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The Impact of Media Sentiment on ESG Ratings of China's Energy Industry

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Abstract. Within the framework of global climate governance and sustainable development, Environmental, Social, and Governance (ESG) ratings have emerged as a critical indicator for assessing corporate sustainability. This study investigates the dynamic influence of media sentiment on ESG ratings in China's energy industry，a three-dimensional analytical framework of media sentiment is developed to systematically examine the interplay among media discourse, public perception, and corporate sustainability practices. Using quarterly panel data from 139 A-share listed energy companies in China between 2021 and 2024，this study integrates textual mining of CNKI financial press articles with ESG ratings from Huazheng Index. The empirical findings reveal the following: First, both optimistic and pessimistic media sentiment amplify fluctuations in ESG ratings, with the amplification effect being more pronounced in firms with lower information transparency. Second, ESG ratings of new energy firms exhibit greater sensitivity to media sentiment than those of traditional energy firms, underscoring the reputational vulnerability of policy-driven sectors. Third, optimistic sentiment is more likely than pessimistic sentiment to induce irrational upward shifts in ESG ratings, reflecting the asymmetric risk preferences postulated by prospect theory. This research incorporates media ecology theory into the ESG evaluation framework, addressing limitations of conventional financial-data-driven models; it also unveils the heterogeneous effects of media sentiment across different ESG dimensions, offering a theoretical foundation for differentiated governance strategies; and it extending the application frontier of big data methodologies in ESG research for the energy sector.

Keywords: ESG Ratings, Media Sentiment, China's Energy Industry, Information Transparency

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1. Introduction

In light of the growing importance of sustainable development and global climate governance, ESG ratings have become essential tools for evaluating the sustainability efforts of companies. Academics and the general public have turned their attention to the energy sector's environmental, social, and governance (ESG) performance because of the vital role it plays in the world's economies. An increasingly important factor impacting ESG assessments in this strategic sector is the media's dual function as information broker and agenda-setter. To capture the interactions among media coverage, public opinion, and firms' sustainability practices, this study will construct a multi-faceted analytical framework and explore the positive or negative channels through media sentiment can affect energy firms ESG ratings.

In energy, ESG metrics emerge as critical sustainability criteria. The role of the sector in climate change mitigation and sustainable development goals is immense turning attention to environmental footprint, social responsibility, and governance excellence in energy firms even more crucial. Even though external contextual factors, in particular media sentiment dynamics, influence corporate scenarios of sustainability longevity, contemporary ESG rating systems primarily depend on firms' self-reported data and third-party assessments, and fail to account for the aforementioned effects. The construction of social representations of business activity occurs using the media as the main conduit of information, which also mediates the judgment of investors and rating agencies.

The media sentiment-ESG rating nexus is driven by three inter-related mechanisms. Specifically, media framing shapes public sentiment through selective focus and affective tone. Positive coverage could increase corporate reputation and stakeholder trust and thus ESG rating, and negative coverage might intensify the scrutiny of the environment and society commitments, resulting in downgrading of the rating. Media exposure also brings strategic adjustment in corporate decisions where firms upgrade their environmental practices in the face of negative reporting as a way to improve their green image. Third, media discourse would be assumed to influence ratings techniques indirectly through the growing use of ESG evaluators of media monitoring in assessing companies, meaning that such ratings would be exposed to the transmission of media bias throughout the source companies.

Using mixed methods research design, this study develops a three-step analytical framework. (2021-2024), £58,974) Computational text analysis of the media reporting on the energy sector can be used to extract sentiment indicators in two ways.

Second, fixed-effects panel regression models analyze the sentiment-rating relationship across major Chinese energy firms. Complementary case studies elucidate context-specific mediation mechanisms.

This research contributes three substantive innovations: First, it systematically integrates media ecology theory into ESG evaluation frameworks, advancing the theoretical frontiers of sustainability assessment. Second, the developed multidimensional model captures differential media effects across ESG dimensions. Third, it pioneers big data analytic applications in energy sector ESG research, enhancing methodological robustness through machine learning-enhanced sentiment analysis. These contributions not only deepen understanding of the media's constitutive role in sustainability governance but also provide actionable insights for energy firms navigating ESG disclosure challenges.

In this study, we test and find support for three theories. The first theory proposes that the way the media portrays future energy companies' environmental, social, and governance (ESG) performance can change over time. In the second hypothesis, we find that listed energy companies' ESG ratings are more affected by media attitude when their corporate information is not as transparent. To

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explain this, we use a moderating effect to show that this is the case. According to the third hypothesis, media sentiment can be categorized as either positive or negative. It is found that optimistic sentiment has a stronger impact on ESG ratings than pessimistic sentiment. According to the research, renewable energy businesses' ESG ratings are more affected by public opinion than those of conventional energy corporations. The media's impact on conventional energy providers is, for the time being at least, constrained by these fundamental limitations.

2. Literature review and research hypothesis

2.1. Literature review

The theoretical foundation of media sentiment primarily stems from the fields of communication and psychology. The initial studies focused on the effect of media sentiment on public opinion and behavior [1]. In addition, with the development of big data technologies, researchers have more and more used text mining and sentiment analysis to measure media sentiment[2]. In terms of finance, the relationship between media sentiment and stock prices or market volatility have been widely studied which provides solid theoretical evidence to explore the relationship between media sentiment and ESG ratings [3].

The development of the ESG rating system has gone from being `an environmental index' to a complete evaluation frame. This subjected us to an initial wave of studies on environmental performance and subsequent to social responsibility and corporate governance [4] [5]. Currently, major ESG rating agencies (e.g., MSCI, Sustainalytics, and Refinitiv) have their own evaluation systems but substantial inconsistency still exists in their methodologies and criteria [6]. This discrepancy may be cause for ESG ratings correlation with media sentiment to differ.

“In the energy space, this differentiation stands out in environmental and social performance.” Statements Research shows a strong relationship between the environmental performance of energy businesses and their financial performance [7]. Likewise, social responsibility actions of oil companies have a direct impact on stakeholders [8]. These attributes make ESG scores in the energy sector particularly sensitive to media coverage and public sentiment.

In terms of the channels via which media sentiment affects ESG ratings, previous research has mainly discussed three channels: information conveyance, stakeholder pressure, and corporate conduct. Informational transmission is also driven by the media, which influences the perceptions of investors and analysts leading to variation in ESG ratings [9]. The stakeholder pressure factor emphasizes that media sentiment may amplify public and regulatory attention on firms, impacting rating [10]. Finally, the corporate behavior dimension focuses on the extent to which media sentiment influences corporations’ ESG-related choices [11].

Empirically, such a judgment comes to differing results between researchers. Some of these scholars find that negative media sentiment is negatively associated with a firm’s ESG rating [12], while others have discovered that moderate amount of negative coverage may lead firms to enhance their ESG performance, and hence improve ESG ratings [13]. Differences in study designs, time frames, and measurements of media sentiment likely explain this inconsistency. Stock prices are more likely to deviate from their fundamental value levels when news headlines spread strong media sentiment, according to research rooted in the spiral of silence theory. Furthermore, media tone towards the mispricing of assets is escalated when company transparency is lacking. Further, the media depiction of emotions has different effects on asset mispricing, and so media sentiment effects are not symmetrical; for instance, an optimistic media coverage can drive stock prices upwards, thus giving rise to a bubble.

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In summary, extant literature provides a strong foundation worthy of exploring the impact of public opinion on ESG ratings of energy companies. But the existing studies still have several limitations: To begin, the energy companies in emerging markets receive too little attention from research looking at mature markets. Moreover, little is known about the influence of public opinion upon ESG ratings.

Furthermore, there is a lack of research on the impact of new types of media, such social media. Future study should focus on addressing these constraints.

2.2. The impact of media sentiment on the ESG ratings of energy companies

According to the efficient market hypothesis and information transmission theory, the media, as a key node in information dissemination, can influence the expectations of investors and other stakeholders. Optimistic media sentiment creates positive outlook expectations, potentially attracting more investors to focus on listed energy companies, prompting them to optimize their ESG practices to maintain a good image, thus promoting ESG ratings. Pessimistic media sentiment leads to negative outlooks; in response to public opinion pressure, companies may adjust their business strategies to improve ESG performance and restore their reputation, or negative public opinion may affect rating agencies' evaluations, resulting in lower ESG ratings. These expected changes compel companies to adjust strategic decisions and resource allocation to meet external expectations. Since ESG ratings consider various operational practices, changes in strategy and resources will inevitably lead to changes in ESG practices, causing rating fluctuations. Based on the above analysis, this paper proposes the following hypothesis:

H1. The more optimistic or pessimistic the media sentiment, the more likely the ESG rating level of listed companies in the energy industry will fluctuate in the future.

2.3. Moderating effect of information transparency

Because of factors including identification, belonging, and information costs, studies in social psychology have shown that investors demonstrate persistent herd behavior by giving up important private information and following the market's majority strategy [14]. Gaining timely insights into the firm's genuine business conditions becomes especially tough when the information environment is weak. Public sentiment, market rumors, and informal communication networks are examples of low-cost, fast information conduits that investors rely on more in these situations. Because of this, the media's impact on investors is magnified.

Media outlets, on the one hand, are trustworthy information sources for investors because of their vast reach and authority. Recognition, imitation, and even pursuit of the views expressed by the media as authoritative perspectives are commonplace. Conversely, news releases have the potential to spread illogical market sentiment as a result of contagion effects and investors' tendency to follow the crowd. When these elements come together, investors who are unsure of what to do often end up following the herd mentality fostered by the media. Investing becomes more herdish as a result, which can lead to widespread market chasing and a widening gap between stock prices and their true worth as well as an increase in asset mispricing. This paper presents a hypothesis based on the analysis that was done above:

H2. The lower the transparency of corporate information, the more significant the impact of media sentiment on the ESG of listed companies in the energy industry.

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2.4. The differential effects of pessimistic and optimistic emotions

Investors' responses to news items can be driven by media sentiment, which can cause them to act irrationally. For example, when the media is very positive, stock prices might rise excessively, and when the media is very negative, stock prices can decrease excessively. Psychological studies have demonstrated that investors have an unbalanced reaction to information, with a larger reaction to bad news compared to good news. For example, according to the prospect theory put forth by Kahneman and Tversky in the field of behavioral economics, investors display different behaviors based on the type of information they are presented with [15]. When faced with the prospect of losses, they are more inclined to take risky bets, known as risk-seeking, and when faced with the prospect of profits, they are more likely to prefer certain gains, known as risk-averse. Thus, negative mispricing occurs when investors react more strongly to media pessimism than positive media and modify their perceptions of a company's stock, leading to larger price drops.

Common financial derivatives utilized to mitigate risk in developed Western markets, including options, stock futures, or index futures, are still in their infancy in China owing to the flawed bilateral or short-selling methods in the country's stock trading market. Limited futures trading variety and high margin trading thresholds (such as the requirement for a high proportion of margin deposits) have kept China's short-selling mechanism underdeveloped since March 31, 2010, when pilot margin trading began, and April 1, 2010, when stock index futures trading was officially launched. Consequently, investors typically gain solely from increases in share prices. This facilitates the process by which investors, encouraged by upbeat news coverage, drive up stock prices. On the other hand, limitations on short selling might make media-induced pessimism less of a factor in stock price overreaction.

Miller adds that the market is controlled by optimistic investors because pessimistic investors are pushed out by short-selling prohibitions and heterogeneous beliefs [16]. Excessive price increases might occur as a result of a "herd effect" when the media expresses a very positive outlook that coincides with the optimistic psychological expectations of market leaders. This publication presents two competing theories based on the analysis presented above:

H3a. Compared with optimistic media sentiment, pessimistic media sentiment is more likely to lead to increased ESG rating volatility, that is, the more negative ESG rating volatility is.

H3b. Compared with pessimistic media sentiment, optimistic media sentiment is more likely to lead to increased ESG rating fluctuation, that is, the higher the positive ESG rating fluctuation is.

2.5. The correlation between ESG rating fluctuations and stock price fluctuations

ESG ratings – critical for investors to assess a company’s sustainability credentials especially in the energy sector where environmental (E) and social (S) performance has a major influence on corporate reputation and business risk. It is suggested by researchY1 this impacts investor expectations on future business performance [5], that changes in ESG ratings present significantly valid signals to market. Sharp oscillations in ESG ratings may prompt investors to reevaluate the long-term value and level of risk associated with the company and create stock price volatility. ESG rating changes can also indirectly lead to stock price volatility through changes in investor reaction and behavior. Evidence indicates that negative news messages related to low ESG performance of a company may raise investors’ risk aversion and thereby trigger capital withdrawal and decrease in stock prices [12]. Moreover, ESG rating changes might affect how institutional investors allocate assets, which, in turn, might lead to a lower demand for your equity and a higher stock price volatility.

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The energy industry is strictly regulated by environmental and social responsibility because it has clear, well-documented environmental effects and has heightened sensitivity to social responsibility. Changes in ESG ratings could therefore indicate shifts in the type of future REG that companies are likely to receive, which could exert a strong influence over stock prices. The environmental track record (e.g., carbon emissions, renewable energy investments) and social responsibility (e.g., community work, labor rights) of energy producers can be extremely beneficial or detrimental to their survival and operating permits [7]. As a result, changes in ESG ratings may be considered by the market as significant new information about a company's environmental or social responsibility risk, leading to a sharp response in stock prices.

One important factor that we need to consider is the role played by the media in the association between the risk ESG score changes and the stock price volatility. Media response to ESG events may multiply the market response (particularly in the energy industry, where negative ESG news, such as environmental contamination or safety accidents, frequently result in the release of a high level of public concern and investor sentiment [9]. This amplification impact may induce a further enhancement in the positive relationship between ESG rating changes and stock price volatility.

3. Research design

3.1. Sample selection

All A-share businesses trading on the Shanghai or Shenzhen stock exchanges between Q3 2021 and Q3 2024 make up the sample. The information used in the media reports comes from three major financial newspapers in China that are part of CNKI's "China Important Newspapers Full-text Database": Securities Times, China Securities Journal, and Securities Daily. Obtain news reports that include the company's stock abbreviation by using search algorithms with an ESG topic. Companies that aren't in the samples are those that don't have complete trade or financial data, aren't listed on financial markets, or have missing data from media reports. A shortened version of the data is shown for the top and bottom 1%. The research period is chosen taking into account the features of the Chinese stock market and the impact of media news on stock prices in relation to their timeliness. In the end, over the course of 12 quarters, we were able to collect 15,895 pieces of text data from 71 listed traditional energy firms and 49,674 pieces of text data from 68 listed new energy companies. This study uses data from the CSMAR data library for the financial and other corporate characteristics that were chosen for inclusion, and data from the Wind database for the ESG ratings of those companies.

3.2. Media sentiment index measures

This study constructs a comprehensive media sentiment evaluation system based on three dimensions: First, the "reporting tone" dimension aims to analyze the media's attitude towards the company, including optimistic, neutral, or pessimistic tendencies, which is considered a key indicator in determining media sentiment; second, the "exposure level" dimension focuses on the intensity and continuity of news coverage, quantified by the number of news articles; and finally, the "attention level" dimension pays attention to the appeal of news coverage to readers. Clearly, the stronger the appeal of the news coverage, the more significant the media sentiment conveyed.

In the evaluation system, a three-tier scoring method was adopted: if the company's name appears in the news headline or as the main subject of an in-depth report, a score of 3 is given; if the

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company's name is mentioned more than three times in other reports, a score of 2 is given; in other cases, a score of 1 is given.

The media sentiment index is calculated through a formula:

$$SENTIMENT_{j.t} = \sum_{1}^{n} Tone_i \times Attention_i$$

Among them, $\mathrm{Tone_i}$ represents the tone of the report, $\mathrm{Attention_i}$ represents the degree of concern, and n represents the number of reports. The larger the value, the more optimistic the media sentiment.

Finding a reliable and impartial way to evaluate news reports' tones is the article's biggest obstacle. Existing research indicates that textual content analysis is the most popular and well-known method in academics. Two subsets exist within this approach: computer recognition and human reading. By quantitatively examining the frequency of positive and negative terms in news reports, the computer recognition approach can establish the media's attitude trend.

This article opts to employ text sentiment analysis based on a sentiment dictionary to delve deeper into the emotional evolution trend and propensity of news reporting. Crawling news texts about environmental, social, and governance (ESG) issues in this article starts with the crawler's initialization settings, which include configuring user agents and other request header information to behave like a regular browser, making sure the crawler commands are valid. The crawler retrieves results from three media reporting websites' databases by utilizing the Request function of the Scrapy framework. In order to precisely extract the necessary long text data of company news, Scrapy uses its built-in XPath and CSS selectors to parse the response data. Using the Python NLP tools; this post delves into the three data sources' coverage of the chosen company's ESG issues in reporting. For the purpose of ensuring the data is accurate and consistent, jieba is initially utilized for text preprocessing throughout research. This includes tasks such as Chinese word segmentation, stop word removal, and text normalization. Next, the sentiment analysis function examines the 65569 news articles that have been segmented using Chinese words. It compares these articles to four-word files from the "CNKI How Net Sentiment Dictionary": "Positive Sentiment Words (Chinese)", "Negative Sentiment Words (Chinese)", "Positive Evaluation Words (Chinese)", and "Negative Evaluation Words (Chinese)". Then, it calculates the sentiment score for each news article using a 5-level symmetric scoring method, with negative values assigned as -2, -1, 0, 1, 2, 1. The result is a new set of sentiment scores. The data shows that there are 42619 reports of positive emotion, 9835 reports of neutral mood, and 13115 reports of negative sentiment.

3.3. Opacity index measures

The transparency This metric shows how opaque the company's statistics are. To find out if the connection between ESG ratings and media sentiment is impacted by the company's information environment. Using the methodology of Hutton et al. as a guide, we use the Jones Modified Model to predict industry- and business-specific manipulable accruals, and then average the absolute values over three years to find out how open a company is with its public data [17].

$$\mathrm{Opacity} = \mathrm{Abs}\left(\mathrm{DisAcc_{t-1}}\right) + \mathrm{Abs}\left(\mathrm{DisAcc_{t-2}}\right) + \mathrm{Abs}\left(\mathrm{DisAcc_{t-3}}\right)$$

The larger the value of this indicator, the higher the opacity of company information. To empirically analyze Research Hypothesis 2, we introduce the interaction term of media sentiment and information opacity while controlling for information opacity: $Mood_{i,t} \times Opacity$.

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3.4. Variable measurement

1. Dependent Variable:

Enterprise ESG Rating (ESG_r). The annual average of the Huazheng ESG rating is selected as the explanatory variable. According to the nine rating levels from C to AAA in ascending order, corresponding numerical values from 1 to 9 are assigned. The higher the value of this variable, the better the ESG rating of the company.

2. Independent Variable:

Media Sentiment Index ($SENTIMENT_{j.t}$).

2. Control Variables:

Referring to Liu Jianqiu et al. [18], this paper controls for firm-level variables such as firm size, stock price, debt-to-asset ratio, return on total assets, and corporate transparency. The names, symbols, and specific definitions of each variable are shown in Table 1.

Table 1: Table of notations

Variable Name	Variable Symbol	Variable Definition
Enterprise ESG Rating	ESGr	The ESG rating of China Securities is assigned a scale of 1 to 9 according to nine rating scales from C to AAA from low to high.
Media Sentiment Index	Sentimentj. t	A comprehensive evaluation system of media sentiment was constructed from three dimensions: report tone, exposure and attention level
Stock price	$Price$	The closing price at the end of the previous quarter
Company size	Size	The natural logarithm of total assets at the end of the year
The degree of company information opacity	$Opacity$	The Jones modified model is used to estimate the company's manipulable accruals and is averaged over 3 consecutive years of absolute values
Leverage Ratio	LEV	Total liabilities divided by total assets.
Return on Assets	ROA	The ratio of net profit to total assets at the end of the year

3.5. Model specification

This paper establishes the following benchmark regression models to test research hypotheses H1、H2and H3 (a, b):

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$$ESGr_{i\,t+1} = \beta_0 + \beta_1 Mood_{i\,t} + \beta_2 Mood_{i,t} \times Opacity + \sum \beta_{2+j} CV_{j,i,t} + \varepsilon_{i,t}$$

This research adopts the strategy of You Jiaxing and Wu Jing and delays the explanatory and control variables by one period to reduce the effect of endogeneity due to bidirectional causality [19].

There are primarily two potential sources of endogeneity bias in this study: First, there's the issue of endogeneity, which arises when the explanatory and explained variables interact with one another. By using what is known as the "lead-lag approach" to empirical research, this paper looks at how the present media sentiment index affects the ESG rating in the subsequent era. And secondly, the issue of endogeneity that arises from missing variables. The truth is that news about firms is always breaking, and this news causes shifts in both the media mood index and ESG ratings. The endogeneity problem becomes more complex when these factors are not included since it is difficult to determine the impact of each occurrence and to trace them back to each organization within the research window. We deal with this by accounting for individual fixed effects (FIRM) and quarterly fixed effects (QUARTER).

4. Literature review and research hypothesis

4.1. Descriptive statistics

From the descriptive statistics of the media sentiment index, it can be seen that although the media generally presents a positive tone when reporting on listed companies (with a mean of 4.368 and a median of 3), there are also some negative, critical, and skeptical news reports (with a minimum value of -15).

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Table 2: Descriptive statistics

Variable	N	Mean	SD	Min	p50	Max
ESGr	1,389	4.193	1.172	0	4	7
Sentiment	1,389	0.437	4.244	-6	2	6
Size	1,389	23.69	1.380	20.84	23.55	28.27
Price	1,389	23.30	48.09	1.180	10.30	642.3
ROA	1,389	2.906	4.230	-21.39	2.077	27.73
LEV	1,389	52.47	16.93	4.237	54.11	97.19

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Table 3: Regression analysis of media sentiment on corporate ESG scores

VARIABLES	Full Sample	Positive	Negative	Regulating Effect
	ESGr	ESGr	ESGr	ESGr
Sentiment	0.026***	0.205***	-0.069	-0.003
	(0.008)	(0.033)	(0.057)	(0.016)
Opacity				-1.496**
				(0.583)
Opacity × Mood				0.243**
Size	-0.089	-0.094	0.258	-0.060
	(0.115)	(0.173)	(0.158)	(0.129)
Price	-0.002**	-0.000	-0.002	-0.001
	(0.001)	(0.001)	(0.002)	(0.001)
ROA	0.018*	0.012	0.026**	0.022**
	(0.010)	(0.014)	(0.012)	(0.009)
LEV	0.004	0.004	0.013*	-0.002
	(0.004)	(0.006)	(0.008)	(0.004)
Constant	6.058**	5.647	-3.253	5.750*
	(2.750)	(4.162)	(3.868)	(3.033)
Observations	1,389	872	517	758
R-squared	0.670	0.507	0.882	0.852
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

4.2. Robustness check

Tool variable

There is a non-random selection process in place, thus the benchmark regression results could be due to shared characteristics or shifting business trends in the sample. To solve this problem and improve the accuracy of causal identification results, this research uses the propensity score matching (PSM) method. This method reduces the influence of sample self-selection bias. Results of re-regression of sample pairs following matching using one-to-one (with replacement) closest neighbor, kernel, and radius approaches are displayed in Tables (1)–(3), in that order. Consistent with previous findings, there is still a strong positive association between the media mood index and the ESG rating of firms.

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Table 4: Results of the instrumental variables method

	Tool variable phase one regression results	Tool variable second phase regression result
VARIABLES	ESGr	ESGr
L.sentiment	0.656***	
	(0.021)	
Size	0.274***	0.386***
	(0.071)	(0.023)
Price	0.003	0.000
	(0.002)	(0.001)
ROA	-0.022	-0.019**
	(0.024)	(0.008)
LEV	0.001	-0.003
	(0.005)	(0.002)
Sentiment		0.131***
		(0.010)
Constant	-6.411***	-4.801***
	(1.584)	(0.513)
LM statistic		586.861***
Wald F statistic		1011.831***
Observations	1,389	1,389
R-squared	0.457	0.310
firm fe	yes	yes
year fe	yes	yes
F	232.3	145.7

4.3. Heterogeneity test

Industry Heterogeneity Test

After running an industry heterogeneity test, the researchers in this study discovered that the old energy industry and the new energy business were significantly different in how the media sentiment index affected ESG ratings. To be more precise, the media sentiment index had a highly significant positive promotion effect on the ESG ratings of the new energy business, but had no such effect on the old energy industry. It is possible that the operational features and external attention discrepancies between the two categories of industries are to blame for this discrepancy: Since it is a policy-driven sector, the new energy business is more dependent on the trust of the public and

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investors to fund technological advancements, maintain a positive environmental image, and get funding. Rigid demand, long-term policy lock-in effects, and high carbon emission qualities constrain the traditional energy industry, while media attitude directly affects ESG performance through knowledge diffusion and reputation consequences. The ESG ratings of the traditional energy industry are more influenced by the inherent risk framework and regulatory pressure of the industry, and the short-term regulatory effect of the media sentiment is relatively limited. Moreover, stakeholders in the new energy industry are more sensitive to ESG issues, which may strengthen the regulatory role of the media sentiment. The research results reveal that industry attributes are important moderating variables for the relationship between media sentiment and ESG, providing empirical evidence for differentiated ESG governance paths.

Table 5: Industry nature heterogeneity test results

	New Energy	Traditional Energy
VARIABLES	ESGr	ESGr
Sentiment	0.048***	0.010
	(0.009)	(0.012)
Size	0.272*	-0.231
	(0.162)	(0.232)
Price	-0.006	-0.001
	(0.015)	(0.001)
ROA	0.011	0.025
	(0.009)	(0.024)
LEV	0.006	0.003
	(0.005)	(0.009)
Constant	-2.782	9.941*
	(3.786)	(5.520)
Observations	759	630
R-squared	0.770	0.479
firm fe	yes	yes
year fe	yes	yes
F	5.896	1.140

5. Conclusion and discussion

In this study, we look at how the Chinese media portray energy companies' environmental, social, and governance (ESG) ratings. It sheds fresh light on the interplay between press coverage, public

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perception of companies, and sustainability measures. The findings demonstrate that the optimistic or gloomy tone of the media has a substantial impact on ESG ratings. Because new energy companies are more susceptible to reputational shifts brought about by policy changes, the effect is particularly pronounced in this sector. The study also reveals that lower information transparency increases the impact of media sentiment on ESG ratings. When companies have less information available, investors rely more on media coverage, making the companies more sensitive to changes in sentiment.

The analysis indicates that investor reactions to media sentiment are not the same for positive and negative news. Optimistic media sentiment tends to push ESG ratings upwards, while pessimistic sentiment causes greater downward fluctuations. This pattern aligns with prospect theory, which suggests that investors react more strongly to negative news because of loss aversion.

The study's results confirm that more extreme media sentiment, either optimistic or pessimistic, leads to greater fluctuations in ESG ratings. This effect is especially strong when a company has lower transparency. Companies with unclear information are more affected by media sentiment because investors depend more on media coverage. The research also finds that optimistic media sentiment often leads to excessive increases in ESG ratings. Positive coverage creates overly optimistic expectations, causing ESG ratings to rise higher than they warranted.

Furthermore, the study highlights a clear difference between new and traditional energy companies. Media sentiment has a significantly greater effect on the ESG ratings of new energy firms. This is likely due to the higher sensitivity of the new energy sector to public perception and policy, where media sentiment plays a central role in shaping investor behavior and expectations.

This paper contributes to the ESG literature by integrating media theory into ESG evaluation, which helps address the limitations of traditional models that rely on financial data. It also offers theoretical support for differentiated governance strategies by showing how media sentiment affects different ESG dimensions. Additionally, the use of big data techniques improves the accuracy of sentiment evaluation in ESG research, representing an important methodological advancement in the field.

This discussion synthesizes key findings from the study, emphasizing the nuanced influence of media sentiment on ESG ratings within China's energy industry. Media sentiment, as shown, plays a crucial role in shaping corporate sustainability perceptions, particularly for companies with lower transparency. The amplification of ESG rating fluctuations underlines the importance of improving corporate disclosure practices to reduce reliance on potentially skewed media narratives.

The study reveals an asymmetric pattern where optimistic media sentiment triggers stronger upward ESG adjustments compared to the more volatile but less significant declines induced by pessimistic sentiment. This asymmetry reflects investor behavior as predicted by prospect theory, highlighting loss aversion's centrality in driving disproportionate responses to negative news.

Sectoral heterogeneity emerges as an insightful dimension, with media sentiment displaying a heightened impact on ESG ratings in the new energy sector. This is attributed to the sector's dependence on policy incentives and public reputation, making it more vulnerable to sentiment-driven perceptions. Conversely, traditional energy firms exhibit greater resistance to short-term sentiment effects due to entrenched operational models and regulatory frameworks.

Methodologically, this research advances ESG evaluation by integrating media sentiment into conventional financial-data-driven frameworks, applying machine learning to refine sentiment analysis. Future studies should extend these contributions by considering international contexts and incorporating data from dynamic social media platforms. Such advancements promise to deepen

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insights into media-ESG dynamics, informing effective corporate and policy strategies for sustainability governance.

In conclusion, this study enhances our understanding of how media sentiment influences corporate sustainability evaluations. It provides practical insights for energy firms in shaping their ESG strategies and offers recommendations for policymakers seeking to improve media transparency and develop more effective sustainability governance practices.

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