ESG rating is selected to measure the corporate ESG performance. According to the Huazheng ESG evaluation system, Corporate ESG performance is assigned a score of 1-9, with a higherscore indicating better ESG performance.

4.2.3. Control Variables

To improve the accuracy of the research, drawing on the literature of relevant scholars^[13], this paper incorporates a series of control variables that potentially affect stock liquidity, including asset-liability ratio (Lev), corporate age (Age), the shareholding ratio of the largest shareholder (Top1), cash flow ratio (Cashflow), return on equity (ROE), circulating share ratio (Outshare), duality of CEO and chairman (Dual), and book-to-market ratio (BM). The specific variable definitions are shown in Table 1 below.

Table 1. Variable Definition

Variable Type	Variable Name	Variable Definition
Explained	Liquidity	a larger Liquidity value means higher stock liquidity of the enterprise
Explanatory	ESG	assign Huazheng Index ESG rating 1-9 points, higher value represents better ESG performance
Control	Lev	year-end total liabilities / year-end total assets
	Age	ln(Current year – listing year + 1)
	Top1	number of shares held by the largest shareholder / total number of shares
	Cashflow	net cashflow from operating activities / total assets
	ROE	net profit / average balance of shareholders' equity
	Outshare	proportion of circulating shares in total share capital
	Dual	1 if the chairman and general manager are the same person, otherwise 0
	BM	book value / total market value

4.3. Variable Setting

To study the impact of corporate ESG performance on stock liquidity, the regression model established in this paper is as follows:

$$\text{Liquidity}_{i,t} = \beta_0 + \beta_1 \text{ESG}_{i,t} + \beta_j \text{Controls}_{i,t} + \gamma_t + \mu_i + \varepsilon_{i,t} \quad (3)$$

In the regression model, the explained variable is stock liquidity (Liquidity), the explanatory variable is corporate ESG performance (ESG), Controls are the control variables, γ_t represents the time fixed effect, μ_i represents the individual fixed effect, $\varepsilon_{i,t}$ is the random error term of the model, and the parameter β reflects the impact effect of ESG performance on stock liquidity. In addition, the research model uses robust standard errors for regression.

5. Empirical Research and Result Analysis

5.1. Descriptive Statistics

Table 2 shows the descriptive statistics results. The mean of stock liquidity is -0.017, the minimum value is -0.037, and the maximum value is -0.003. Overall, there are large differences in liquidity among individual stocks in China's A-share market, and the overall liquidity level needs to be improved. The standard deviation of the sample companies' ESG performance is 1.104, the mean is 4.148, and the minimum and maximum values are 1 and 8, respectively. This indicates that the ESG performance of different enterprises varies, and the overall ESG performance of the sample enterprises is acceptable.

Table 2. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max	Variance
Liquidity	24,742	-0.017	0.077	-0.037	-0.003	0.006
ESG	24,742	4.148	1.104	1.000	8.000	1.218
Lev	24,742	0.415	0.197	0.052	0.902	0.039
Age	24,742	3.093	0.262	1.609	4.159	0.069
Top1	24,742	0.333	0.145	0.082	0.748	0.021
Cashflow	24,742	0.051	0.067	-0.173	0.267	0.004
ROE	24,742	0.061	0.135	-0.926	0.437	0.018
Outshare	24,742	0.788	0.245	0.037	1.000	0.060
Dual	24,742	0.303	0.460	0.000	1.000	0.211
BM	24,742	0.619	0.258	0.064	1.246	0.067

5.2. Multicollinearity Test

Since this paper selects many control variables related to corporate finance and characteristics, a multicollinearity test is conducted to ensure the accuracy of the regression analysis. The variance inflation factor test results in Table 3 show that the maximum VIF of all explanatory variables is 1.29, which is far lower than the usual critical value of 10, indicating that the model of this study is not subject to significant multicollinearity interference.

Table 3. Variance Inflation Factor of Explanatory Variables

Variable	ESG	Lev	Age	Top1	Cashflow	ROE	Outshare	Dual	BM
VIF	1.08	1.29	1.11	1.07	1.17	1.24	1.19	1.07	1.24
1/VIF	0.92	0.77	0.90	0.93	0.86	0.80	0.84	0.93	0.80

5.3. Benchmark Regression Result Analysis

Table 4 shows the benchmark regression results of corporate ESG performance on stock liquidity. Column (1) shows the impact of corporate ESG performance on stock liquidity without adding control variables and fixed effects. The results show that the regression coefficient of corporate ESG performance is 0.023, which passes the 1% statistical significance test. Column (2) adds industry and year fixed effects on the basis of column (1), and its significance remains unchanged. Column (3) incorporates the control variable set on the basis of column (2). The results show that the regression coefficient between corporate ESG performance and stock liquidity is 0.026, showing a significant positive correlation at the 1% level.

Table 4. Benchmark Regression Results

Variable	(1)	(2)	(3)
	Liquidity	Liquidity	Liquidity
ESG	0.023***	0.006***	0.026***
	(8.28)	(1.26)	(5.11)
Lev			0.066*
			(1.66)
Age			0.0078***
			(10.53)
Top1			-0.002**
			(-2.30)
Cashflow			0.196***
			(3.16)
ROE			-0.101***
			(-3.35)
Outshare			0.259***
			(11.53)
Dual			0.007
			(0.61)
BM			-0.113***
			(-3.92)
Cons	-0.167***	-0.167***	-0.351***
	(-14.16)	(-7.42)	(-7.77)
Individual FE	No	Yes	Yes
Year FE	No	Yes	Yes
N	24742	24742	24742

Note: ***, **, * represent significance at the 1%, 5%, and 10% levels, respectively; t-values are in parentheses.

5.4. Robustness Test

100.44.4. Replace Core Explanatory Variable

For the robustness of the conclusion, this paper uses a three-point system to reconstruct the indicator ESG1 (AAA-A is assigned a value of 3, BBB-B is assigned a value of 2, CCC-C is assigned a value of 1), and regresses model (3) again. The results are shown in Table 5 From column (1), it can be seen that after replacing the core explanatory variable, the regression coefficient of ESG1 is 0.004, which is significantly positive at the 1% level, meaning that better corporate ESG performance leads to higher stock liquidity.

5.4.2. Lagged Regression of Core Explanatory Variable

Current stock liquidity may reversely affect ESG performance. Therefore, this paper uses the corporate ESG performance lagged one period (ESG_lag) variable and regresses model (3) again. The regression results in column (2) of Table 5 show that the regression coefficient of ESG_lag is significantly positive at the 1% level.

5.4.3. Replace Core Explained Variable

This paper draws on existing literature and replaces the core explained variable with the Roll indicator to remeasure stock liquidity^[14]. The larger the value of this indicator, the stronger the stock liquidity, and the smaller the value, the weaker the stock liquidity. The regression results in column (3) of Table 5 show that the regression coefficient of ESG is significantly positive at the 1% level, with a coefficient value of 0.001, meaning that the improvement of corporate ESG performance has a significant enhancing effect on stock liquidity.

5.4.4. Adjust Sample Interval

Considering the potential impact of financial events such as the continuous decline in stock prices in 2015 and the outbreak of the COVID-19 epidemic in 2020 on individual stock liquidity, this paper removes the sample data of 2015 and 2020 and regresses model (3) again. The regression results in column (4) of Table 5 show that the ESG regression coefficient is significantly positive, indicating that after eliminating the impact, good corporate ESG performance can still significantly enhance stock liquidity.

Table 5. Robustness Test Results

Variable	(1)	(2)	(3)	(4)
	Liquidity	Liquidity	Liquidity	Liquidity
	Replace Explanatory	Lag Explanatory	Replace Explained	Adjust Sample
ESG1	0.004*** (6.27)			
ESG lag		0.003*** (11.60)		
ESG			0.001*** (8.39)	0.035*** (5.36)
Controls	YES	YES	YES	YES
Cons	-0.257*** (-4.77)	-0.048*** (-12.83)	0.104*** (100.44)	-0.321*** (-5.48)
Individual FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
N	24627	19833	24582	19199

Note: ***, **, * represent significance at the 1%, 5%, and 10% levels, respectively; t-values are in parentheses.

6. Research Conclusions and Recommendations

6.1. Research Conclusions

This paper uses a sample of China's Shanghai and Shenzhen A-share listed companies from 2015 to 2022 to explore the impact of ESG performance on stock liquidity. The research results show that good ESG performance has a significant positive impact on stock liquidity. After a series of robustness tests such as replacing the core explanatory variable, lagging the explanatory variable, replacing the core explained variable, and adjusting the sample interval, the above conclusion remains robust.

6.2. Relevant Recommendations

At the corporate level, enterprises should actively strengthen management in environmental, social, and corporate governance (ESG) aspects and promote the continuous development of enterprises towards sustainable development. To this end, enterprises must improve information transparency, disclose corporate ESG performance and initiatives in a timely manner, and enhance the trust of capital market investors in the enterprise. These measures can not only reduce the risks caused by information asymmetry but also attract more investors, thereby injecting more funds and resources into the sustainable development of enterprises.

At the government level, relevant departments can try to introduce some relevant policies to provide some subsidies for listed companies with good ESG performance and reduce some taxes paid by enterprises. At the same time, they can guide financial institutions to provide high-quality financing for enterprises with excellent ESG performance, lower financing thresholds, weaken corporate financing constraints, and further increase corporate stock liquidity.

At the institutional level, professional institutions and their analysts should play their role in information transmission and convey higher-quality and more authentic corporate ESG performance information to investors. In addition, ESG rating agencies need to establish a more complete ESG evaluation system and improve the quality of ESG information itself. The quality of ESG information directly affects stock liquidity and corporate financing costs. If the ESG information itself is unscientific and non-standard, it will reduce the confidence and motivation of corporate ESG practices, which is detrimental to the development of the entire market. So far, there is no authoritative ESG indicator in China that is fully recognized by researchers and market participants. Relevant rating agencies need to do further work in the popularization of ESG ratings and the improvement of their quality.

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