ESG and Corporate Financial Performance: The Mediating Role of Stock Liquidity

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Abstract. This study discusses the effect of ESG performance on corporate financial performance using a sample of Chinese non-financial listed companies from 2009 to 2021. Through empirical analysis from the standpoint of the external information environment, the study demonstrates that enhancing ESG performance leads to improved financial performance, and this relationship is mediated by stock liquidity. Moreover, the positive effect of ESG performance on financial performance is more pronounced in companies with a higher proportion of institutional investors' shareholding.

Keywords: ESG; Financial performance; Stock liquidity; Institutional shareholding

1 Introduction

In 1992, the United Nations Environment Program proposed the ESG plan to encourage financial institutions to incorporate environmental, social and governance factors into their business decision-making processes and lead the adoption of environmental protection and sustainable principles. At present, ESG performance has become an important reference for measuring the level of corporate sustainability, and it is of great significance to study its impact mechanism on corporate financial performance. While many scholars believe that improvements in ESG performance correspond to higher corporate performance, some scholars believe that there is no substantial connection between the two, and other scholars believe that ESG will harm corporate financial performance [1]. It can be seen that scholars have not yet clarified the relationship between ESG performance and corporate financial performance, especially the lack of research on its impact mechanism.

To address the above issue, we take Chinese non-financial listed companies from 2009 to 2021 as the sample and conduct an empirical study on the relationship between corporate ESG performance and financial performance from the perspective of the external information environment. Additionally, we examine the mediating role of stock liquidity and explore the moderating influence of institutional investors' ownership. This study mainly contributes to guiding companies to better implement ESG concepts, as well as to help investors in making more informed ESG assessments and enhancing their investment strategies.

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2 Hypothesis Development

Based on the stakeholder theory, we believe that corporate fulfillment of social responsibilities can not only establish a good social reputation, but also has long-term effects on consumers' willingness to purchase products [2], thereby improving corporate financial performance. There are also research indicates that institutional investors pay attention to a company's ESG performance when seeking investment opportunities, leading to specific preferences in stock holdings [3]. This also implies that ESG performance can enhance corporate financial performance.

Hypothesis 1: ESG performance has a positive impact on corporate financial performance.

Stock liquidity measures the reaction of external markets to a company's value. Research shows that there is an ESG risk premium in the market, and companies with higher ESG ratings exhibit higher excess stock returns [4], therefore, companies with better ESG performance may experience more active stock trading. Another research shows that stock liquidity has an information effect: the enhancement of stock liquidity increases the information content of stock prices [5], which in turn improves its financial performance by affecting cash flow and debt solvency [6].

Hypothesis 2: Stock liquidity mediates the relationship between ESG performance and corporate financial performance.

Institutional investors have strong analytical capabilities and financial resources, and can convey signals to the market about a company's operating conditions through research reports, shareholdings, and divestment actions [7, 8]. Corporate ESG performance, as important information for external judgments on the sustainability of corporate operations, can influence the market's evaluation of a company's future operations. Specifically, a higher shareholding ratio of institutional investors will strengthen the market's positive expectations for the future operations of companies with higher ESG ratings, thereby enhancing the effectiveness of corporate ESG performance and significantly improving corporate financial performance.

Hypothesis 3: Institutional investors' shareholding positively moderates the relationship between ESG performance and corporate financial performance.

3 Research Design

3.1 Data Source and Sample Selection

We use Chinese A-share listed companies from 2009 to 2021 as the research sample. ESG rating data is from the WIND database, while other financial data is from the CSMAR database. The following data processing steps were applied: (1) financial companies are dropped; (2) ST or *ST samples are dropped; (3) missing values of variables are dropped; (4) We conducted a 1% trim on the major continuous variables to address the influence of outliers. This process yielded a dataset comprising 26,984 valid samples.

Table 1 presents the main variables. Earnings per Share (EPS) is an important financial indicator that reflects a company's profitability from the perspective of shareholders and other

investors. Therefore, this study uses EPS to observe corporate *Financial performance*.

Following the method used by Gao, Chu [9] , we adopts the Huazheng ESG rating index to measure company *ESG performance*, where a higher rating indicates better ESG performance.

Stock liquidity (LIQ) refers to the ease with which a stock can be traded in large volumes quickly and at low cost in the securities market. Following Amihud [10] calculation method, this study calculates the stock illiquidity indicator (ILLIQ) based on the formula:

$$ILLIQ_{\mathrm{iy}} = 10^8 * 1/D_{iy}\sum_{t+1}^{D_{iy}}|R_{iyd}| \,/\, VOLD_{ivyd} \quad (1)$$

In the above equation, $D_{i,y}$ refers to the number of trading days for stock i in year y, R_{iyd} represents the daily return rate of stock i on the d trading day in year$y$, considering cash dividends reinvested; $VOLD_{ivyd}$ represents the daily trading volume in hundred million RMB for stock i on the d trading day in year y. The higher the value of ILLIQ, the greater the impact of unit trading amount on stock prices, leading to higher trading costs for investors and lower stock liquidity. In this study, stock liquidity is measured using the inverse of the illiquidity indicator, and a higher LIQ value indicates higher stock liquidity for the company.

Table 1. Main Variables

Variable	Symbol	Measurement
Financial Performance	EPS	Earnings per share, net profit/total shares
ESG Performance	ESG	Assigned values from 1 to 9 based on CICC ESG rating
Stock Liquidity	LIQ	Negation of the non-liquidity index obtained from Model (1)
Institutional Shareholding	$INST$	Institutional investor shares held/total shares
Company Age	Age	the company's establishment period
Financial Leverage	Lev	total assets/ total liabilities
Market Value	$TobinQ$	total market value/assets
Cash Flow	$Cash$	operating cash flow/assets
Revenue Growth	$Growth$	Company revenue growth rate
CEO Duality	$Dual$	If the Chairman is also the CEO, then value is 1, otherwise, 0
Board Size	$Board$	Ln (the number of directors)

3.2 Model Specification

To investigate the impact of corporate ESG performance on financial performance, the basic regression model is specified as follows:

$$EPS_{i,t} = \alpha_0 + \alpha_1 ESG_{i,t} + \sum Controls_{i,t} + \sum Year + \sum Industry + \varepsilon_{i,t} \quad (2)$$

$Controls$ represents the control variables, and ε is the random error term in the model. α_1 reflects the change in EPS before and after the variation in ESG performance of the company. we use a fixed effects regression model with fixed years and industries.

To examine the mediating effect of stock liquidity (LIQ) in the above relationship, we adopt the approach of Wen and Ye [11] and sets the following model for testing.

$$EPS_{i,t} = \varphi_0 + \varphi_1 ESG_{i,t} + \sum Controls_{i,t} + \sum Year + \sum Industry + \varepsilon_{i,t} \quad (3)$$

$$LIQ_{i,t} = \beta_0 + \beta_1 ESG_{i,t} + \sum Controls_{i,t} + \sum Year + \sum Industry + \varepsilon_{i,t} \quad (4)$$

$$EPS_{i,t} = \varphi'_0 + \varphi'_1 ESG_{i,t} + \varphi'_2 Mediator_{i,t} + \sum Controls_{i,t} + \sum Year + \sum Industry + \varepsilon_{i,t} \quad (5)$$

We introduce the proportion of institutional shareholding and the interaction term between ESG and institutional shareholding to explore the moderating effect in model (6):

$$EPS_{i,t} = \phi_0 + \phi_1 ESG_{i,t} + \phi_2 INST_{i,t} + \phi_3 ESG_{i,t} \times INST_{i,t} + \sum Controls_{i,t} + \sum Year + \sum Industry + \varepsilon_{i,t} \quad (6)$$

In the equation, the coefficient $\emptyset_2$ of $INST$ represents the level of institutional investors' shareholding. The coefficient $\emptyset_3$ of the interaction term $ESG \times INST$ is used to measure the extent of the impact of institutional investors' shareholding on ESG, to test Hypothesis 3.

3.3 Descriptive Statistics

Table 2 presents the descriptive statistics for the main variables. The mean ESG rating is 4.08, suggesting that the average ESG rating of the companies falls between the B and BB levels.

Table 2. Descriptive Statistics

Variable	N	Mean	SD	Min	p25	p50	p75	Max
EPS	26984	0.37	0.56	-1.42	0.09	0.28	0.57	2.69
ESG	26984	4.08	1.02	1.00	3.50	4.00	5.00	8.00
LIQ	26984	-0.05	0.06	-0.34	-0.07	-0.04	-0.02	0.00
INST	26984	0.45	0.24	0.00	0.26	0.47	0.64	0.91
Age	26984	17.36	5.63	5.00	13.00	17.00	21.00	32.00
Lev	26984	0.44	0.21	0.05	0.27	0.43	0.59	0.94
TobinQ	26984	2.09	1.38	0.87	1.25	1.64	2.38	9.03
Cash	26984	0.05	0.07	-0.16	0.01	0.05	0.09	0.25
Growth	26984	0.18	0.45	-0.57	-0.03	0.10	0.26	3.02
Dual	26984	0.26	0.44	0.00	0.00	0.00	1.00	1.00
Board	26984	2.14	0.20	0.00	1.95	2.20	2.20	2.89

4 Empirical Results and Analysis

4.1 2SLS Regression Results

To mitigate the endogeneity problem, we follow the method of Fisman and Svensson [12] by using the average ESG performance of peer companies within the same region and industry as an instrumental variable and we use two-stage least squares (2SLS) method to test result. First Stage in Table 3 indicates that the average ESG performance of peer company is a valid instrument ($b = 0.940$, $p < 0.01$). Second Stage indicating that after solving the endogeneity problem, ESG performance still has a significant positive impact on EPS ($b = 0.167$, $p < 0.01$). The results confirm Hypothesis 1.

Table 3. ESG and Financial Performance: 2SLS Regression Result

DV=EPS	First Stage	Second Stage
ESG		0.167***
		(22.59)
Instrument	0.940***	
	(77.31)	
Age	-0.004***	-0.000
	（-3.28）	（-0.16）
Lev	-0.468***	-0.225***
	（-15.98）	（-12.94）
	-0.078***	0.017***

TobinQ	（-17.76）	（6.63）
	0.954***	2.096***
Cash	（11.89）	（44.50）
	-0.023*	0.239***
Growth	（-1.94）	（35.09）
	-0.074***	0.027***
Dual	（-5.87）	（3.78）
	0.134***	0.148***
Board	（4.78）	（9.19）
	0.281***	-0.851***
Cons	（2.64）	（-13.74）
	-0.004***	-0.000
Industry, Year	Yes	Yes
N	26984	26984
adj.R^2	0.285	0.228

t statistics in parentheses, * p < 0.1, ** p < 0.05, *** p < 0.01

4.2 Testing the Mediating Effect of Stock Liquidity

Column (1) in Table 4 shows the benchmark regression of ESG on EPS, and column (2) suggests that the improvement of ESG enhances stock liquidity (LIQ). Column (3) presents the regression results for ESG (b = 0.110, p < 0.01) and stock liquidity (b = 1.622, p < 0.01), which indicates that good ESG performance contributes to higher stock liquidity, and then the increase in stock liquidity has enhanced the financial performance, hypothesis 2 is confirmed.

Table 4. Mediation Effects of Stock Liquidity

	(1)	**(2)**	**(3)**
ESG	0.124^{***}	0.009^{***}	0.110^{***}
	(39.39)	(28.34)	(34.83)
LIQ			1.622^{***}
			(26.28)
Cons	-0.525^{***}	-0.146^{***}	-0.289^{***}
	(-13.33)	(-37.90)	(-7.24)
Controls, Industry, Year	Yes	Yes	Yes
adj.R^2	0.285	0.228	0.285
N	26984	26984	26984

t statistics in parentheses, * p < 0.1, ** p < 0.05, *** p < 0.01

4.3 Moderating Effect of Institutional Shareholding

Table 5 indicates that institutional investors' shareholding positively moderates the positive effect of ESG performance on EPS (b = 0.049, p < 0.01). As the proportion of institutional investors' shareholding increases, the promotion effect of corporate ESG performance on financial performance strengthens, which supports Hypothesis 3.

Table 5. Moderation Effects for Institutional Shareholding

DV=EPS	**(1)**	**(2)**
ESG	0.116^{***}	0.116^{***}
	(37.20)	(37.22)

INST	0.372***	0.368***
	(26.96)	(26.57)
ESG×INST		0.049***
		(3.86)
Cons	-0.500***	-0.497***
	(-12.87)	(-12.79)
Controls, Industry, Year	Yes	Yes
adj.R^2	0.251	0.251
N	26983	26983

t statistics in parentheses, * p < 0.1, ** p < 0.05, *** p < 0.01

5 Conclusion and Implications

We examined the impact of corporate ESG performance on financial performance based on Chinese listed company data and came to the following conclusions: First, there is a significant positive relationship between ESG performance and firm financial performance. Secondly, we find that stock liquidity plays a positive mediating role between ESG performance and financial performance. Finally, the increase in the institutional shareholding amplifies the positive impact of ESG performance on financial performance, which means institutional investors actively play a role in information transmission.

Overall, we highlight the importance of ESG performance to a company's financial performance and provide insights into the influential mechanisms, and our findings provide important implications for managers, policymakers and investors.

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