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Empirical Study on ESG Information Disclosure Quality, Professional Institution Attention, and Corporate Performance

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Abstract

As global environmental issues continue to deepen, people are paying more attention to sustainable development, and as a result, ESG concepts are becoming increasingly popular. In terms of enterprises, stakeholders not only focus on financial indicators, but also pay attention to the effectiveness of ESG in enterprises. It can be seen that the quality of ESG information disclosure of enterprises cannot be underestimated in terms of their performance. This paper mainly takes A-share listed companies from 2011 to 2022 as the research object, removes outliers, and finally obtains 32531 sample data. The main focus is on whether the quality of ESG information disclosure has an impact on corporate performance, and empirical research is conducted using professional institution attention as a mediating variable between the two. Research has found that the quality of ESG information disclosure is negatively correlated with corporate performance to a certain extent, and shows a positive correlation after exceeding the threshold. By analyzing the attention of professional institutions into two dimensions: analyst attention and research attention, the study found that professional institution attention plays a mediating role, and companies in the growth stage receive higher attention from professional institutions. In order to ensure the robustness of the conclusion, this article regresses the variable ESG lagged by one period and uses the price to book ratio PB as a substitute for the TobinQ of corporate performance, and concludes that the conclusion is still robust. Based on heterogeneity, the impact between the two is more significant in non-state-owned enterprises.

Keywords

ESG Information Disclosure Quality; Attention from Professional Institutions; Corporate Performance; Mediation Effect.

1. Introduction

In the context of economic globalization, the global economy has shifted towards high-quality development. The previous extensive economic development has brought various crises to the world today, among which the ecological crisis is the most severe. The concept of "green economy" has been circulating in some developed countries in Europe since 1970, and after decades of development, concepts such as green finance have emerged. Corporate stakeholders no longer solely focus on the profitability of the enterprise, but also pay attention to the ecological profitability of the enterprise, the assumption of corporate public welfare responsibilities, and so on.

The ESG concept is an innovative theory derived from this. The so-called ESG, namely: E-Environment environmental responsibility; S-Social social responsibility; G-Governance governance. With the increasing maturity of information disclosure behavior, people have also seen the important value of ESG information disclosure, and stakeholders are paying more attention to ESG information. In summary, the study on the relationship between ESG

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information disclosure quality and corporate performance, with professional institution attention as a mediating variable, has certain practical significance for corporate development.

This article adopts literature research and empirical research methods to explore how the quality of ESG information disclosure affects corporate performance. Continuing with the introduction of the mediating variable of professional institution attention, the attention of professional institutions is decomposed into analyst attention and research attention, mainly analyzing the impact of ESG information disclosure quality on professional institution attention, and elaborating on the mediating effect of professional institution attention on the relationship between ESG information disclosure quality and corporate performance. Based on theory, make assumptions, select variables, and construct models. To examine the relationship between the quality of ESG information disclosure, the attention of professional institutions, and corporate performance, in order to draw the final conclusion.

In current research on the quality of ESG information disclosure, there is relatively little literature on the relationship between ESG information disclosure quality and corporate performance, with professional institutional attention as a mediating variable. Because most literature studies the focus on a single mediator variable, this article divides the attention of professional institutions into two dimensions: analyst attention and research attention. In addition, the vast majority of scholars analyze the impact of ESG on corporate performance from individual factors, while this article studies the impact of ESG on corporate performance as a whole. Unlike previous studies where most scholars only explored the positive or negative effects of ESG information disclosure quality on corporate performance, this article comprehensively considers the role of ESG information disclosure quality on corporate performance and proposes that it will exhibit a U-shaped relationship, which has been rarely studied in previous literature..

2. Journals Reviewed

2.1. Research on the Impact of ESG Information Disclosure Quality on Corporate Performance

2.1.1. A Study on the Positive Effect of ESG Information Disclosure Quality on Corporate Performance

ESG provides information related to the daily operations of a company from three perspectives: environmental (E), social (S), and corporate governance (G). Xu Xuegao and Wang Zhibin (2022) found that in the future, if ESG information disclosure can increase quantitative data instead of a large amount of purely textual descriptions, then ESG disclosure will have the significance of reflecting the actual situation of the company, and third-party ESG rating agencies can also objectively and fairly evaluate it. ESG disclosure quality refers to the use of quality evaluation models to measure ESG disclosure indicators. The better the performance of ESG, the higher the quality of ESG information disclosure.

The concept of ESG has developed earlier in foreign countries, and most research conclusions in the academic community abroad tend to indicate a positive impact between the two. As Velte P (2017) found, ESG can significantly improve asset returns, and corporate governance indicators have a significantly higher impact on financial performance than environmental governance and social responsibility. Patel Pankaj C et al. (2021) found that although industry ESG sales vitality and predictability reduce firms' implied volatility, higher enterprise level ESG ratings slow down the decline in implied volatility with increased ESG sales vitality.

Domestic scholars started their research in related fields relatively late. Qiu Muyuan and Yin Hong (2019) found that companies with good ESG performance have significantly reduced financing costs, and the quality of information disclosure plays a significant role. Xu Wenjing et

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al. (2022) used the total asset net profit margin as a proxy variable for corporate performance and empirically found that carbon information disclosure can significantly improve a company's financial performance by reducing financing costs, and the degree of impact is positively correlated with disclosure quality.

2.1.2. A Study on the Negative Effects of ESG Information Disclosure Quality on Corporate Performance

Some scholars argue that there is a negative correlation between the two. For example, Garcia S A et al. (2017) selected data from 365 listed companies in the BRICS countries to study the relationship between ESG and financial performance. The analysis showed that the profitability of corporate assets was only negatively correlated with the level of environmental information disclosure, and the companies with the best ESG performance had lower profits. Similarly, Wang Rong (2022) found a U-shaped relationship between ESG information disclosure and corporate value. In the short term, ESG information disclosure reduces corporate value, while in the long term, ESG information disclosure enhances corporate value. Crifo P et al. (2015) proposed a unique framework experiment to explore the impact of ESG disclosure on equity financing, and found that non-financial (ESG) performance disclosure of companies affects company valuation and investment decisions, with investors having a greater response to adverse ESG disclosure.

2.1.3. A study on the insignificant impact of ESG information disclosure quality on corporate performance

Aupperle K E et al. (1985) established the same period and lagged 5-year ROA indicators as explanatory variables in their empirical study, and verified that corporate social responsibility is not correlated with financial performance. Subsequently, scholars Richardson A J et al. (1999) designed an analytical model to discuss the relationship between social responsibility performance and cash flow, and found no significant relationship between the two variables. Rathner S (2013) introduced a sample of American companies to discuss the impact of ESG on financial performance, which is both positive and negative, and there is no unified theory yet. Chen Yuqing and Ma Lili (2005) used accounting theory to discuss the relationship between social responsibility and corporate performance, and the results showed no significant correlation between the two.

2.2. Research on the Attention of Professional Institutions

As a bridge connecting enterprises and external stakeholders, the transmission of enterprise information cannot be separated from the role of professional institutions. Professional institutions can have an impact on the behavior and performance of enterprises. It can be said that professional institutions are important intermediaries between the quality of ESG information disclosure and corporate performance.

Professional institutions' attention will have an impact on corporate behavior. As Wang Susheng et al. (2014) found, in China's securities market, analysts have an external supervision effect, that is, their attention will suppress the degree of earnings manipulation by management, thereby reducing agency costs and enhancing company value. Xie Zhen et al. (2014) found that analysts' focus on putting pressure on management led to a reduction in R&D investment, resulting in a short-sighted effect. Many scholars have also explored the role of media attention. Ying Qianwei et al. (2017) found that while the media plays the role of "supervisors", it creates market pressure on corporate managers, which exacerbates their short-sighted behavior. Yang Dan et al. (2015) found that media coverage of companies induces managers to pay more attention to short-term performance and engage in short-sighted behavior. Tan Yuanyuan (2021) found that online media attention can improve corporate environmental governance behavior and promote green innovation.

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The attention of professional institutions can also lead to changes in stock liquidity. As Wang Yanyan et al. (2014) found, non-financial information in social responsibility reports released by Chinese companies can attract analysts' attention and improve the information environment of the capital market. For example, Chen M et al. (2023) analyzed the positive impact of ESG disclosure on stock liquidity through Chinese listed companies: this impact shows significant heterogeneity in terms of company industry, ownership, and location; The disclosure of ESG by enterprises has attracted more institutional investors to participate, thereby improving stock liquidity.

2.3. Literature Review

From a comprehensive review of existing literature, it can be found that firstly, there are not many studies on the quality of ESG information disclosure at present. Most of the literature focuses on the study of corporate value from the perspectives of environmental information disclosure, social responsibility information disclosure, and corporate governance. A small number of literature combines ESG and ESG to study the relationship between them and corporate performance. Secondly, there are currently few scholars studying the role of professional institutional attention in the impact of ESG information disclosure quality on corporate performance. Therefore, this article first includes the intermediary variable of professional institution attention, and then further decomposes it into two dimensions: analyst attention and research attention. Attempting to explore the mediating role of analyst attention and research attention in the relationship between ESG information disclosure quality and corporate performance from the perspective of professional institution attention.

3. Theoretical Analysis and Research Hypotheses

3.1. Theoretical Analysis

3.1.1. Stakeholder Theory

This theory mainly refers to the enterprise of stakeholders. Any group that bears the operational risks of a company can be referred to as stakeholders to a certain extent. It is reasonable to use this theory as the theoretical basis for ESG information disclosure. On the one hand, for internal stakeholders of the enterprise, such as employee management, they hope to have a comfortable and safe working atmosphere, so that they can work hard, improve their enthusiasm, and enhance the performance of the enterprise. On the other hand, for external stakeholders of the enterprise, such as customers and the government. Firstly, through ESG information disclosure, the company demonstrates its commitment to a green and sustainable development strategy, which can to some extent increase customer favorability and enhance customer stickiness. Secondly, by fulfilling corporate social responsibility and contributing to sustainable development, policy support can also be obtained to reduce financing costs.

3.1.2. Asymmetric Information

The theory of information asymmetry refers to the different positions of two parties in market transactions. People who have a more detailed understanding of information will have a greater advantage compared to the other party. Asymmetric information generally triggers two problems: moral hazard and adverse selection. The former refers to information advantaged individuals who, in order to maximize their own interests, are willing to violate market rules and disrupt the balance of the capital market. This term originates from the insurance industry, and the most classic example is that people who have purchased insurance will change their behavior. Subsequently, it evolved into managers sacrificing the interests of stakeholders in order to maximize their own interests. Adverse selection refers to the situation where the party with more information will hide their own information during the transaction, harming the interests of the other party in order to achieve their own gains.

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By disclosing ESG information, companies can narrow the information gap with stakeholders, thus to some extent, the two issues mentioned above can be appropriately alleviated. ESG information disclosure provides non-financial information, mainly divided into three aspects: E environment, S social responsibility, and G governance, making corporate information more open and transparent, which will make managers more constrained and reduce moral hazard issues. On the other hand, various sectors of society will also compare companies' ESG information disclosure quality as a standard to reduce the problem of adverse selection. In addition, disclosing ESG information by enterprises can reduce the cost of collecting information for investors and creditors, improve the accessibility of corporate funds, and contribute to the improvement of corporate performance.

3.1.3. Sustainable Development Theory

In order to emphasize that progress cannot come at the expense of future generations, the United Nations released the report "Our Common Future" in 1987, which first proposed this theory. Subsequently, some scholars applied it to business, which means that companies need to prioritize both financial and environmental performance in order to meet sustainability requirements. Taking into account both environmental solutions and social value, seeking a balanced development between the economy and natural ecology, and striving for sustainable development, is the foundation for the long-term development of enterprises and even for the long-term development of humanity. Therefore, sustainable development theory can be regarded as the theoretical basis for ESG information disclosure.

3.2. Research Hypothesis

3.2.1. The Impact of Information Disclosure Quality on Corporate Performance

During a longer period of survival, enterprises will be divided into different life cycles, including four stages: start-up stage, growth stage, maturity stage, and decline stage. The ESG performance of enterprises in different life cycles will also have different impact effects on their performance. With the prevalence of ESG concepts, when companies engage in ESG information disclosure in order to meet current development trends and strive to improve its quality, it will inevitably increase their operating costs, as fulfilling social responsibility is also a cost. If companies want to improve the quality of information disclosure and enhance ESG performance, it will to some extent be detrimental to their digitalization and financialization, especially for companies in heavily polluting industries. So it is preliminarily speculated that increasing the quality of ESG information disclosure by companies may lower their corporate performance. For managers, some who are more concerned about the short-term financial performance of the company may have a short-sighted view, believing that a large amount of ESG investment cannot bring good financial performance to the company, but will instead reduce the company's cash flow, exacerbate the company's cost dilemma, and thus be unwilling to invest too much ESG cost. Enterprise managers often believe that taking on social responsibility is an act of agency that harms the interests of shareholders for personal gain. Due to information asymmetry between shareholders and managers, as well as opportunistic tendencies of managers, there exists a conflict of interest between the two. Managers may invest excessive resources into ESG practices in order to gain higher reputation and personal benefits, leading to a decrease in the company's profitability and an increase in operational risks. Generally speaking, maximizing shareholder wealth is the primary goal of business operations, and corporate social responsibility and improving ESG performance do not align with the goal of maximizing shareholder wealth. The resources of a company are limited. If resources are invested in improving ESG performance, it will prevent limited resources from being invested in projects that create wealth for shareholders, resulting in a decrease in the company's competitiveness, an increase in the likelihood of operational risks, and damage to the company's value. In addition, due to the inconsistency between the goals of investors and

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investees, investors may have a high degree of suspicion towards companies engaging in ESG activities, which in turn increases the risk level faced by companies with good ESG performance. Therefore, from the perspective of short-term benefits, improving the quality of information disclosure does not bring benefits to corporate performance, but rather increases operational costs and reduces corporate performance.

However, according to the theory of information asymmetry and stakeholder theory, the demands of all stakeholders need to be considered, but compared to the initial focus on financial indicators, it is far from enough. With the gradual prevalence of ESG theory, the importance of non-financial indicators has gradually become prominent, and companies' disclosure of ESG information can increase the disclosure of non-financial information. Common stakeholders typically include shareholders, creditors, corporate employees, government, and the public, among others. By improving the quality of ESG information disclosure, company shareholders can observe the company's achievements in ESG, observe whether they are consistent with current development trends, and whether they can create greater benefits for shareholders, thereby deciding whether to increase investment. When shareholders decide to increase investment, it will inevitably further improve the performance of the company. From the perspective of debtors, they also hope that companies can disclose ESG information and improve the quality of ESG information disclosure. When companies move towards a green and sustainable development path, this can make their survival more stable, reduce operational risks, and prevent them from easily becoming insolvent. Their debts can also be guaranteed. For company employees, if the company actively engages in ESG and improves the quality of its ESG information disclosure, they will determine that their company has a sense of social responsibility, shape a better corporate culture, further improve employee satisfaction, reduce turnover rates, attract more and more outstanding talents to join the company, thereby helping the company create greater value and enhance its performance. For the government, if companies improve the quality of their ESG information disclosure, it can drive further improvement of China's ESG information disclosure system. For the public, the improvement of ESG information disclosure quality will weaken the role of information asymmetry, thereby enhancing the public's favorability and willingness to buy the company's products, which will help improve the company's performance.

In summary, it is preliminarily speculated that when companies begin to increase the quality of their ESG information disclosure, their performance will first show a downward trend with the increase of costs. However, as their investment in ESG information disclosure quality continues to increase, the benefits obtained by the company will gradually cover their initial costs, reaching a balance point, and ultimately improving their performance.

Therefore, this article concludes that there is a U-shaped relationship between the quality of ESG information disclosure and corporate performance.

3.2.2. The Mediating Effect of Attention from Professional Institutions

Professional institutions are an important part of the market and can play a complementary role in non efficient markets, thereby effectively reducing information asymmetry. Enterprises disclose ESG information, but when they are in the growth stage, professional institutions will focus on such enterprises in order to reduce information asymmetry. However, as the quality of ESG information disclosure gradually improves, professional institutions will begin to reduce their attention to such enterprises and maintain trust in them. By serving as a bridge between businesses and consumers through professional institutions, it can to some extent serve as a means of supervision. Its interpretation and transmission of information reduce the impact of information asymmetry and delay the potential lag effect of ESG information disclosure quality on corporate performance due to information transmission, indirectly promoting the impact of ESG information disclosure quality on corporate performance. Not only that, professional

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institutions can more objectively, specifically, and truthfully convey ESG information to consumers, so that consumers can compare which companies can actively undertake social responsibility. Consumers also have a better impression of companies with higher quality ESG information disclosure, subjectively believing that these companies will provide higher quality and greener products, and are more willing to purchase these products, ultimately contributing to the improvement of company performance. Therefore, this article proposes hypothesis H2:

H2: Professional institutions focus on the mediating role of ESG information disclosure quality on corporate performance, and companies in the growth stage receive higher attention from professional institutions.

However, due to the overly broad definition of professional institutions and the use of analysts as intermediaries for corporate information by Zhang Chun et al. (2009) , it was found that a higher level of corporate information disclosure would attract more analysts' attention. More analysts' attention would improve the quality of information disclosure, thereby improving the efficiency of corporate investment and curbing overinvestment behavior, promoting the increase of corporate value.

So this article makes the first sub assumption:

H2a: Analyst attention plays a mediating role in the impact of ESG information disclosure quality on corporate performance, and companies in the growth stage receive higher analyst attention.

Chen Xichan (2018) used data from listed companies from 2013 to 2014 and found that corporate ESG information disclosure has a positive effect on a company's ROA, ROE, and TobinQ. The media is beneficial in strengthening the relationship between corporate ESG information disclosure and corporate value. For the sake of robustness, Guan Shengdong (2024) does not use a single variable and instead uses two indicators, namely the attention of the analyst and the attention of the research institute, as measures of the attention of professional institutions.

Based on this, this article makes the second sub hypothesis:

H2b: The level of research attention plays a mediating role in the impact of ESG information disclosure quality on corporate performance, and companies in the growth stage receive higher levels of research attention.

In summary, this article divides the attention of professional institutions into two dimensions, namely analyst attention and research attention. On the basis that the hypotheses H2a and H2b are simultaneously proven, H2 holds true.

4. Research Design

4.1. Sample Selection and Data Sources

Using all A-share listed companies from 2011 to 2022 as the initial research sample, conduct the study with annual data and screen the research sample: (1) exclude samples from the financial industry. (2) Exclude samples of ST, SST, * ST, and PT categories. (3) Exclude samples with missing or outlier values in the relevant variables. The final result is a non-equilibrium panel data consisting of 32531 observations from "Enterprise Year".

The relevant data are all sourced from Guotai An. To mitigate the impact of outliers, Winsorize was applied to the first 1% of all continuous variables. The analysis and processing of data are completed through Stata 17.0 and Excel.

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4.2. Variable Definition

4.2.1. Explained Variable

Corporate performance: TobinQ is an indicator primarily used to measure a company's market value and business performance. The higher it is, the more optimistic the company's prospects are.

4.2.2. Explanatory Variables

ESG information disclosure quality: This article adopts Huazhong ESG rating, which divides ESG rating into 9 levels from excellent to poor (AAA-C), with a score of 9-1 from high to low. It draws on the mainstream international ESG evaluation framework, based on the reality of China's capital market and the characteristics of various listed companies, and finally determines 26 key indicators and over 130 sub indicators. Among the existing ESG rating systems for listed companies in China, the CSI system is relatively excellent in terms of evaluation breadth and depth.

4.2.3. Mediating Variables

Attention of professional institutions: Based on the analysis above, this article divides the attention of professional institutions into two dimensions: analyst attention and research attention.

4.2.4. Control Variables

As shown in the variable definition table. The variables used in this article are shown in Table 1.

Table 1. Variable Definition Table

Type of variable	Variable name	Variable symbol	Variable-definition
explained variable	Corporate performance	TobinQ	(Ending market value of tradable equity + ending market value of non-tradable equity + ending market value of net debt)/ending total assets
explanatory variable	Quality of ESG information disclosure	ESG	Huazheng ESG rating
metavariable	Analyst attention	Fenxishi	Analysts track the number of analysts using a logarithmic treatment plus 1
	Pay attention to the research report	Yanbao	The number of reports tracked by the research report is measured by adding 1 and logarithmic processing
controlled variable	company size	Size	Natural logarithm of total assets at the end of the period
	asset-liability ratio	Lev	Total liabilities at the end of the year / total assets at the end of the year
	enterprise age	Age	Take the logarithm of the age of the company
	Ratio of total assets to cash	Cashflow	Net cash flow for the period / total assets at year-end
	fixed assets ratio	Fixed	Fixed assets/total assets
	Shareholding ratio of the largest shareholder	TOP1	Number of shares held by the largest shareholder / total number of shares × 100
	Board independence	Indep	Number of independent directors / number of board members x 100
	Enterprise growth	Grouth	Growth rate of main business revenue

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4.3. Model Building

The bidirectional fixed effects model effectively overcomes endogeneity bias caused by omitted variables and eliminates the interference of annual macro environmental changes. Therefore, this article constructs bidirectional fixed effects model 1 for testing. Based on the previous assumptions, this article refers to the method of Haans J F R et al. (2016) to construct a regression model, and the coefficients α 1 and α 2 reveal the relationship between the two. If the regression coefficient α 1 of ESG is significantly negative, while the regression coefficient α 2 of ESG2 is significantly positive, it indicates the existence of a U-shaped relationship. The ESG score of a company is negatively correlated with its performance to a certain extent, and after exceeding the threshold, the quality of ESG information disclosure is positively correlated with its performance.

The specific model formula is as follows:

$$TobinQ_{i,t} = \alpha_0 + \alpha_1 ESG_{i,t} + \alpha_2 ESG^2_{i,t} + \sum \alpha \times Controls + \sum company + \sum year + \varepsilon_{i,t} \quad (1)$$

i and t are the number of enterprises and the year, respectively; Company and year are fixed effects at the enterprise and year levels, respectively; $\varepsilon_{i,t}$ represents the residual term.

5. Empirical Analysis

5.1. Descriptive Statistics

To gain a preliminary understanding of the characteristics of variables, this section provides detailed descriptions of each variable, as shown in Table 2.

Table 2. Descriptive Statistics of Main Variables

Variable	N	Mean	p50	SD	Min	Max
TobinQ	32531	1.960	1.603	1.167	0	7.351
ESG	32556	4.234	4	1.019	1	8
Size w	32531	22.18	21.96	1.293	20.07	26.34
Lev w	32531	0.398	0.391	0.197	0.0490	0.839
FirmAge	32531	2.866	2.890	0.349	1.792	3.526
Cashflow	32531	0.0500	0.0490	0.0670	-0.142	0.240
FIXED	32531	0.204	0.173	0.152	0.00300	0.674
Top1	32531	34.45	32.33	14.85	8.599	74.57
Indep	32531	37.59	36.36	5.291	33.33	57.14

From this, it can be seen that there are significant differences in corporate performance among different enterprises in China's capital market, as the difference between the maximum and minimum values of TobinQ is 7.351, and the standard deviation is 1.167. The difference between the maximum and minimum values of ESG is 79, indicating that there are significant differences in ESG ratings among different companies. Other research data is basically consistent with existing studies.

5.2. Correlation Analysis

By conducting correlation analysis, this study aims to evaluate the degree of association between variables and explore potential multicollinearity barriers. According to Table 3. The absolute values of the observed correlation coefficients for each variable do not exceed 0.55,

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indicating that the model has not been significantly affected by multicollinearity, thus ensuring the stability and credibility of the regression model.

To further enhance the robustness of the model, this study used variance inflation factor (VIF) for in-depth analysis, and the results are shown in Table 4. The VIF values did not exceed 5, indicating that there was no significant collinearity issue between the model and its variables, ensuring the reliability of the research results.

Table 3. Pearson correlation analysis

Variables	TobinQ	ESG	Size	Lev	Age	FIXED	Top1	Indep	Growth
TobinQ	1.000								
ESG	-0.050***	1.000							
Size	-0.312***	0.480***	1.000						
Lev	-0.285***	0.096***	0.550***	1.000					
FirmAge	-0.054***	0.376***	0.204***	0.163***	1.000				
FIXED	-0.094***	0.010	0.122***	0.105***	0.014***	1.000			
Top1	-0.090***	-0.006	0.177***	0.046***	-0.118***	0.108***	1.000		
Indep	0.030***	0.094***	0.009	-0.013**	0.002	-0.053***	0.046***	1.000	
Growth	0.093***	0.006	0.057***	0.066***	-0.069***	-0.035***	-0.008	-0.003	1.000

Table 4. Variance Inflation Factor (VIF) Analysis

Variable	VIF
Size	2.61
Lev	2.52
FirmAge	1.44
FIXED	1.68
Top1	1.52
Indep	1.51
Growth	1.14
Size	1.92
Lev	1.21
Mean VIF	1.72

5.3. Principal Regression Analysis

According to the established model analysis, see Table 5. It was found that there is a U-shaped relationship between ESG and corporate performance. Specifically, the impact of ESG on corporate performance is initially negative (negative regression coefficient), but when the quality of ESG information disclosure exceeds a certain threshold, its impact on corporate performance turns positive (positive ESG2 regression coefficient), and this change reaches a statistically significant level of 1%. This result supports the initial hypothesis that there is a periodic positive and negative correlation between ESG information disclosure and corporate performance. Thus, H1 is proven.

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Table 5. Benchmark Regression Results

Variable	(1)
	TobinQ
ESG	-0.2036***
	(-4.6166)
ESG2	0.0227***
	(4.1184)
Size	-0.2222***
	(-18.0407)
Lev	-0.7809***
	(-10.1256)
FirmAge	0.0537
	(1.4079)
Cashflow	2.8677***
	(14.7851)
FIXED	-0.6670***
	(-9.1232)
Top1	-0.0033***
	(-4.0181)
Indep	0.0065***
	(3.2521)
Growth	0.3841***
	(15.8521)
_cons	7.2854***
	(25.0735)
N	32531
r2_a	0.2308

5.4. Mechanism Verification

According to the previous assumption, the impact of ESG information disclosure quality on corporate performance may be achieved by influencing the attention of professional institutions. Therefore, this article refers to the mediation effect testing procedure proposed by Wen Zhonglin (2004), and constructs the following model to test the mediation effect of ESG information disclosure quality on corporate performance, where reports represent analyst attention and research attention, respectively. The model is as follows:

$$TobinQ_{i,t} = \alpha_0 + \alpha_1 ESG_{i,t} + \alpha_2 ESG^2_{i,t} + \sum \alpha \times Controls + \sum company + \sum year + \varepsilon_{i,t}$$

$$report_{i,t} = \alpha_0 + \alpha_1 ESG_{i,t} + \alpha_2 ESG^2_{i,t} + \sum \alpha \times Controls + \sum company + \sum year + \varepsilon_{i,t}$$

$$TobinQ_{i,t} = \alpha_0 + \alpha_1 ESG_{i,t} + \alpha_2 ESG^2_{i,t} + report_{i,t} + \sum \alpha \times Controls + \sum company + \sum year + \varepsilon_{i,t}$$

As shown in Table 6, the second column indicates that the quality of ESG information disclosure can have an impact on analyst attention, and presents an inverted U-shaped effect, that is, when the quality of ESG information disclosure of a company gradually increases, that is, when it is in the growth stage, analyst attention gradually increases, but when the company is in the mature stage, analyst attention gradually decreases. The third column indicates that there is a mediating effect of analyst attention between the explanatory variable and the dependent variable. H2a is certified.

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Table 6. Intermediary test of analyst attention

Variable	(1)	(2)	(3)
	TobinQ	fenxishi	TobinQ
ESG_2	-0.2036***	0.1866***	-0.2381***
	(-4.6166)	(6.5043)	(-5.5950)
ESG_22	0.0227***	-0.0061*	0.0216***
	(4.1184)	(-1.7371)	(4.1218)
fenxishi			0.3148***
			(28.4531)
Size	-0.2222***	0.4320***	-0.3671***
	(-18.0407)	(77.4992)	(-30.5397)
Lev	-0.7809***	-1.0485***	-0.3851***
	(-10.1256)	(-29.5216)	(-5.2776)
FirmAge	0.0537	-0.9158***	0.2213***
	(1.4079)	(-54.8398)	(5.8936)
Cashflow	2.8677***	2.5406***	2.0223***
	(14.7851)	(28.5484)	(12.1619)
FIXED	-0.6670***	-0.3464***	-0.4863***
	(-9.1232)	(-8.9781)	(-7.1139)
Top1	-0.0033***	-0.0034***	-0.0018**
	(-4.0181)	(-8.6724)	(-2.2584)
Indep	0.0065***	-0.0056***	0.0070***
	(3.2521)	(-5.2835)	(3.6788)
Growth	0.3841***	0.5104***	0.2320***
	(15.8521)	(28.8407)	(11.0205)
_cons	7.2854***	-5.5413***	9.5192***
	(25.0735)	(-40.4209)	(34.5129)
N	32531	32531	32531
r2_a	0.2308	0.2845	0.2994

As shown in Table 7, column (2) indicates that the quality of ESG information disclosure can have an impact on the attention of research subjects, and presents an inverted U-shaped effect, that is, as the quality of ESG information disclosure of enterprises gradually increases, that is, when they are in the growth stage, the attention of research subjects gradually increases, but when the enterprise is in the mature stage, the attention of research subjects gradually decreases. Column (3) indicates that in the process of the impact of ESG information disclosure quality on enterprise performance, the attention of research subjects plays a partial mediating effect, that is, H2b certification.

Therefore, combining Tables 7 and 8, it can be concluded that both analyst attention and research attention play a mediating role in the impact of ESG information disclosure quality on corporate performance. That is to say, the attention of professional institutions does indeed play a mediating role in the impact of ESG information disclosure quality on corporate performance, which is supported by H2.

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Table 7. Intermediary Inspection of Research Declaration Attention

Variable	(1)	(2)	(3)
	TobinQ_w	yanbao	TobinQ_w
ESG_2	-0.2036***	0.2307***	-0.2366***
	(-4.6166)	(6.5194)	(-5.5518)
ESG_22	0.0227***	-0.0083*	0.0215***
	(4.1184)	(-1.9227)	(4.0971)
Size_w	-0.2222***	0.5361***	-0.3707***
	(-18.0407)	(77.9695)	(-30.6879)
Lev_w	-0.7809***	-1.2268***	-0.3921***
	(-10.1256)	(-28.0048)	(-5.3955)
FirmAge_w	0.0537	-1.0738***	0.2118***
	(1.4079)	(-52.1320)	(5.6446)
Cashflow_w	2.8677***	3.3609***	1.9603***
	(14.7851)	(30.6169)	(11.8793)
FIXED_w	-0.6670***	-0.4469***	-0.4767***
	(-9.1232)	(-9.3917)	(-6.9838)
Top1_w	-0.0033***	-0.0044***	-0.0017**
	(-4.0181)	(-9.1016)	(-2.1686)
Indep_w	0.0065***	-0.0061***	0.0068***
	(3.2521)	(-4.6779)	(3.5990)
Growth_w	0.3841***	0.6731***	0.2140***
	(15.8521)	(30.8361)	(10.2016)
yanbao			0.2601***
			(28.7451)
_cons	7.2854***	-7.1192***	9.6240***
	(25.0735)	(-42.1014)	(34.8298)
N	32531	32531	32531
r2_a	0.2308	0.2863	0.3022

5.5. Robust Test

Based on the research of Wang Rong (2022), the impact of ESG information disclosure quality on corporate performance has a time lag, so the impact of current ESG ratings on corporate performance may be reflected in the next period. In addition, this can also overcome the potential endogeneity issues between variables, thus lagging the company's ESG by one period. As shown in the first column of Table 8, the regression coefficients of the two are still significant.

In addition, to further ensure the reliability of this study, we refer to the method of Velte P (2017) and use the price to book ratio PB, which can comprehensively reflect the performance of the enterprise, as a substitute for TobinQ for regression analysis. The regression results are shown in the second column of Table 8. The results indicate that after conducting surrogate variable regression, the research conclusions of this study remain robust.

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Table 8. Robustness Test

Variable	(1)	(2)
	TobinQ	PB
L.ESG	-0.0922***	
	(-2.8321)	
ESG		-0.4832***
		(-3.4328)
L.ESG2	0.0006***	
	(2.6826)	
ESG2		0.0034***
		(3.5285)
Size	-0.2409***	-0.9327***
	(-18.3014)	(-21.3890)
Lev	-0.9451***	2.1986***
	(-11.2618)	(6.6572)
FirmAge	-0.0504	-0.8025***
	(-1.1505)	(-7.9678)
Cashflow	3.0302***	6.5608***
	(14.2128)	(11.9610)
FIXED	-0.8419***	-2.3729***
	(-10.7334)	(-11.9753)
Top1	-0.0019**	0.0039**
	(-2.1715)	(2.0211)
Indep	0.0066***	0.0091*
	(3.0890)	(1.8844)
Growth	0.3050***	1.0238***
	(12.3792)	(11.6569)
_cons	11.1518***	42.4140***
	(9.1465)	(7.6259)
N	28416	32531
r2_a	0.2548	0.1766

5.6. Heterogeneity Analysis

China is a country that follows the path of socialism with Chinese characteristics, and under the influence of the system, there are significant differences between state-owned and non-state-owned enterprises.

There are more connections between state-owned enterprises and the government, which makes state-owned enterprises more proactive in assuming social responsibility, fulfilling their corporate social responsibility, and taking the initiative to set an example among all enterprises. From this perspective, it is mandatory and policy based for state-owned enterprises to disclose ESG information. However, non-state-owned enterprises may have some shortcomings in this aspect, as their main business objectives are in financial indicators. If non-state-owned enterprises actively disclose ESG at this time, it will break the public's stereotype of them and be seen as a positive response to society and the public. Such behavior often triggers broader and stronger attention and response from society.

Therefore, this article makes a preliminary assumption that the impact of ESG information disclosure quality on corporate performance will be more significant in non-state-owned enterprises.

The results in Table 9 demonstrate this hypothesis.

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Table 9. Heterogeneity Analysis Based on Property Rights Nature

Variable	state-owned enterprise	Non state-owned enterprises
	TobinQ_w	TobinQ_w
ESG_2	-0.1103	-0.2017***
	(-1.5128)	(-3.5862)
ESG_22	0.0161*	0.0209***
	(1.8294)	(2.9220)
Size_w	-0.2570***	-0.2096***
	(-13.2308)	(-11.3471)
Lev_w	-1.1265***	-0.6862***
	(-8.7560)	(-6.9262)
FirmAge_w	-0.0955	0.0642
	(-1.4351)	(1.3356)
Cashflow_w	2.1322***	3.1535***
	(5.8955)	(13.6655)
FIXED_w	-0.8408***	-0.5556***
	(-7.3119)	(-5.3125)
Top1_w	-0.0015	-0.0044***
	(-1.0837)	(-4.1877)
Indep_w	0.0068**	0.0073***
	(2.2659)	(2.7971)
Growth_w	0.1848***	0.4470***
	(5.6253)	(14.3014)
_cons	8.4909***	6.9058***
	(17.3927)	(15.9079)
N	10556	21188
r2_a	0.3086	0.1972

6. Countermeasures and Suggestions

In recent years, the "dual carbon target" has become a trend, and sustainable and high-quality development is the primary task of comprehensively building a socialist modernized country. The importance of ESG information disclosure is becoming increasingly prominent. Although in the short term, ESG concepts may increase operational costs and exacerbate short-sighted behavior of managers, which is not conducive to improving corporate performance, in the long run, improving the quality of ESG information disclosure can promote green innovation and improve investment behavior, which is beneficial for improving corporate performance. This article proposes the following reference suggestions for different market entities.

For enterprises, continuously improving their ESG performance and deepening their understanding of green and sustainable development concepts. Enterprises need to improve their ESG information disclosure. Enterprises should incorporate ESG factors into their strategic decision-making and achieve long-term stable growth in financial performance by enhancing ESG performance. On the one hand, it can leverage the supervisory role of various stakeholders, forcing senior management to recognize that improving ESG performance can ultimately achieve sustainable development of the enterprise; On the other hand, it can enhance the investment preferences of various investment institutions towards enterprises, obtain more external funding and resource support for enterprise research and development innovation activities, and achieve growth in enterprise performance. Moreover, better information disclosure quality of enterprises will transmit better market signals, improve

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corporate image, optimize external responsibility performance, increase the attention of professional institutions, and thus force enterprises to optimize ESG performance and improve performance levels.

For the government, the government and relevant departments should improve the construction of ESG related systems and establish a sound ESG evaluation system. Incorporate ESG information disclosure into relevant laws and regulations, improve the ESG information disclosure system, and establish a unified ESG information disclosure standard and framework. Relevant institutions are increasing their regulatory efforts on ESG information disclosure, and implementing corresponding rewards and punishments based on corporate ESG performance to encourage companies to improve their ESG performance. At the same time, fully utilize market mechanisms, increase the importance of ESG responsible investment by commercial banks and other financial and investment institutions, encourage and guide them to increase their ESG investment in enterprises, and help enterprises achieve sustainable development.

For investors, they can make responsible investments based on the company's ESG performance, guiding the company to improve its own ESG performance. When making investment decisions, investors should not only pay attention to the financial information of the company, but also to various non-financial information in the social responsibility report. Investors can increase their consideration of corporate environment, social responsibility, and corporate governance. On the one hand, they can discover companies with long-term development potential, reduce investment risks, and improve long-term investment returns; On the other hand, by conveying the importance of fulfilling social responsibility through investment orientation, companies can be guided to focus on long-term high-quality development, actively disclose ESG related information, and strengthen ESG construction.

7. Conclusion

In recent years, ESG information disclosure has become a key focus in China, and the importance of ESG information disclosure quality is gradually increasing. The government is also vigorously strengthening the relevant system for ESG information disclosure, and ESG information disclosure is highly compatible with our country's "dual carbon goals", sustainable green development and other concepts.

Study the impact of ESG information disclosure quality on corporate performance of A-share listed companies from 2011 to 2022. It is concluded that there is a U-shaped relationship between the two. That is to say, ESG is negatively correlated with corporate performance to a certain extent, and after exceeding the threshold, it shows a positive correlation. Further research has found that the attention of professional institutions plays a mediating role. Through heterogeneity analysis, it was found that the impact of ESG information disclosure quality on corporate performance is more significant in non-state-owned enterprises.

Although the research conclusions of this article have been confirmed, there are still some shortcomings, such as the single choice of research indicators, such as the selection of ESG information disclosure quality indicators. Different rating agencies may have different final scores due to differences in rating standards. However, this article only uses the ESG rating indicators of the China Securities Index for analysis. In future research, different rating agency scores may be used to make the empirical results more robust.

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