



Research article

A pathway towards corporate sustainability: Does media attention matter?

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ABSTRACT

Examining informal institutional drivers of corporate sustainability is crucial. This study employs a sample of A-share listed firms in China from 2007 to 2020 to empirically examine the relationship between media coverage and ESG performance. It is demonstrated that media attention enhances corporate accountability, especially the print media and positive attention. And environmental investments and green innovation are the main mechanisms. It also reveals that media attention has a greater impact on larger firms, those with better internal controls, firms located in the eastern region, and manufacturing firms. Our findings help deepen the understanding of media's role in corporate development and highlight how informal institutions can promote sustainable economic growth in developing countries.

1. Introduction

As the core driving force of economic development, enterprises have also generated a series of negative externalities such as pollution emissions, resource consumption, and deficiencies and alienation of social responsibilities in the process of empowering national economic development. Against the backdrop of frequent global climate issues and widening gaps between the rich and the poor, enterprises, as main sources of production and the pollutant emissions, are endowed with more diverse roles and responsibilities beyond traditional corporate social responsibility (CSR). Enterprises need to comprehensively consider their sustainable development and external impacts, and proactively fulfill environmental, social and governance (ESG) responsibilities to satisfy multifaceted socio-economic needs. While pursuing profit maximization, enterprises must raise their awareness of responsibility and proactively consider public welfare, energy conservation, environmental protection, governance effectiveness and more, exploring unified business operation and development paths that enable enduring enterprise and societal sustainability. and making active contributions to improving the overall social welfare. At present, ESG information disclosure has also become an important basis for assessing corporate sustainability capabilities and value creation.

With ESG ratings becoming an important indicator in the capital market, the economic, environmental and social benefits brought by corporate fulfillment of ESG responsibilities have received extensive attention [1–4]. Enhanced corporate accountability and credible ESG disclosures help earn the trust of stakeholders such as investors, customers, suppliers, financial institutions [5–7], alleviate financing constraints, and increase market value [8]. Corporate ESG fulfillment affects firm value through financial performance and operational capabilities [9]. In addition, strong ESG performance empowers enterprises with capabilities to cope with

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extreme external risks and ensure stock price stability [10]. Chouaibi et al., 2021 believed corporate environmental information disclosure has a positive impact on financial performance, and corporate fulfillment of social responsibilities and strengthening of business ethics can promote such a positive impact [11]. Meanwhile, ESG related information disclosure can raise stakeholders' environmental awareness and draw more attention to corporate carbon emissions, strengthening the link between environmental and financial performance [12], thereby motivating enterprises to improve management decisions to reduce pollutant emissions. Li et al., 2023 concluded that corporate ESG fulfillment can improve information environment, reduce financial constraints, and enhance labor investment efficiency [13].

However, fulfilling ESG responsibilities is typically a high-cost activity with strong externalities. China's ESG practices are still in the early stage, with insufficient disclosure and awareness. Therefore, further joint efforts are needed from all parties to improve corporate ESG management awareness and investment. The academia has mainly discussed the motivations for corporate ESG fulfillment from external institutional policies and internal governance. On the one hand, existing studies widely recognize that institutional policies like green finance and environmental regulations are important drivers for enterprises to improve ESG performance [14,15]. Wang et al., 2022 empirically examine the effectiveness of China's central environmental inspection system on improving corporate ESG performance, and illustrate the reinforcing effects of internal governance factors like institutional investor ownership and external governance factors via media [16]. On the other hand, from the perspective of corporate internal management, effective boards of directors will take proactive actions to avoid the negative impacts of opportunism [17], thereby promoting corporate sustainability.

As an independent informal supervisory mechanism, media coverage significantly molds corporate governance trajectories [18]. In the evolution of corporate institutions, the media plays an indispensable role, and many corporate violations and illegal activities are unearthed by media exposure. Media coverage effectively makes up for the vacancies in government supervision and inhibits corporate rent-seeking behaviors. As the main channel for stakeholders to obtain corporate information, media attention and exposure have the dual functions of information dissemination and external supervision [19]. Media coverage can draw public attention to form public opinion pressure on enterprises, providing stimulus and facilitation. It further helps reduce information asymmetry between enterprises and stakeholders like investors and creditors, influencing their judgement on enterprises and driving enterprises to take remedial actions on pressing issues. With the continuous development and maturation of the media industry, enterprises have realized the importance of proactively fulfilling social responsibilities and participating in environmental governance. Therefore, to obtain positive media evaluations and public opinion, many enterprises will proactively implement behaviors that are beneficial to the society and environment, so as to gain the trust of institutional investors. Hence, there is a certain correlation between media attention and corporate ESG performance. Incorporating the media into corporate ESG management is of great significance for achieving sustainable development of both enterprises and the society. However, it is worth noting that research specifically focusing on how media coverage of companies affects their ESG fulfillment is limited. Further exploration would advance understanding of media's role as an informal institution in corporate sustainability, and provide valuable insights for enterprises to fulfill ESG responsibilities and improve ESG performance.

Therefore, to make a valuable contribution to the research on the influencing factors of ESG and the social welfare impact of media attention, we aim to address the following questions: What is the impact of media attention on corporate ESG performance? How does this impact change over time? What are the mechanisms of this impact? Are there heterogeneous characteristics in the impact? Specifically, this study utilizes data of A-share listed companies in China from 2007 to 2020. Based on corporate ESG performance from Bloomberg database and media coverage data from the CNRDS database to capture the level of media attention received by companies, we empirically examine how media attention affects corporate sustainability.

It is found that media attention can significantly improve corporate ESG performance, and the effect has strengthened in recent years. Additionally, by categorizing media coverage into positive, neutral, and negative reports, and differentiating media sources into print and online media, we discover that print media and positive coverage have a greater incentivizing effect on firms to fulfill their ESG responsibilities.

Further, we elucidate the environmental investments and green innovation are the main mechanisms through which media attention influences ESG performance. Finally, to illustrate the conditions under which media attention enhances corporate ESG performance, we estimate the heterogeneous effects of media attention on ESG. We conclude that media has a greater impact on larger firms, those with better internal controls, firms located in the eastern region, and manufacturing firms.

Our research makes potential marginal contributions to the existing literature. Firstly, the current literature on media attention has generally focused on the impacts on corporate governance [20], capital markets [21,22], environmental information disclosure [23] and corporate social responsibility [24]. There are two main different views: one is that media attention, as an information intermediary, builds a bridge between the public and enterprises, reducing information asymmetry in the capital market [22]. By guiding public opinion, shaping public perception and judgement, it prompts enterprises to rectify inappropriate behaviors. Enterprises can also obtain public needs through the media to take socially-aligned actions [25], enhancing accountability. The other view is that market pressures and cost effects brought by media attention induce superficial corporate "greenwashing" behaviors with low costs, inducing enterprises to timely repair public reputation and establish a positive image through formalistic means, so as to make formalistic repairs to reputation and image amid the negative effects caused by media attention. This is detrimental to enterprises fulfilling environmental and social responsibilities [26]. Therefore, the impacts of media on corporate actual ESG performance remain uncertain, with limited empirical evidence from developing countries. Our study complements previous analyses by studying the Chinese market where ESG concepts are still immature, examining the role of media in corporate sustainability. We find that media attention can strengthen corporate awareness of accountability, more consistent with the first perspective. Due to differences in regulatory environments, public participation and market development between China and developed countries, the media plays a

mainly positive role. This provides a supplement to existing research, enriching the country-specific research on media influence. It suggests that amid strengthening ESG imperatives, enterprises should pay attention to public opinion supervision, while the government should also actively guide the media to play a constructive role.

Secondly, our study contributes to the literature on drivers of corporate ESG practices. While prior research has focused on formal institutions such as government regulations, green finance and corporate governance [14,15,27,28], there has been less focus on welfare impact and dynamic effects of media as an informal institution. In the information age, media is the primary means of information dissemination and a crucial channel for the public to exercise their supervisory role. It is necessary to highlight the importance of media in corporate behavior. Leveraging large-scale media coverage data from both print and online sources, we empirically validate the oversight role of media in enhancing corporate ESG performance, and provide additional insights to the mechanisms and heterogeneity, advancing our understanding of incentives for driving corporate accountability of ESG. The findings also offer policy insights for governments, firms, and the public in harnessing media as a resource to foster virtuous ESG ecosystems.

The structure of the remainder of the paper is as follows: The second part reviews relevant literature and proposes associated theoretical hypotheses. The third part is the research design, introducing regression models, variables, data and samples. In the fourth section, we present empirical analysis findings on how media attention affects corporate ESG performance, as well as the results of mechanism tests. In the fifth part, we further discuss the heterogeneous effects. And the sixth section provides a summary of the overall work and proposes relevant policy recommendations. The specific research framework is illustrated in Fig. 1.

2. Literature review and hypothesis development

For environmental responsibility, the media is an important tool for disseminating information, lowering the cost of seeking information [29]. Public awareness of protecting environment has risen amid accelerating environmental pollution. The profit-driven character of the news media has led to an increase in corporate pollution behavior coverage [22]. As representatives of societal sentiments and values, media is crucial in regulating and guiding the environmental behavior of enterprises [30], prompting corporate positive responses to ecological issues [31]. Media attention has a dual effect on corporate environmental performance: First, media coverage leverages public opinion and social norms to constrain corporate behaviors [32,33], thus driving enterprises to rectify inappropriate actions [34]. The news is conducive to lessening the information gap between the general public and enterprises owing to its timeliness and topicality, which can increase the probability of exposing pollution problems and enhancing environmental concern [35,36]. By dampening reputations of enterprises, which is detrimental to corporate revenue, media attention and social opinion incentivize proactive investments of enterprises in environmental initiatives, disclosures, and performance improvements to compensate for reputation loss and meet expectations [37]. Second, media coverage of corporate pollution also draws intervention of local government departments [38], thereby discouraging corporate rent-seeking behavior. By eliciting investigation and punishment for corporate pollution behaviors, media coverage can effectively enhance corporate environmental awareness and performance [39].

Regarding social responsibility, North, 1990 argues that the purpose of institutions is to constrain social agents to conform to ethical, social and legal norms in their daily behavior [40]. Media serves as an informal institution beyond the law that also has an important role in motivating companies to fulfill their social responsibility [41]. On the one hand, media enables companies to rapidly build their image, which is crucial for attracting investors and serves as a key signal to attract and consolidate consumers amid contracting demand and supply shocks, with CSR disclosure enhancing corporate reputation in long term [42]. Media can promote the development of corporate CSR (Corporate Social Responsibility) [43,44], mainly by spotlighting negative incidents and praising positive behaviors, driving rectification of stakeholder-harming actions and reputation-repairing through social responsibility fulfillment. This cultivates brand reputation to retain consumers, reduce opportunistic behaviors of management, and increases the corporate attentiveness to stakeholders. On the other hand, media serves as a crucial source of information about firms for stakeholders

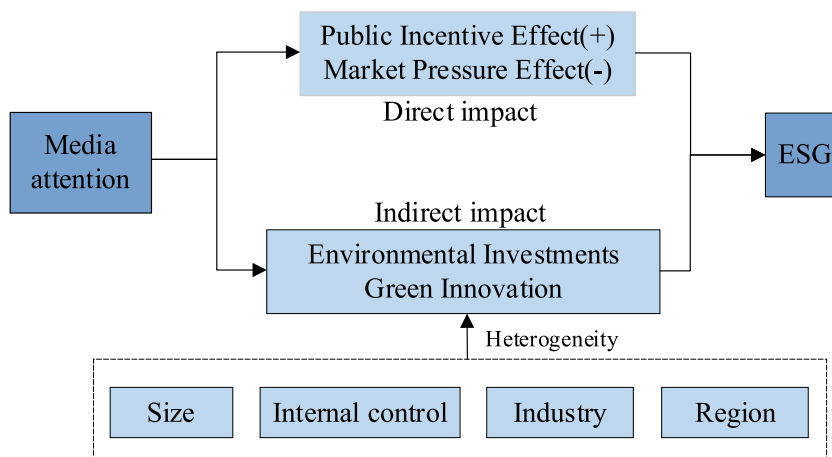


Fig. 1. Research framework.

[45] and can mobilize stakeholders' boycotting behavior or take other actions to punish CSR deficiencies, thereby compelling enterprises to fulfill their social responsibility [46].

In terms of corporate governance, media is a vital external corporate governance mechanism beyond mandatory polices, serving as an important information gateway that timely exposes corporate governance issues and strengths to the public while minimizing information asymmetry between stakeholders and enterprises [47]. Compared to some formal systems and oversight authorities, media as an external non-traditional oversight system can more quickly and effectively uncover corporate fraud, expose corporate accounting crimes and other violations, and engage in corporate governance by increasing legal penalties and influencing managers' reputations with employers or the public [22,48]. Meanwhile, media attention affects diverse business operations, such as stock prices, management compensation and turnover, corporate mergers and acquisitions, financial fraud, and strategic shifts [20]. Higher media attention can amplify corporate violation costs and promote managers' self-monitoring and disciplinary behavior, thus enhancing corporate governance efficacy and performance [49,50].

However, when facing market pressure and cost effects from media spotlight, some firms may limit themselves to public opinion pressure alone. This inclines them towards more aggressive and short-sighted actions to build positive images [51], so as to expand the positive effects of media attention while avoiding the negatives. This results in triggering firms to engage in low-cost "greenwashing" behavior rather than actual ESG performance improvement, which can opportunistically leverage media attention and public perception for profit goals [26]. Therefore, the "market pressure" caused by media attention is not conducive to the boost of ESG performance.

The first hypothesis of this paper is put forward in light of the discussion above:

Hypothesis 1a. Media attention can positively motivate corporate ESG investment and effectively improve ESG performance. More attention can strengthen corporate willingness for ESG fulfillment and performance.

Hypothesis 1b. The "market pressure" effect caused by media attention imposes additional costs on enterprises and is not conducive to providing positive incentives for ESG fulfillment.

The media, acting as a crucial bridge between the public and firms, helps the public access environmental information about firms, and influences corporate production behavior through public perception, evaluation, and behavior preferences [52]. Media coverage on environmental issues amplifies corporate performance losses by spreading information, garnering widespread attention and discussion. This public pressure directly impacts a company's social reputation, increasing reputational risk and operational costs, thus affecting its environmental strategies [53]. Weighing costs and benefits, companies may adopt proactive environmental measures to offset short-term reputational costs. Media reports also attract regulatory attention and intervention, enhancing oversight and enforcements. Firms need to improve their environmental governance and ESG performance for long-term profitability. Additionally, media is an important channel for investors to obtain corporate information [54], influencing their assessments of future profitability and risk. To attract and retain investors, firms actively invest in green practices, enhancing their ESG performance and showcasing their efforts in environmental protection and social responsibility.

On the other hand, the media can convey the expectations and demands of the public, customers, and investors for environmental protection and sustainable development. To enhance market competitiveness and gain market share, firms actively address environmental and social responsibility issues, responding positively to the information provided by media attention. This, in turn, leads to changes in long-term production decisions and innovation strategies, allowing firms to adopt measures that align with stakeholder demands and social values to achieve long-term social reputation and economic benefits [25,55]. Khosroshahi et al., 2021 found that stakeholder demands can motivate enterprises to engage in green innovation initiatives and boost green innovation outcomes [42], which can effectively contribute to the realization of long-term sustainable growth objectives [56]. Therefore, media attention can effectively encourage corporate environmental investments and green technology innovation [57,58], thus achieving the dual goals of environmental protection and profitability [59], while injecting new momentum for enterprises to improve their ESG performance. Accordingly, we propose the second hypothesis.

Hypothesis 2a. Media attention plays a monitoring and disciplinary role to compel corporate environmental investments and thus improve corporate ESG performance.

Hypothesis 2b. Media attention plays a monitoring and disciplinary role to promote corporate green innovation and thus enhance corporate ESG performance.

Compared to small firms, large enterprises attract more media attention, and reputation damage stemming from their polluting behavior imposes more substantial costs on their business operations. However, large enterprises possess a more robust economic and technological foundation, coupled with a more comprehensive and efficient internal governance structure. As a result, in the long run, large enterprises have both the capacity and motivation to enact measures that align with societal values and proactively fulfill their ESG responsibilities when subjected to media attention. In contrast, small firms face more severe financial constraints on technological innovation [60], raising barriers to technology acquisition and production model transformation. Hence, media attention imposes greater market pressure and costs on small firms, making them more inclined to act short-term responses.

Internal corporate governance helps promote the formation of the proper principles and positive corporate cultures. Enterprises with higher-quality internal controls confer resource allocation and stakeholder management capabilities, and their efficient corporate governance is more conducive to the achievement of ecological goals [61]. Therefore, in the face of media attention, enterprises with stronger internal controls tend to follow scientific decision-making and compensate and enhance public reputation through activities such as social responsibility and environmental protection [62], and properly cope with market pressure and negative shocks brought

by media attention [63]. On the basis of the above discussion, we propose the third hypothesis as follows.

Hypothesis 3a. Large-scale firms have greater incentives and advantages to fulfill ESG responsibilities amid media attention, with media attention primarily exhibiting a positive incentive impact on the ESG performance of large enterprises.

Hypothesis 3b. Firms with higher quality internal controls are more capable of ESG fulfillment to properly respond to media pressure, with media attention conferring greater impact on ESG performance of enterprises with stronger internal controls.

3. Empirical strategy

3.1. Sample and data

Chinese A-share listed companies from 2007 to 2020 are chosen as the research sample in this paper. We eliminate the samples labeled ST, *ST, PT and those with more missing data, removes the enterprises included in the insurance and financial industries, imputes missing values of key variables using interpolation methods, and finally gets the sample observation of 10830. The Chinese A-share market encompasses a wide range of industries, from traditional manufacturing to high-tech sectors, and includes both state-owned and private enterprises of various sizes. This comprehensive industry distribution and variety of enterprise types make the research findings broadly applicable and reflective of the overall corporate landscape. A-share listed companies are required to adhere to strict information disclosure regulations, providing high-quality and reliable data for research, facilitating precise empirical analysis. Additionally, as the world's second-largest economy, China's corporate ESG performance is increasingly drawing international attention. The A-share market is a crucial component of China's capital markets, with its listed companies playing significant roles and exerting substantial influence in economic activities. Studying A-share listed companies offers valuable insights for international comparative research, enhancing the diversity and completeness of global ESG studies. Therefore, the analysis in this paper holds significant reference value.

The data in this paper come from several different databases, each of which specializes in a different type of information. Corporate ESG score data is taken from the Bloomberg database. The media attention data come from the CNRDS database, while the data of green innovation come primarily from the CNRDS database and the Wind database. The corporate internal control index is from the DIB internal control database, and other information is sourced from the CSMAR database. This diversity of sources ensures that the data are reliable and comprehensive.

3.2. Model setting and definitions of variables

To explore the impact of media attention on corporate ESG performance, we construct the following regression model.

$$ESG_{it} = \alpha_0 + \alpha_1 News_{it} + \beta control_{it} + Industry + Year + \varepsilon_{it} \quad (1)$$

Where, i refers to the firm, t denotes the year, and ESG_{it} represents the ESG score of an enterprise. $News_{it}$ characterizes the media attention of firm i , measured by the logarithm of the total number of online media and newspaper media coverage of the firm plus one.

To exclude the effects from other factors on corporate ESG performance of the firm, drawing on He et al., 2024 and Garcia-Sanchez, 2014 [64,65], we incorporate several control variables: (1) Return on assets (*Roa*), represented by the ratio of net profit to total assets. It reflects a firm's profitability. Higher ROA indicates a greater capacity to fulfill ESG responsibilities. (2) Firm age (*Firmage*), measured as the logarithm of the number of years since the firm's establishment. Older firms typically have more developed management systems and organizational structures, and have higher brand reputation and social recognition, equipping them with greater advantages and capabilities in addressing environmental issues, fulfilling social responsibilities, and improving governance structures. (3) Gearing ratio (*Leverage*). It represents the extent of a firm's leverage. Higher leverage makes creditors pay more attention to the firm's operations and behavior, which can enhance ESG performance through external oversight, risk management, and investor pressure. (4) Board structure (*Director*), measured by the proportion of independent directors, who maintain objectivity and independence. With extensive industry experience and professional knowledge, independent directors can improve the quality of board decisions, fostering better ESG performance. And (5) cash flow ratio (*Cashflow*). It indicates a firm's financial health. Sufficient cash flow enables investment in environmental technologies and projects, allowing the firm to undertake more social responsibilities and

Table 1
Definition of variables.

Variable Name	Definition
<i>ESG</i>	Corporate ESG Score
<i>News</i>	Natural logarithm of the total media coverage plus 1
<i>Roa</i>	Net income/average balance of total assets
<i>Firmage</i>	Natural logarithm of the firm's age
<i>Leverage</i>	Total liabilities/total assets
<i>Director</i>	Number of independent directors/overall number of board members
<i>Cashflow</i>	Cash flow generated from corporate operating activities/total assets
<i>Ep</i>	Natural logarithm of the corporate investments in environmental protection
<i>Gpat</i>	Natural logarithm of the number of green patent applications plus one

improve ESG performance. Additionally, we control for industry (*Industry*) and year (*Year*) fixed effects to account for industry-specific and temporal variations, thereby enhancing the robustness and reliability of the findings.

Meanwhile, this study employing the following models to analyze the mechanisms through which media attention affects corporate ESG performance.

$$M_{it} = \gamma_0 + \gamma_1 News_{it} + \varphi control_{it} + Industry + Year + \varepsilon_{it} \tag{2}$$

$$ESG_{it} = \theta_0 + \theta_1 M_{it} + \eta control_{it} + Industry + Year + \varepsilon_{it} \tag{3}$$

where M_{it} denotes the mechanism variables, which are the corporate environmental protection input (*Ep*) and green innovation outputs (*Gpat*). And the control variables are the same as those mentioned previously. Table 1 provides the measurement information for each variable.

4. Results

4.1. Baseline regression

On the basis of model (1), the estimated results of the impact of media attention on corporate ESG performance without the inclusion of control variables are shown in Columns (1) and (2) of Table 2, respectively, when industry and year effects are not fixed and fixed. While the estimated results including control variables are reported in Columns (3) and (4) with the industry and year effects not fixed and fixed, respectively. It can be seen that statistically, the coefficients of *Media* are significantly positive, and economically, based on the marginal effect results, a 1 % increase in media attention is associated with an increase of approximately 0.01025–0.01622 units in corporate ESG performance. This indicates that media attention has a positive supervisory effect on corporate ESG fulfillment, further validating the conclusions of Dyck et al., 2008 and EI Ghoual et al., 2019 that media exposure leads enterprises to adopt more responsible governance measures [22,44]. Overall, whether statistically or economically, this study verifies the positive incentive effect of media attention on corporate ESG performance, supporting Hypothesis 1a.

To further examine the temporal heterogeneous effects of media attention, we include interaction terms between the explanatory variable and time dummy variables in Equation (1) for estimation, investigating the dynamic effects of media attention on corporate ESG performance. The results are depicted in Fig. 2. It is observed that except for the coefficient in the first period which is not significant, coefficients for other years are significantly positive. Particularly noteworthy is the increasing influence of media attention post-2015. This finding indicates that as societal emphasis on sustainable development grows, media plays a pivotal role in driving corporate ESG practices. Media attention significantly promotes corporate responsibility, highlighting the crucial role of informal institutions like media in constraining corporate behavior through public oversight, thereby complementing the regulatory limitations of formal institutions.

4.2. Further analysis

The above analysis demonstrates the positive impact of media attention on corporate ESG behavior. Considering the varying influences of media source and sentiment in reporting, this study further examines the differential effects of media types and sentiment on corporate behavior. Firstly, media is categorized into print media and online media, with the total number of media reports divided into press news (*PressNews*) and online news (*NetNews*). The study separately examines the effects of these two types of media attention

Table 2
Baseline regression results.

	(1)	(2)	(3)	(4)
	esg	esg	esg	esg
News	1.622*** (0.058)	1.149*** (0.063)	1.430*** (0.057)	1.025*** (0.063)
Roa			-3.400*** (1.051)	2.735*** (0.927)
Firmage			3.809*** (0.191)	0.575*** (0.195)
Leverage			1.634*** (0.324)	3.068*** (0.349)
Director			0.055*** (0.012)	0.023** (0.011)
Cashflow			4.147*** (0.833)	0.752 (0.768)
Year-fixed effect	No	Yes	No	Yes
Industry-fixed effect	No	Yes	No	Yes
Observation	10830	10830	10830	10830
R-squared	0.077	0.286	0.132	0.292

Standard errors in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$ (The same below).

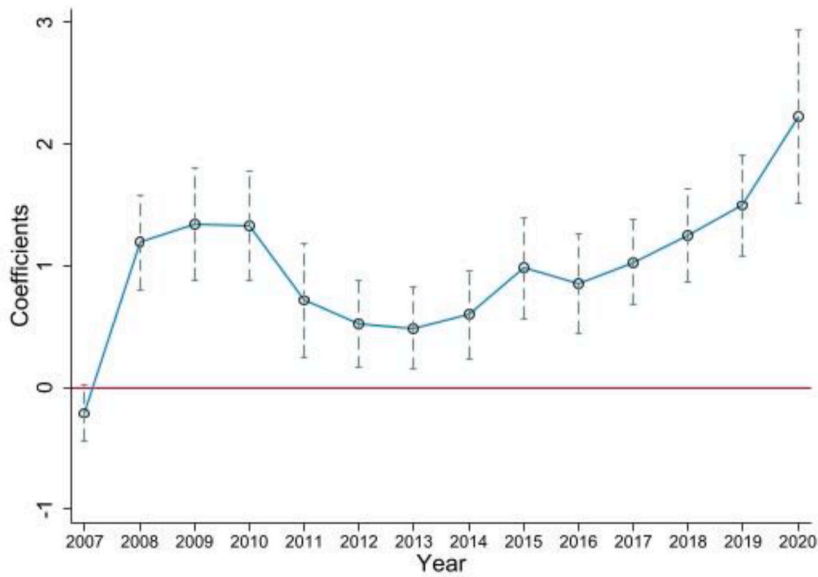


Fig. 2. Dynamic effects.

on corporate ESG, as shown in Columns (1) and (2) of Table 3. The findings indicate that at 1 % level of significance, both online and print media attention have significantly positive impact on corporate ESG performance, and the coefficient value of print media attention is larger. It indicates that after differentiating the type of media coverage, media attention still exhibits an enhancing effect on corporate ESG. With the development of the digital economy, the Internet has become an important channel for people to obtain information. However, compared to online information, print media is considered more formal and carries higher credibility. It therefore exerts greater influence on corporate behavior.

Secondly, media as an information intermediary exerts varying effects on public opinion and corporate reputation through its positive and negative coverage, thus influencing corporate ESG performance differently. Therefore, we categorize media coverage into

Table 3
Further analysis.

	(1)	(2)	(3)	(4)	(5)	(6)
	esg	esg	esg	esg	esg	esg
PressNews	0.657*** (0.072)	0.600*** (0.072)				
NetNews	0.487*** (0.098)	0.430*** (0.097)				
PosNews			1.167*** (0.121)	1.135*** (0.124)		
NeuNews			0.324*** (0.117)	0.318*** (0.116)		
NegNews			-0.280** (0.111)	-0.356*** (0.112)		
Press_PosNews					0.859*** (0.113)	0.804*** (0.113)
Net_PosNews					0.534*** (0.114)	0.538*** (0.116)
Press_NeuNews					-0.114 (0.103)	-0.083 (0.103)
Net_NeuNews					0.211* (0.116)	0.212* (0.116)
Press_NegNews					-0.023 (0.112)	-0.075 (0.111)
Net_NegNews					-0.264** (0.115)	-0.300*** (0.116)
Year-fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Industry-fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Control Variables	No	Yes	No	Yes	No	Yes
Observations	10830	10830	10830	10830	10830	10830
R-squared	0.2895	0.2951	0.2896	0.2957	0.2945	0.2998

positive news (*PosNews*), neutral news (*NeuNews*), and negative news (*NegNews*), examining their impact on corporate behavior. Specific results in Columns (3) and (4) of [Table 3](#) indicate that positive and neutral news have positive coefficients on corporate ESG, significant at the 1 % level. Positive news has a larger coefficient. Conversely, negative news demonstrates adverse effects on corporate ESG performance, highlighting significant differences in how different media sentiments impact corporate ESG performance. Positive and neutral coverage potentially enhances corporate reputation and social acceptance, thereby motivating further efforts in environmental, social, and governance aspects [66]. However, negative coverage may attract public and regulatory scrutiny, leading to compliance pressures, reputational damage, and potential negative economic impacts for firms. These findings contribute to existing research on the relationship between media attention and ESG practices among Chinese firms [64].

Furthermore, we analyze the impact of different media sentiments on corporate ESG. According to the estimates in Columns (5) and (6) of [Table 3](#), both positive coverage from print (*Press_PosNews*) and online media (*Net_PosNews*) shows significant positive effects on corporate ESG ratings, with greater impact of positive coverage from print media. Neutral coverage from online media (*Net_NeuNews*) exhibits a weak positive impact. However, neutral and negative coverage from print media (*Press_NeuNews*; *Press_NegNews*) do not show significant effects. In contrast, negative sentiment from online media (*Net_NegNews*) has a greater and more significant impact. This underscores the broader reach and greater influence of online media, where negative coverage can quickly attract public and investor attention, leading to more significant negative impacts on corporate reputation and increased business risks. Firms may need to allocate substantial resources to address these pressures, potentially diverting attention from long-term ESG strategies and goals, thereby impacting corporate ESG performance negatively.

4.3. Robustness tests

- (1) Changing the explanatory variable. In the baseline analysis, we measure media attention using the total number of news contexts featuring a company in both online and print media. Considering differences in media reporting styles and frequency, we take the logarithm of one plus the count of news articles where a company's name appears in the titles (*News_title*) to gauge media attention. Furthermore, accounting for news originality, we use the logarithm of one plus the count of original news contexts (*News_origin*) to represent media attention. Columns (1)–(4) in [Table 4](#) present the results. It is evident that all coefficients are positive and statistically significant at the 1 % level. Changing the measure of media attention does not affect the core conclusions of this study, which highlight the positive impact of media attention on corporate ESG responsibilities.
- (2) Changing the dependent variable. To assess the elasticity of media attention on ESG performance, we further log-transform the ESG ratings. According to Columns (5) and (6) in [Table 4](#), the estimated coefficients for media attention are statistically significant at the 1 % level. From an economic standpoint, a 1 % increase in media attention is associated with an average 0.046 % improvement in corporate ESG ratings.
- (3) Endogeneity concerns. Firms with either strong or poor ESG performance may attract media attention, potentially biasing the conclusions of this study. To address endogeneity concerns stemming from reverse causality and omitted variables, this paper employs instrumental variable (IV) analysis. The instrumental variable selected is the level of media development in the province where the company operates, measured by the ratio of total newspaper and periodical publications to the total population.

On one hand, a higher per capita total publication volume indicates broader media coverage and more active information dissemination, correlating with the number of media reports. On the other hand, provincial media development level serves as a geographic and economic factor reflecting overall media activity and information dissemination capacity in the region. It is unlikely to directly influence corporate ESG performance or be influenced by corporate ESG practices, thus satisfying exogeneity. [Table 5](#) presents the results of the first and second stages of the IV analysis. It shows that even after addressing endogeneity concerns, media attention continues to demonstrate a positive effect on corporate ESG responsibilities at 1 % significance level.

Additionally, to mitigate the impact of outliers, all variables undergo 1 % winsorization. Province fixed effects are included, and

Table 4
Robustness tests.

	(1)	(2)	(3)	(4)	(5)	(6)
	esg	esg	esg	esg	lnesg	lnesg
News_title	0.611*** (0.057)	0.507*** (0.057)				
News_origin			1.440*** (0.070)	1.315*** (0.070)		
News					0.052*** (0.003)	0.046*** (0.003)
Year-fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Industry-fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Control Variables	No	Yes	No	Yes	No	Yes
Observations	10830	10830	10830	10830	10830	10830
R-squared	0.2678	0.2781	0.2926	0.2981	0.3438	0.3503

Table 5
IV regression results.

	(1)	(2)
	first stage	second stage
Media	0.035*** (0.012)	
News		15.877*** (5.495)
Year-fixed effect	Yes	Yes
Industry-fixed effect	Yes	Yes
Control Variables	Yes	Yes
Observations	10830	10830

standard errors are clustered at both the provincial and industry levels for further tests. The conclusions of this study remain robust, and detailed results are provided in [Table A](#) in the appendix.

4.4. Mechanism analysis

According to the above analysis, media attention helps to promote corporate ESG performance. In order to investigate the mechanism of media attention on corporate ESG, we empirically test Equations (2) and (3) with corporate environmental investment and green innovation as the mechanism variables, respectively. [Table 6](#) displays the results. Columns (1) and (2) test whether corporate environmental investment serves as the impact mechanism, whereby it is indicated that media attention has a positive and statistically significant impact on corporate environmental investment at the 1 % significance level. In addition, corporate investment in environment also exhibits a significant enhancement impact on ESG performance, implying that heightened media attention prompts enterprises to adjust their investment strategies by increasing environmental investment [57], with the aim of cultivating a positive image and bolstering public reputation.

For the other mechanism, according to the results presents in Columns (3) and (4) of [Table 6](#), media attention exhibits an incentive effect on green innovation of enterprises, and the coefficient of green innovation on ESG performance is also positive and statistically significant at the 1 % level. This implies that as media attention increases, enterprises adapt their long-term production decisions and innovation strategies to react positively to media spotlights. They enhance green innovation efforts [42] and inject new momentum to improve ESG performance, thereby ensuring long-term efficiency and sustainable development. In summary, media attention can achieve a positive incentive effect on corporate ESG responsibility by increasing corporate environmental investment and promoting corporate green innovation, thus validating the second Hypothesis.

5. Heterogeneity analysis

5.1. Enterprise size heterogeneity

In addition to positive incentives for enterprises to fulfill their ESG responsibilities, public perceptions and evaluations guided by media reports can exert public opinion pressure on enterprises. This motivates them to seek a reversal in public sentiment, aiming to establish a favorable image, thus taking more aggressive but short-sighted actions to compensate for the negative impact brought by media attention. Enterprises of different sizes possess different economic and technical foundations [60] and encounter distinct green transformation costs. As a result, the responses of enterprises with different scales to media attention are heterogeneous. To examine how firm size affects the impact of media attention, we divide the sample into large and small firms based on the median total assets, and interact them with media attention variable.

Table 6
Mechanism analysis.

	(1)	(2)	(3)	(4)
	Ep	ESG	Gpat	ESG
News	0.336*** (0.065)		0.172*** (0.011)	
Ep		0.176*** (0.027)		
Gpat				1.127*** (0.079)
Year-fixed effect	Yes	Yes	Yes	Yes
Industry-fixed effect	Yes	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes	Yes
Observation	4198	4198	10830	10830
R-squared	0.175	0.301	0.260	0.291

As shown in Column (1) of Table 7, the results indicate that media attention has a significant positive effect on both types of firms at the 1 % level, with a larger estimated coefficient for large-scale firms. This suggests that media attention provides stronger positive incentives for large firms to fulfill their ESG responsibilities, while smaller firms, with weaker abilities to balance stakeholder interests, may experience diminished effectiveness of media attention, thereby validating Hypothesis 3a. Based on these findings, as media becomes more developed and information more transparent, large firms should leverage their developmental and economies of scale advantages to invest in ESG initiatives actively. This transformation can help drive sustainable development in production methods. Small firms, meanwhile, should also focus on long-term development and take proactive steps to fulfill their responsibilities.

5.2. Enterprise internal control quality heterogeneity

The extent to which enterprises fulfill their ESG responsibilities is related to corporate culture and the quality of internal governance. Moreover, the efficiency of resource deployment and the ability to effectively manage and coordinate the interests of all parties within the firm are closely linked to internal control. Therefore, the quality of corporate internal control has a greater effect on the attitudes and measures taken by the enterprises in response to media attention. Aiming to explore the heterogeneity of media attention on corporate ESG performance owing to various internal control quality, we split the whole sample into enterprises with high internal control quality (High-IC) and low internal control quality (Low-IC) based on the corporate internal control index from the DIB database, which can comprehensively reflect the level of internal control and risk control ability of listed companies.

The specific regression results are shown in Columns (2) of Table 7, whereby it indicates that media attention has a positive effect on both types of enterprises at a significant level of 1 %. However, comparing the coefficient estimates reveals that for firms with higher internal control quality, the impact of media attention on ESG improvement is greater, at 1.037, compared to 0.855 for firms with lower internal control quality. This suggests that enhancing internal control quality strengthens the incentivizing effect of media attention on corporate ESG responsibilities, confirming Hypothesis 3b. Faced with media scrutiny, enterprises with stronger internal controls typically build public reputation through fulfilling ESG responsibilities [62], to manage and mitigate the impact of media coverage [63]. Hence, firms should attach importance to internal governance, strengthen risk management capabilities, and improve coordination efforts to proactively respond to media attention, thereby contributing to achieving corporate goals of sustainable green development and maximizing social welfare.

5.3. Regional and industry heterogeneity

Due to the industry differences in ESG focus [67], and varying green development patterns across regions [68], this study explores the heterogeneous impacts of media attention on corporate ESG performance based on geographical and industry characteristics. Firstly, the sample is divided into manufacturing and other sectors, and interacted with the media attention index. Column (3) of Table 7 presents the results. The findings reveal that media attention significantly enhances ESG performance across enterprises in different industries, meeting a 1 % significance level. The positive impact is notably stronger for manufacturing firms, reaching 1.244. This could be attributed to stricter environmental and social responsibility demands faced by manufacturing firms, where media

Table 7
Heterogeneity tests.

	(1) size	(2) control	(3) industry	(4) region
News*small	0.340*** (0.065)			
News*big	0.867*** (0.060)			
News*lowIC		0.855*** (0.064)		
News*highIC		1.037*** (0.062)		
News*manufacture			1.244*** (0.083)	
News*others			0.754*** (0.077)	
News*east				1.071*** (0.063)
News*central				0.891*** (0.066)
News*west				0.909*** (0.068)
Year-fixed effect	Yes	Yes	Yes	Yes
Industry-fixed effect	Yes	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes	Yes
Observation	10830	10830	10830	10830
R-squared	0.323	0.297	0.293	0.296

scrutiny and reporting effectively prompt improvements in environmental protection measures and social responsibility practices to address pressures from the public and regulatory agencies. Moreover, manufacturing activities exert significant environmental and social impacts, leading to higher media exposure. Under public scrutiny, firms are more inclined to enhance their ESG performance to uphold their corporate image and brand reputation. Therefore, policymakers should consider industry-specific differences when formulating targeted policies and measures to promote sustainable development and corporate social responsibility across various sectors. Strengthening media oversight and fostering collaborative efforts could facilitate higher-quality economic development and social progress.

Secondly, the sample is segmented into Eastern, Central, and Western regions based on the geographical location of firms, interacted with the media attention index, as shown in regression results in Column (4) of Table 7. The outcomes indicate that media attention enhances corporate ESG ratings significantly at a 1 % significance level across different regions. However, the marginal impact is more pronounced in the Eastern region, followed by the Western region, with relatively lower effects observed in the Central region. The Eastern region, characterized by economic development, extensive media coverage, and rapid information dissemination, sees enterprises enhancing their ESG performance more prominently under increased media scrutiny to maintain reputation and competitive advantage. In contrast, the Central and Western regions should leverage media's role in public oversight to highlight and address non-compliant enterprises, fostering positive public opinion and encouraging active corporate ESG responsibility to promote sustainable development.

6. Conclusions

At China's critical period of high-quality economic transformation, it is crucial that enterprises, as important subjects of national economic development, pursue the maximization of their own interests while enhancing responsibility awareness. By proactively balancing public interest, environmental protection and governance effectiveness, enterprises improve ESG performance to foster a business environment conducive to all stakeholders, effectively advancing the transformation of green economy. Researches have been conducted mainly from policy-based institutions to examine the external driving force of corporate fulfillment of ESG responsibility. As an important informal institution, some studies have considered the role of media in corporate governance and social development, yet no consistent conclusion has been reached, and little literature has explored the relationship, mechanisms and conditionality governing media attention and corporate ESG fulfillment in the context of developing countries with emerging ESG market.

Based on this, we measure media attention by the amount of media reports as a breakthrough point to explore the external and internal paths for enterprises to boost their ESG performance beyond the policy system. The findings can be concluded that, firstly, media attention can effectively motivate corporate ESG performance in China. Differentiating the type of media and the nature of coverage, we find that print media attention has a greater incentive effect, while negative coverage outperforms negative in improving ESG performance. Secondly, media attention has an incentive effect on ESG performance mainly by prompting heightened environmental investment and green innovation. Finally, large enterprises and those with superior internal controls are more likely to respond to media pressure with positive attitudes and initiatives, mainly perceiving attention as positive incentives, while media attention mainly exerts "market pressure" effects on small firms and limited positive incentives for enterprises with lower quality internal controls. For enterprises in the eastern region and manufacturing sector, media attention has a greater effect on improving their ESG ratings.

This paper has the following insights: First, the monitoring and motivating effects of media attention on corporate ESG performance reveal that responsible corporate development cannot be promoted by government policies alone, but we can consider introducing additional external governance mechanisms like media monitoring, harnessing the hotspot and timeliness of media for tracking corporate ESG-related news and achieving monitoring and restraint on corporate performance. Through public awareness and evaluation guided by media spotlight, enterprises can be motivated to fulfill ESG responsibilities for green production transformation. Further efforts could explore more motivational factors to improve corporate ESG performance and fill regulation gaps. Secondly, media should uphold the principle of truthfulness and objectivity, strengthen the attention to the environmental information and social behavior of enterprises, avoid the "greenwashing" behavior of enterprises, thereby maximizing the positive incentive for enterprises to fulfill their responsibilities while dampening market pressure effects. Additionally, given the differences in enterprise size and internal control quality, public should enhance oversight of firms' behavior. Large enterprises and those with high internal control quality should leverage their scale, resource allocation, and coordination capabilities to increase environmental investments and develop green innovations, thereby reinforcing the role of media supervision. Small enterprises and those with lower internal control quality should improve self-management and adopt proactive measures to handle media pressure, contributing to green production transformation and sustainable development. Finally, policymakers should consider industry and regional differences, devising more targeted policies and measures. Strengthening media supervision and fostering collaboration between the government and the public can promote sustainable development and corporate social responsibility across all types of enterprises, leading to higher quality economic growth and social progress.

Limitations

Due to data limitations, this work only focuses on the sample of listed companies in China. Because of the imperfect information disclosure mechanisms of unlisted companies, media attention may have different impacts. Future research could extend the application of ESG indices to unlisted companies and examine the impact of media on these enterprises. Additionally, further exploration could investigate how firms in different industries and regions respond to various media reports and how these differences affect their

ESG performance. Such research would provide more detailed data and theoretical support for developing more targeted media management strategies for enterprises. Furthermore, studies could focus on the application of emerging media forms and technologies in corporate ESG management, such as social media, big data, and artificial intelligence, to explore their potential and challenges in promoting sustainable development in enterprises.

Ethics approval

Not applicable.

Consent

Not applicable.

Data and materials availability

The authors do not have permission to share data.

CRedit authorship contribution statement

Chenhong Zheng: Writing – original draft, Visualization, Formal analysis, Conceptualization. **Fangshun Xiao:** Writing – original draft, Visualization, Resources, Methodology, Conceptualization. **Cong Zeng:** Writing – original draft, Methodology, Formal analysis, Conceptualization. **Sasa Yang:** Writing – review & editing, Writing – original draft, Supervision, Methodology, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix

Table A
Additional robustness tests.

	(1)	(2)	(3)	(4)
	esg_w	esg	esg	esg
News	0.201*** (0.064)	0.970*** (0.063)	1.025*** (0.146)	1.025*** (0.139)
Year-fixed effect	Yes	Yes	Yes	Yes
Industry-fixed effect	Yes	Yes	Yes	Yes
Province-fixed effect	No	Yes	No	No
Cluster			province	industry
Control Variables		Yes	Yes	Yes
Observations		10830	10830	10830
R-squared		0.3217	0.2919	0.2919

Note: Standard errors in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

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