

Research on the Impact of Media Attention on Corporate ESG Performance-based on the Mediating Effect of Green Innovation

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Abstract: In order to achieve the goal of green economic development, the environmental, social and governance (ESG) performance of enterprises has gradually attracted the attention of organizations from all walks of life. Therefore, how to improve corporate ESG performance to achieve green economic transformation and improve sustainable development capabilities has become a key issue in theory and practice. Based on data from 724 listed companies in China from 2015 to 2021, this study systematically explores the impact of media attention on corporate ESG performance and the intermediary role of green innovation. Research shows that media attention has a positive impact on corporate ESG performance. The higher the media attention, the better the corporate ESG performance. In addition, green innovation plays a mediating role in the impact of media attention on corporate ESG performance.

Keywords: Corporate ESG Performance; Media Attention; Green Innovation.

1. Introduction

As environmental pollution, climate change and other problems around the world gradually intensify, various countries have realized the importance of achieving green development and harmonious coexistence between man and nature. Corporate ESG performance refers to a company's performance in aspects such as environment, social responsibility, and corporate governance. It can accurately measure a company's sustainable development capabilities and help companies achieve coordinated development of economic and social benefits. With the in-depth development of ESG concepts, corporate ESG performance has become an effective measure for companies to achieve green economic transformation. However, there are currently relatively few studies focusing on the factors affecting corporate ESG performance. Therefore, exploring how to effectively improve corporate ESG performance is an important issue that needs to be solved urgently.

With the rapid development of the Internet era, the media has an important impact on corporate governance and operating activities in the process of promoting companies to improve corporate ESG performance and sustainability [[1]]. Specifically, on the one hand, the media has an external governance role and can supervise the behavior of companies, promote companies to actively improve environmental pollution problems, take the initiative to assume social responsibilities, solve corporate governance problems in a timely manner, and urge companies to pay attention to their own ESG performance [[2]]. On the other hand, the media has a reputation management function, which can help companies establish a good image, encourage companies to carry out ESG construction, and gain social recognition [[3]]. Therefore, the impact of media attention on corporate ESG performance cannot be ignored and has important practical value.

In addition, companies cannot improve their ESG performance without the support of innovation, and green

innovation is an important tool to help companies improve their sustainable development capabilities [[4]]. Enterprises cannot improve their performance in environmental, social responsibility and corporate governance without the support of corporate green innovation. Previous research pointed out that companies can help companies solve environmental pollution problems through green innovation [[5]]. The supervisory role of media attention can promote companies to carry out innovative activities, can have an impact on corporate green innovation [10], and ultimately affect the development of corporate ESG construction. It can be seen that the role of green innovation in the impact of media attention on corporate ESG performance cannot be ignored.

This study is based on data from 724 listed companies in China from 2015 to 2021, and mainly studies the impact of media attention on corporate ESG performance. The intermediary effect of green innovation is further explored. The contributions of this study are: on the one hand, it systematically explores the impact of media attention on corporate ESG performance and enriches the research on the antecedents of corporate ESG performance. On the other hand, this study explores the mediating role of green innovation in the impact of media attention on corporate ESG performance, opening the "black box" of the impact mechanism of corporate ESG performance.

The remainder of the study is structured as follows: Section 2 sets out the theoretical analysis and research hypotheses, section 3 presents the methods and data, section 4 presents the empirical results and discussion and the final section summarizes the main research findings and policy implications.

2. Theoretical Analysis and Research Hypothesis

2.1. Media Attention and Corporate ESG Performance

At present, the media is gradually becoming an important

information medium, which can help enterprises reduce the problem of information asymmetry, convey external social dynamics to enterprises, and convey information related to enterprise development to the outside world. The impact of media attention on corporate ESG performance is mainly reflected in two aspects: First, the media has a supervisory and governance role. The media can supervise whether ESG disclosure complies with regulations by reporting relevant information on corporate ESG performance [[7]]. Second, the media has a role in reputation management, and the media can affect the public image of the company by reporting its behavior [[8]]. Therefore, companies that receive more media attention will work harder to improve their ESG performance in order to win external recognition and a good corporate image. Secondly, the media and other publics are important stakeholders in the process of corporate ESG construction. Companies need to balance and satisfy the needs and preferences of stakeholders in order to better achieve business goals [[9]]. Therefore, the media's preference and attention to ESG can make companies pay attention to ESG construction. To sum up, media attention can promote companies to improve ESG performance. Thus, we posit that:

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

2.2. Mediating effect of green innovation

2.2.1. Media attention and green innovation

Green innovation is an important tool to help companies achieve sustainable development and improve their ESG performance. Based on the stakeholder theory, the media, as an important stakeholder of the enterprise and an important participant in the external governance of the enterprise, can influence the green innovation activities of the enterprise through media reports and other methods. First of all, media attention can prompt companies to pay more attention to the needs of stakeholders, guide companies to pay more attention to ecological and environmental protection issues, and stimulate companies to improve their green innovation performance [[6]]. Secondly, media attention can form a governance effect on enterprises through the information diffusion model, thereby affecting the innovation activities of enterprises. The media can not only collect and organize information about enterprises, but also provide diversified perspectives to help enterprises improve their innovation

To verify the mediating effect of green innovation, this study constructed models 2 and 3, as shown in equation (2) and (3). GI is green innovation, which is the dependent

$$ESG_{i,t} = \alpha_0 + \alpha_1 MA_{i,t} + \alpha_2 Controls + \sum_{t=1}^m year_t + \sum_{i=1}^n ind_i + \varepsilon_{i,t} \quad (1)$$

$$GI_{i,t} = \beta_0 + \beta_1 MA_{i,t} + \beta_2 Controls + \sum_{t=1}^m year_t + \sum_{i=1}^n ind_i + \varepsilon_{i,t} \quad (2)$$

$$ESG_{i,t} = \beta_0 + \beta_1 MA_{i,t} + \beta_2 GI_{i,t} + \beta_3 Controls + \sum_{t=1}^m year_t + \sum_{i=1}^n ind_i + \varepsilon_{i,t} \quad (3)$$

In the regression model, Controls is the control variable, Year and Ind represent the time dummy variable and the industry dummy variable respectively, and ε represents the random error.

3.2. Variable Definition

3.2.1. Dependent Variable

Corporate ESG performance (ESG): With reference to the research of scholars such as Ning and Zhang (2023) [[15]],

levels [[10]]. To sum up, media attention will have an impact on corporates' green innovation. Thus, we posit that:

Hypothesis 2: Media attention has a positive impact on green t innovation.

2.2.2. Media attention, green innovation and corporate ESG performance

Green innovation is an important starting point for enterprises to achieve sustainable development, and it is also an important measure to help enterprises improve their ESG performance. It can help enterprises improve their sustainable competitiveness and sustainable development capabilities [[11]], and thus help enterprises improve their environmental, social and Performance in all aspects of corporate governance. First, research points out that by enhancing green innovation capabilities, companies can improve their pollutant management and help companies improve their environmental governance performance [[12]]. Secondly, new R&D technologies can help companies better assume social responsibilities and improve their social responsibility. Responsibility performance [[13]]. In addition, the increase of corporate green innovation is helpful for companies to establish a good corporate image, reduce corporate investment risks, and can help companies solve corporate governance problems in a timely manner [[14]]. Therefore, green innovation can be viewed from the perspective of environmental and social responsibility and corporate governance to improve corporate ESG performance. In addition, based on the impact of media attention on green innovation, this study further proposes that media attention will affect the ESG performance of enterprises by affecting green innovation activities. Thus, we posit that:

Hypothesis H3: Green innovation plays a mediating effect between media attention and corporate ESG performance.

3. Research Design

3.1. Model Construction

To verify the influence mechanism of media attention on corporate ESG performance, this study constructed regression model 1, as shown in equation (1), where dependent variable ESG is corporate ESG performance, independent variable is media attention. The regression model is:

variable of model 2 and the mediating variable of model 3 respectively, and the independent variable is media attention. The regression model is:

This study adopted HuaZheng ESG Rating Index built based on publicly disclosed information and other data in Wind database. The rating is divided into 9 levels, and is evaluated 1-9 points from the lowest to the highest. The rating is given 4 times a year, and the average value of the 4 ratings is taken as the proxy variable of corporate ESG performance.

3.2.2. Independent Variable

Media attention (MA): Current media reports are divided into traditional newspaper news and online news. This study

refers to the research of Ho et al. (2023) [[16]], using the natural logarithm of the total number of media reports of traditional newspaper news and online news as the proxy variable for media attention.

3.2.3. Mediating Variable

Green innovation (GI): Referring to the research of scholars such as Ho et al. (2023) [[16]], the number of green patent applications of enterprises can reflect the efforts of enterprises to carry out green innovation activities. Therefore, this study adopted the number of green patent applications of enterprises as the proxy variable of green innovation.

3.2.4. Control Variables

With reference to previous studies, this study controlled other variables that may affect corporate ESG performance of enterprises. Control variable selected asset-liability ratio (LEV), return on total assets (ROA), enterprise Age (Age), Growth ability (Growth), current asset ratio (Tangi), and Board size (Board) were taken as control variables, and industry dummy variables (Industry) and time dummy variables (Year) were added. The specific variables are explained in Table 1.

Table 1. Variable definition

Variable type	Variable	Measurement
Dependent variable	ESG	The average of the four ratings of Huazheng ESG Rating Index score
Independent variable	MA	Natural logarithm of total number of newspaper and online news reports
Mediating variable	GI	Number of green patent applications
Control variable	LEV	Total liabilities / Total assets of enterprise
	ROA	net profit / Total assets of enterprise
	Age	The number of years the company has been listed
	Growth	Growth rate of main business income
	Tangi	Current assets / Total assets of enterprise
	Board	The total number of board members
	Ind	Industry variable
	Year	Year variable

3.3. Sample Selection and Data Sources

This study took 724 heavy polluting listed companies from 2015 to 2021 in China as research samples. After preliminary data processing, ST, *ST type enterprises, and samples with missing data values and outliers were deleted, 5068 sample observations were finally obtained. Among them, ESG rating data comes from the Wind database. Media attention and green innovation data come from the CNNS database. Other data mainly come from the CSMAR database. This article uses Stata16.0 software to process data.

4. Empirical Results and Discussion

4.1. Descriptive Statistics

The descriptive statistical results are shown in Table 2. The average value of corporate ESG performance (ESG) is 6.428, and the variance is 1.197. It can be seen that corporate ESG performance of different enterprises still has a large gap and uneven development. The mean value of media attention (MA) is 5.671, and the variance is 1.479. It can be seen that there are great differences in the degree of media coverage of different enterprises. The descriptive statistical results of the remaining variables are also within the normal range.

Table 2. Descriptive statistical

Variable	N	Mean	SD	MIN	MAX
ESG	5,068	6.428	1.197	2	9
MA	5,068	5.671	1.479	0	13.68
GI	5,068	10.32	74.10	0	2,371
PR	5,068	6.506	0.923	2	9
ROA	5,068	0.163	0.344	-8.669	5.476
LEV	5,068	0.424	0.192	0.001	1.515
Age	5,068	19.44	5.555	6.330	54
Growth	5,068	0.991	24.24	-9.997	1,142
Tangi	5,068	0.914	0.0874	0.365	1
Board	5,068	10.33	2.631	5	26

4.2. Correlation Analysis

Table 3 shows the results of correlation analysis between the main variables. The correlation coefficient between the dependent variable corporate ESG performance (ESG) and the independent variable media attention (MA) is

significantly positive, indicating the existence of a positive relationship. And preliminarily verified the research hypotheses proposed in this study. Through the variance inflation factor test, it was found that the VIF value of each variable in this study was far less than 10, which can basically eliminate the multicollinearity problem between variables.

Table 3. Correlation analysis of main variables

Variable	ESG	MA	GI	ROA	LEV	Age	Tangi	Growth	Board
ESG	1								
MA	0.197***	1							
GI	0.118***	0.230***	1						
ROA	0.175***	0.043***	0.0180	1					
LEV	0.0110	0.226***	0.086***	-0.293***	1				
Age	0.074***	0.100***	0.036**	0.00100	0.090***	1			
Tangi	0.091***	0.052***	0.026*	0.039***	0.113***	0.134***	1		
Growth	-0.0130	0.040***	-0.005	-0.008	0.008	0.0150	-0.033**	1	
Board	0.097***	0.089***	0.073***	-0.069***	0.160***	0.107***	0.035**	0.054***	1

Notes: t-statistics in parentheses*** p<0.01, ** p<0.05, * p<0.1

4.3. Regression Results and Analysis

Firstly, stata16.0 was adopted to test the impact of media attention and corporate ESG performance, a benchmark regression test on model (1) was conducted and the regression results were shown in Table 4. According to the regression results, the regression coefficients of media attention (MA) on corporate ESG performance (ESG) are 0.205, respectively, and it are significant at 1% confidence level. It can be concluded that media attention has a significant positive impact on corporate ESG performance, assuming H1 is supported. It can be seen that the higher the media attention, the higher corporate ESG performance of the enterprise.

Secondly, a benchmark regression test on model (2) was conducted to test the relationship between benefit drivers and green innovation. The regression results were shown in columns (2) in Table 4. According to the regression results,

the regression coefficients of media attention (MA) on green innovation (GI) is 12.203, which is significant at 1% confidence level. Therefore, media attention has a significant positive impact on green innovation, assuming that H2 is supported. And a benchmark regression test on model (3) was conducted. The regression results were shown in columns (3) of Table 4. According to the regression results, after adding the mediating variable green innovation, the regression coefficients of media attention (MA) on corporate ESG performance is 0.187, which is significant at the 1% confidence level. Meanwhile, the regression results Table 4 show that the regression coefficients of the mediating variable green innovation on corporate ESG performance is 0.001, which is significant at 1% confidence level. To sum up, it can be concluded that green innovation has a partial mediating effect on the influence of media attention on corporate ESG performance, assuming that H3 is supported.

Table 4. Media attention green innovation and corporate ESG performance

Variable	(1)	(2)	(3)
	ESG	GI	ESG
MA	0.205***	12.203***	0.187***
	(14.36)	(14.29)	(12.99)
GI			0.001***
			(5.69)
Controls	YES	YES	YES
Year PE	YES	YES	YES
Ind PE	YES	YES	YES
Constant	4.166***	-89.564***	5.169***
	(15.53)	(-5.53)	(11.07)
N	5,068	5,068	5,068
R ²	0.147	0.185	0.152
P	0.000	0.000	0.000

Notes: t-statistics in parentheses*** p<0.01, ** p<0.05, * p<0.1, In order to save space, the results of control variables are not reported.

4.4. Robustness Test

4.4.1. Delayed One-phase Test

Table 5. Benefit drivers and Corporate ESG performance

Variable	(1)	(2)	(3)
	ESG	GI	ESG
MA	0.209***	11.012***	0.178***
	(11.71)	(16.61)	(9.91)
GI			0.002***
			(6.02)
Controls	YES	YES	YES
Year PE	YES	YES	YES
Ind PE	YES	YES	YES
Constant	4.014***	-70.712***	5.262***
	(13.50)	(-6.30)	(10.23)
N	4,344	4,344	4,344
R ²	0.146	0.355	0.152
P	0.000	0.000	0.000

Notes: t-statistics in parentheses*** p<0.01, ** p<0.05, * p<0.1

Considering that there may be endogeneity between variables, one-phase lag processing was adopted to solve the endogeneity problem, and the dependent variable from t period was changed to t+1 period, and the test was run again. The test results were shown in Table 5. According to the regression results, media attention has a significant positive impact on corporate ESG performance, and green innovation has mediating effect. The research results are basically consistent with the previous research results, there is no endogeneity problem between variables, and the research results are robust.

4.4.2. Replace the Measurement of the Mediating Variable

This study further adopted the measurement method of replacing intermediary variables, and used the number of green invention patents to replace the original measurement method to measure green innovation, and conducted a robustness test to ensure the stability of research results. The regression results were shown in Table 6. Green innovation has an intermediary effect. This result is basically consistent with the results of previous studies, which further proves the robustness of the results of this study.

Table 6. The mediating effect test of green innovation

Variable	(1)	(2)
	GI	ESG
MA	5.835***	0.187***
	(12.89)	(13.08)
FC		
GS		
GI		0.003***
		(6.14)
Controls	YES	YES
Year PE	YES	YES
Ind PE	YES	YES
Constant	-43.507***	5.170***
	(-5.06)	(11.08)
N	5,068	5,068
R ²	0.322	0.153
P	0	0

Notes: t-statistics in parentheses*** p<0.01, ** p<0.05, * p<0.1

5. Conclusion

5.1. Research Conclusion

Through theoretical analysis and empirical research, this study explored the relationship between media attention on corporate ESG performance, as well as the mediating effect of green innovation. The results show that: Media attention has a positive impact on corporate ESG performance. The higher the media attention a company receives, the more it can promote the company to carry out ESG construction and improve ESG performance. Green innovation plays a mediating role in the impact of media attention on corporate ESG performance. Media attention can further affect corporate ESG performance by affecting corporate green innovation activities.

5.2. Managerial Implications

First of all, companies should understand and pay attention to the importance of external media publicity to corporate ESG performance, and actively carry out ESG construction. In the face of media reports and supervision, companies should actively respond to media reports, make full use of the external supervision and reputation management functions of the media, improve corporate ESG performance, establish a good corporate image through media reports, and win recognition from the outside world. In addition, companies should pay attention to the development of green innovation activities, and companies should actively develop new technologies to help themselves improve their ESG

performance.

In addition, the media, as an important external governance role of enterprises, should make full use of its supervisory role, appropriately use public opinion to guide enterprises to implement ESG concepts, improve ESG performance, increase reporting on enterprise ESG-related content, and guide the public, investors, etc. External stakeholders of a company pay attention to the company's ESG performance when making investment decisions.

Author Contributions

Conceptualization, Methodology, Data curation, Formal analysis and Software, Writing-review and editing, X.D. Author has read and agreed to the published version of the manuscript.

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Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Conflicts of Interest

The authors declare no conflict of interest.

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