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ESG Rating Divergence and Annual Report Tone Management: Empirical Evidence from Chinese Listed Firms

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Abstract: *In the current process of economic and social development, ESG principles are receiving increasing attention, and discrepancies in ratings assigned by different rating agencies to listed companies' ESG performance are becoming increasingly common. Are company management teams manipulating the tone of their annual reports to mitigate the negative impact of ESG rating discrepancies? To investigate this question, this study employs a sample of non-financial listed companies on the Shanghai and Shenzhen A-share markets in China. Using relevant panel data from 2015 to 2024, it empirically examines the relationship between ESG rating divergence and annual report tone management. Findings reveal a significant positive correlation between ESG rating divergence and annual report tone management, with corporate reputation and investor sentiment partially mediating this relationship. Heterogeneity tests reveal that ESG rating divergence amplifies the extent of annual report tone management more markedly in firms with poorer internal control quality and lower information transparency. These findings enrich the literature on factors influencing annual report tone management, provide robust support for refining ESG rating standards, and offer actionable recommendations for corporate sustainability and investor decision-making.*

Keywords: *ESG rating divergence, annual report tone management, corporate reputation, investor sentiment*

1. Introduction

In recent years, as China elevated its "dual carbon goals" to a national strategy, corporate environmental stewardship has increasingly become a key indicator of sustainable development capability. Against this backdrop, ESG performance has gradually emerged as a crucial dimension for assessing corporate value in capital markets. In March 2025, the China Securities Regulatory Commission issued the revised "Measures for the Administration of Information Disclosure by Listed Companies", mandating for the first time at the departmental regulation level that listed companies disclose sustainability reports. This marks a new phase in ESG disclosure, transitioning from "voluntary standards" to "regulatory compliance". This policy aims to enhance transparency and comparability of information. However, in practice, different ESG rating agencies often assign markedly divergent ratings to the same listed company based on their respective assessment criteria and methodologies (Berg et al., 2022)[1]. This fragmentation of standards not only diminishes the decision-making value of ESG ratings but also widens the information gap between investors and enterprises, fuelling a crisis of market trust.

Annual reports serve as a crucial communication channel between enterprises and stakeholders. Subtle shifts in textual tone can convey management's attitude and expectations regarding the company's current state and future development, exerting a significant influence on investor decision-making. The objective existence of ESG rating discrepancies provides corporate management with operational space for strategic information disclosure, particularly in manipulating the textual tone of annual reports. According to impression management theory, when facing significant internal or external pressures, management possesses an incentive to shape corporate perceptions through linguistic embellishment, thereby guiding stakeholder cognition. Previous research has examined the impact of ESG performance on annual report textual tone (Xu, et al., 2023)[2] and how ESG rating discrepancies influence management's abnormal positive tone, but these studies primarily relied on management discussion and analysis texts (Hao Xiaomin et al., 2024)[3]. Currently, few studies have

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focused on the full-text analysis perspective of annual reports to explore the specific pathways through which ESG rating discrepancies influence annual report tone management.

Therefore, this paper selects non-financial listed companies on the Shanghai and Shenzhen A-share markets from 2015 to 2024 as its sample. Through empirical analysis based on full-text annual reports, it examines the impact of ESG rating discrepancies on annual report tone management. Furthermore, it employs mediation and heterogeneity analyses to uncover the specific pathways through which ESG rating discrepancies influence annual report tone management. The potential research contributions of this paper are as follows: First, existing research on the economic consequences of ESG rating discrepancies primarily focuses on corporate financial aspects. This study, by examining the impact of ESG rating discrepancies on non-financial disclosure behaviour through the lens of annual report textual tone management, enriches the literature on the economic implications of such discrepancies. Second, it combines ESG rating discrepancies with managerial tone in annual report texts to further explore the mediating role of corporate reputation and investor sentiment. This offers a fresh perspective on management disclosure strategies, providing novel insights for research on annual report textual tone. Thirdly, by conducting group tests based on heterogeneous characteristics such as internal control quality and information transparency, this study examines the differentiated effects of ESG rating discrepancies on annual report tone management. This provides more precise decision-making references for investors, regulators, and enterprises themselves, thereby promoting the healthy development of capital markets.

2. Theoretical Analysis and Research Hypotheses

With the deepening of global sustainability concepts and the intensification of regulatory requirements for non-financial disclosure, ESG ratings have evolved from a supplementary "icing on the cake" to a key indicator measuring corporate core competitiveness and long-term sustainability. In recent years, the diversification of ESG rating agencies has led to significant inconsistencies in ratings assigned to the same company by different agencies (CHRISTENSEN et al, 2022)[4]. Differences in indicator weightings across rating systems, inconsistent data collection standards, and biases in evaluation dimensions lead to substantial discrepancies in ESG ratings for the same entity. This creates cognitive confusion among information recipients in capital markets (Berg et al., 2022)[1].

On one hand, based on information asymmetry theory, inherent disparities exist in the knowledge distribution regarding a company's true value and potential risks between internal managers and external stakeholders. ESG rating discrepancies reflect differing assessments of non-financial performance across institutions, generating information confusion and widening the information gap. This hinders the market's ability to form clear judgements on a company's sustainable development capacity and long-term risk levels. To mitigate scepticism, management tends to employ unusually positive language in annual reports to signal compliance while concealing actual ESG performance. Signalling theory further supports this logic. When facing heightened information noise, firms have an incentive to release new signals to counteract negative perceptions. The tone of annual report text serves as a low-cost, effective signalling tool; amplifying its positivity alleviates market concerns.

Conversely, discrepancies in ESG ratings may provide management with opportunistic incentives to mislead stakeholders by adjusting annual report tone, thereby maximising personal gains. Under agency theory, managers' individual interests align with short-term market performance and shareholder evaluations. ESG rating divergences can trigger share price volatility[5], increased financing costs[6][7], and other factors threatening managerial remuneration. Under pressure, management tends to adopt low-cost, quick-impact textual manipulation strategies to project an overly favourable corporate image, diverting attention from potential issues and alleviating professional stress. Such conduct undermines stakeholders' right to information and may compromise capital market fairness and transparency.

Based on the foregoing analysis, this paper proposes the following research Hypothesis1:

ESG rating discrepancies prompt management to engage in annual report textual tone management.

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3. Research Design

3.1 Data Sources and Sample Selection

As Chinese rating agency Syntao Green Finance pioneered the release of ESG rating data in 2015, this study commences its sample period from that year to ensure comparability of corporate data across years, mitigate potential distortions in findings from policy shifts or other events, and account for the volume and completeness of required database information. This study utilises data from Shanghai and Shenzhen A-share listed companies spanning 2015 to 2024, drawing upon ESG data from six major institutions: Huazheng ESG Rating, Wind, FTSE Russell, Syntao Green Finance, Susallwave FIN-ESG, and Bloomberg. The data underwent the following processing: ① Exclusion of listed companies in the financial sector; ② Exclusion of ST, *ST, and PT companies; ③ Exclusion of samples with missing relevant data. Following screening, the study ultimately obtained 8,880 company-year sample observations. The ESG ratings from Huazheng ESG Rating, Wind, FTSE Russell, Syntao Green Finance and Susallwave FIN-ESG are sourced from Wind Database, while Bloomberg's ESG ratings are derived from its Terminal Data Platform. Annual report tone data were derived from the China Research Data Service Platform (CNRDS). Remaining company financial and governance data were sourced from the Chinese Securities Market and Accounting Research (CSMAR) database. To mitigate the impact of outliers, all continuous variables underwent Winsorisation at the 1% and 99% levels.

3.2 Variable Definitions

3.2.1 Dependent Variables

Annual Report Tone Management Level: Firstly, following the methodology of Zeng Qingsheng et al. (2018)[8], the Financial Sentiment Lexicon (LM Lexicon) was employed to calculate the net optimistic tone of annual report texts based on their full content. The specific calculation methods are as follows: ① LMTONE1: (Positive Vocabulary Count - Negative Vocabulary Count) / Annual Report Vocabulary Count; ② LMTONE2: (Positive Vocabulary Count - Negative Vocabulary Count) / (Positive Vocabulary Count + Negative Vocabulary Count). Higher values for LMTONE1 and LMTONE2 indicate a more positive tone in the annual report.

Secondly, drawing upon the research of Lin Wanfa et al. (2018)[9] and Ma Yongqiang et al. (2024)[10], we isolate anomalous positive tone (ABTONE1/ABTONE2) by calculating the residual term of model (1).

$$LMTONE_{i,t} = \beta_0+\beta_1 ROA_{i,t}+\beta_2 RET_{i,t}+\beta_3 SIZE_{i,t}+\beta_4\ BTM_{i,t}+\beta_5\ ROA\_SD_{i,t}+\beta_6\ RET\_SD_{i,t+}\beta_7\ AGE_{i,t+}\beta_8\ LOSS_{i,t}+\beta_9\ D\_ROA_{i,t}+\varepsilon_{i,t} \quad (1)$$

In Model (1), LMTONE1 and LMTONE2 denote the net optimistic tone of annual report texts; ROA represents the company's return on assets; RET denotes the 12-month hold-to-maturity yield; SIZE denotes the natural logarithm of total corporate assets; BTM denotes the book-to-market ratio; RET_SD denotes the standard deviation of monthly stock returns; ROA_SD denotes the standard deviation of performance over the preceding five years; AGE denotes the natural logarithm of the firm's listing duration; LOSS is a dummy variable valued at 1 for annual losses and 0 otherwise; D_ROA represents the difference between net profit in period t and period t-1. The residuals obtained from Model (1) regression constitute the annual report tone anomaly values ABTONE1 and ABTONE2, which measure the extent of annual report tone management. Drawing upon prior research experience and considering dimensionality, to prevent regression coefficients from becoming excessively small and difficult to report, both explained variables ABTONE1 and ABTONE2 are multiplied by 100. This reduces the number of decimal places in regression coefficients, facilitating the presentation of results.

3.2.2 Explanatory Variables

ESG Rating Discrepancy: Drawing upon the research of AVRAMOV (2022)[11] and Zhou Zejang et al. (2023)[12], First, we standardise the measurement scale. ESG rating data from Huazheng ESG Rating, Wind, Syntao Green Finance and Susallwave FIN-ESG are assigned values between 0 and 9. For instance, Syntao Green Finance employs ten tiers: "D, C-, C, C+, B-, B, B+, A-, A, A+". These are sequentially mapped to values 0 through 9. FTSE Russell and Bloomberg data are numerical types, with scoring ranges of 0–5 and 0–100 respectively. Therefore, FTSE Russell ESG ratings are multiplied by 9/5, while Bloomberg ESG scores are multiplied by 9/100.

Secondly, the ESG rating data undergoes standardisation. To maximise the utilisation of ESG rating

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data, each company is required to have ratings from at least two agencies annually. For each rating agency, the numerical ESG scores of all rated companies are sorted annually. The data undergoes percentile-based processing followed by normalisation: the sorted data is grouped into percentiles, then simultaneously divided by 100 to normalise it, ensuring all values fall within the [0,1] range. Finally, the standard deviation is calculated for any two ESG ratings of the same company within the same year, forming an "ESG rating pair". The mean of all such pairs constitutes the company's ESG rating divergence, denoted as ESG_uncertainty.

3.2.3 Control Variables

To control for other factors potentially influencing the positive tone in annual reports, this study adopts the following control variables, drawing upon research by Wang Huajie et al. (2018)[13] and Ma Yongqiang et al. (2024)[10]: Enterprise scale (ASSETSIZE), growth potential (GROWTH), debt-to-asset ratio (LEV), duration since listing (AGE), dual role of chairman and CEO (DUAL), shareholding concentration (SHARE1), management shareholding ratio (MNGMHLDN), whether auditor is from the Big Four (BIG4), book-to-market ratio (BTM), and proportion of independent directors (INDEP). Detailed variable definitions and explanations are provided in Table 1: Variable Definitions.

Table 1: Variable Definitions

Variable Type	Variable Name	Variable Symbol	Variable Definition
Dependent Variable	Annual Report Tone Management Level 1	ABTONE1	Calculated via Model (1) based on the net optimistic tone LMTONE1 derived from annual report text
	Annual Report Tone Management Level 2	ABTONE2	Based on the net optimistic tone of annual report text LMTONE2, calculated using Model (1)
Explanatory Variables	ESG rating divergence	ESG_uncertainty	Calculated as the mean of all "ESG rating pairs" based on data from six ESG rating agencies
Control Variables	Company size	ASSETSIZE	ln(Total Assets at Year-End)
	Growth potential	GROWTH	Main Business Revenue Growth Rate
	Asset-liability ratio	LEV	Total Liabilities at Year-End / Total Assets
	Years since company listing	AGE	ln(Current Year - Year of Listing + 1)
	Dual Role	DUAL	Whether the Chairman and General Manager are the same person: 1 if yes, 0 if no
	Shareholding Concentration	SHARE1	Shareholding ratio of the company's largest shareholder
	Management Shareholding Ratio	MNGMHLDN	Proportion of shares held by directors, supervisors and senior management relative to total share capital
	Whether the auditor is from the "Big Four"	BIG4	Whether the auditor is from one of the Big Four accounting firms: 1 if yes, 0 if no
	Book-to-market ratio	BTM	Total Assets / Market Value
	Proportion of Independent Directors	INDEP	Number of Independent Directors / Number of Board Members
	Industry	INDU	Control Industry Effect
	Year	YEAR	Controlling Time Effects

3.3 Model Design

To examine whether ESG rating discrepancies prompt management to engage in annual report textual tone management, the following model is constructed:

$$ABTONE_{i,t+1}=\beta_0+\beta_1 ESG\_uncertainty_{i,t}+\beta_2 \Sigma\ Controls_{i,t}+\Sigma\ INDU+\Sigma\ YEAR+\varepsilon_{i,t} \quad (2)$$

Where the dependent variables ABTONE1 and ABTONE2 represent the tone management levels in annual reports, ESG_uncertainty denotes ESG rating divergence, Controls represent control variables, β are the estimated coefficients of the regression equation, ε is the random disturbance term, i denotes

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the firm, t denotes time, and INDU and YEAR represent industry and year fixed effects respectively. As ESG rating agencies typically release data at year-end, the explained variable 'annual report tone management' is treated as one period ahead in the regression. If $\beta_1 > 0$, then H1 holds: ESG rating divergence prompts management to engage in annual report textual tone management.

4. Empirical Findings and Analysis

4.1 Descriptive Statistics

Table 2 presents descriptive statistics for the study's key variables. The standard deviations for the two ABTONE measures are 0.871 and 6.315 respectively, indicating substantial variation in annual report tone management across sample firms. These figures are comparable to those reported by Lin et al. (2022)[9] and Ma Yongqiang (2024)[10]. The core explanatory variable ESG_uncertainty exhibits a minimum value of 0.02, a maximum of 0.488, and a mean of 0.178. This indicates substantial divergence in ESG rating outcomes among sample firms, aligning with findings from Zhou Zejang et al. (2023)[12]. Compared to prior research, the overall distribution of other control variables remains within expected reasonable bounds.

Table 2: Descriptive Statistics for Key Variables

Variable	N	Mean	Standard Deviation	Minimum	25th percentile	Median	75th percentile	Maximum
ABTONE1	8880	0.0530	0.871	-2.116	-0.520	0.0640	0.635	2.145
ABTONE2	8880	0.356	6.315	-15.43	-3.830	0.430	4.572	15.64
ESG_uncertainty	8880	0.178	0.102	0.0200	0.0880	0.180	0.240	0.488
ASSETSIZE	8880	23.05	1.277	20.76	22.12	22.85	23.76	26.92
GROWTH	8880	0.145	0.283	-0.413	-0.007	0.104	0.241	1.511
LEV	8880	0.436	0.179	0.0830	0.297	0.435	0.572	0.824
AGE	8880	2.456	0.514	1.609	2.079	2.485	2.890	3.401
DUAL	8880	0.283	0.450	0	0	0	1	1
SHARE1	8880	33.47	14.70	8.190	21.94	31.27	43.03	74.18
MNGMHLDN	8880	12.00	16.86	0	0.0130	1.363	21.70	62.91
BIG4	8880	0.0970	0.296	0	0	0	0	1
BTM	8880	0.641	0.271	0.129	0.428	0.629	0.845	1.232
INDEP	8880	37.70	5.560	14.29	33.33	36.36	42.86	80

4.2 Analysis of Benchmark Regression Results

Table 3 presents the regression results for Model (2). Columns (1) to (2) do not control for fixed effects, while columns (3) to (4) control for year and industry fixed effects. Results indicate that the regression coefficients for the core explanatory variable ESG_uncertainty in columns (1) to (4) are all significantly positive at the 1% level. This demonstrates that ESG rating divergence prompts management to engage in annual report textual tone management, thereby validating Hypothesis1.The primary reason likely lies in ESG rating discrepancies failing to accurately reflect corporate ESG performance, thereby failing to convey effective incremental information to the market. Confronted with divergent ESG ratings, investors question the accuracy and reliability of such ratings, subsequently influencing their investment decisions. Upon recognising the negative impact of this information asymmetry, management adjusts the textual tone of annual reports to convey unusually positive signals, aiming to stabilise investor confidence, uphold corporate image, and mitigate share price volatility.

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Table 3: Regression Results for ESG Rating Discrepancies and Annual Report Tone Management

Variables	(1)	(2)	(3)	(4)
	ABTONE1	ABTONE2	ABTONE1	ABTONE2
ESG_uncertainty	0.374***	2.652***	0.248***	1.745***
	(0.086)	(0.626)	(0.085)	(0.614)
ASSETSIZE	-0.110***	-0.799***	-0.103***	-0.752***
	(0.010)	(0.075)	(0.010)	(0.075)
GROWTH	0.124***	0.914***	0.082***	0.606***
	(0.032)	(0.231)	(0.032)	(0.231)
LEV	-0.366***	-2.764***	-0.307***	-2.315***
	(0.060)	(0.434)	(0.061)	(0.444)
AGE	0.307***	2.163***	0.324***	2.295***
	(0.022)	(0.157)	(0.021)	(0.154)
DUAL	0.059***	0.408***	0.054***	0.377***
	(0.020)	(0.149)	(0.020)	(0.145)
SHARE1	-0.011***	-0.081***	-0.010***	-0.071***
	(0.001)	(0.005)	(0.001)	(0.005)
MNGMHLDN	0.005***	0.038***	0.005***	0.036***
	(0.001)	(0.005)	(0.001)	(0.004)
BIG4	0.386***	2.903***	0.369***	2.787***
	(0.032)	(0.235)	(0.032)	(0.230)
BTM	0.079*	0.577*	0.223***	1.620***
	(0.041)	(0.295)	(0.043)	(0.310)
INDEP	0.009***	0.068***	0.009***	0.068***
	(0.002)	(0.012)	(0.002)	(0.011)
_CONS	1.784***	12.990***	1.849***	13.281***
	(0.216)	(1.570)	(0.239)	(1.732)
INDU	No	No	Yes	Yes
YEAR	No	No	Yes	Yes
N	8880	8880	8880	8880
Adjusted R^2	0.102	0.102	0.155	0.156

*** p<0.01, ** p<0.05, * p<0.1, values in parentheses denote t-statistics

4.3 Robustness and Endogeneity Tests

4.3.1 Substitution of Explanatory Variables

To further validate the robustness of ESG rating divergence's impact on annual report textual tone management, this study references research by He Taiming (2023)[14]. It replaces the measurement of ESG rating divergence by calculating the standard deviation (ESGdif6) of rating data from six ESG rating agencies—Huazheng ESG Rating, Wind, FTSE Russell, Syntao Green Finance, Susallwave FIN-ESG, and Bloomberg—after standardising their measurement scales. The regression results after replacing the explanatory variable measuring ESG rating divergence are presented in columns (1) and (2) of Table 4. Regardless of whether the annual report tone management measure employed was ABTONE1 or ABTONE2, ESGdif6 remained significantly positive at the 5% level, validating the robustness of this paper's primary findings.

4.3.2 Instrumental Variables Approach

Considering potential endogeneity between ESG rating divergence and annual report tone management, this study employs two-stage least squares (2SLS) to mitigate endogeneity effects. The mean of ESG rating divergence within the same year and province (ESG_uncertainty_2) is selected as the instrumental variable. Regression results are presented in column (3) of Table 4, the first-stage regression indicates that the coefficient for ESG_uncertainty_2 is significantly positive, confirming strong relevance between the chosen instrumental variable and the core explanatory variable. Furthermore, the weak instrumental variable test reveals a minimum eigenvalue statistic substantially exceeding the critical value, further validating the instrumental variable. The second-stage regression results in column (4) and (5) reveal that the regression coefficient for ESG_uncertainty is significantly positive and passes the test at the 1% significance level, consistent with the primary findings discussed earlier.

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Table 4: Robustness test results for the replacement explanatory variable and instrumental variable methods

Variable	Replacement Explanatory Variables		Instrumental Variables Method		
	(1)	(2)	(3)	(4)	(5)
	ABTONE1	ABTONE2	ESG_uncertainty	ABTONE1	ABTONE2
ESGdif6	0.045**	0.307**			
	(0.019)	(0.140)			
ESG_uncertainty				1.807***	12.496***
				(0.490)	(3.511)
ESG_uncertainty_2			0.981***		
			(0.055)		
CONTROLS	Yes	Yes	Yes	Yes	Yes
_CONS	-81.926***	-10.947***	-0.075***	1.693***	12.203***
	(17.591)	(2.446)	(0.028)	(0.266)	(1.937)
INDU	Yes	Yes	Yes	Yes	Yes
YEAR	Yes	Yes	Yes	Yes	Yes
N	8880	8880	8880	8880	8880
Adjusted R^2	0.154	0.155	0.053	0.122	0.126

*** p<0.01, ** p<0.05, * p<0.1, t-values in parentheses

4.3.3 Propensity Score Matching

The primary regression model may exhibit endogeneity issues stemming from omitted variables to some extent. Furthermore, the subjective nature of disclosure in annual report textual tone may introduce sample self-selection bias, potentially skewing research conclusions. To mitigate the impact of these issues on findings, this study employs Propensity Score Matching (PSM) to test Hypothesis1.Groups were formed based on whether ESG rating divergence exceeded the mean, thereby establishing an experimental group and a control group. Given the smaller sample size in the experimental group, a 1:3 nearest neighbour matching method was employed to minimise information loss from excessive matching failures. All original control variables were selected as covariates, yielding 8,079 observations after successful matching. Balance tests revealed standardised deviations below 5% for all matched covariates, indicating satisfactory matching quality.

The common support test results in Figure 1 reveal that only a negligible number of observations were lost during matching for both the treatment and control groups, with the vast majority of observations falling within the common range of values. The comparison of kernel density functions before and after matching (Figure 2) reveals that post-matching, the overlap between the experimental and control groups' kernel density functions is greater, the common support area is larger, fewer samples are lost, and the representativeness and reliability of the sample are enhanced. Based on this, the benchmark regression model was re-tested using the PSM-matched samples. The regression results, as shown in Table 5 (Columns 1–2), indicate that the positive correlation between ESG rating divergence and the degree of tone management in annual reports remains significant. This demonstrates that, after mitigating potential endogeneity issues, the research conclusions remain consistent with the preceding analysis, indicating that the findings possess relative robustness.

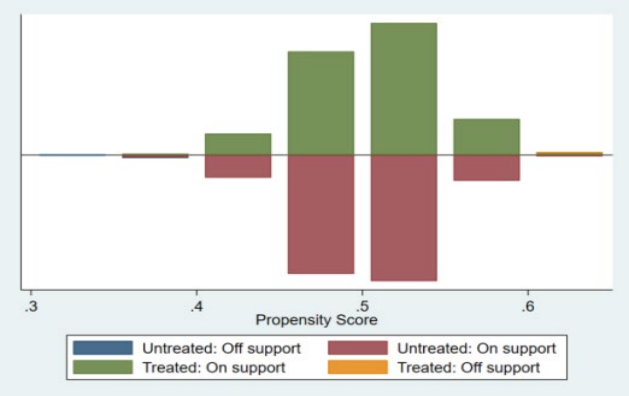

Figure 1: Results of the co-support test

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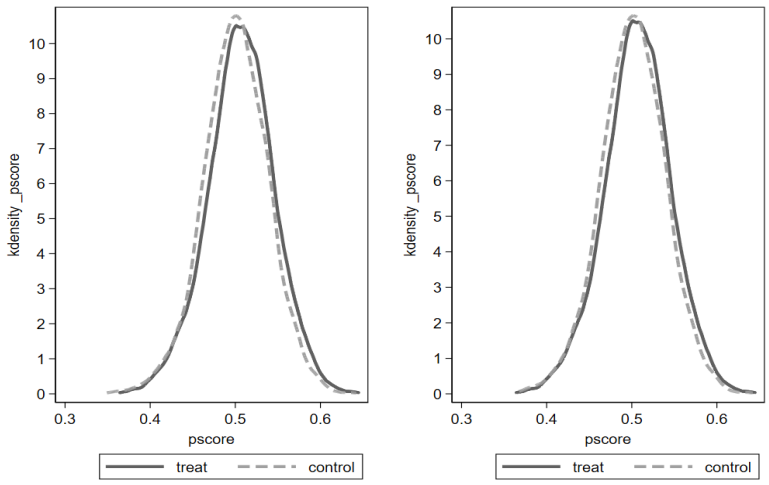

Figure 2: Comparison of Kernel Density Functions Before and After Matching

4.3.4 Heckman Two-Stage

To mitigate the issue of sample self-selection bias, this paper additionally employs Heckman two-stage regression to test Hypothesis1. First, in the initial stage, a new ESG rating divergence dummy variable TREAT_ESG_uncertainty is defined, taking a value of 1 when ESG rating divergence exceeds the median, and 0 otherwise. Using TREAT_ESG_uncertainty as the endogenous variable and the average ESG rating divergence (ESG_uncertainty_) of other firms in the same industry during the same year as the exogenous instrumental variable, a Probit regression is conducted to calculate the inverse Mills ratio (IMR). Subsequently, in the second stage, the IMR calculated in the first stage is incorporated as a control variable into model (1) for regression. The test results, as shown in columns (3) to (5) of Table 5, indicate that the regression coefficient for ESG rating divergence (ESG_uncertainty) remains significantly positive at the 1% level, thereby reaffirming Hypothesis 1.

Table 5: presents robustness test results using propensity score matching (PSM) and the Heckman two-stage method

Variable	PSM		Heckman two-stage		
	(1)	(2)	(3)	(4)	(5)
	ABTONE1	ABTONE2	TREAT_ESG_uncertainty	ABTONE1	ABTONE2
ESG_uncertainty	0.262***	1.817***		0.248***	1.741***
	(0.089)	(0.642)		(0.085)	(0.614)
ESG_uncertainty_			-2.988***		
			(1.008)		
IMR				-0.114	-0.733
				(0.307)	(2.225)
CONTROLS	Yes	Yes	Yes	Yes	Yes
_CONS	1.926***	13.867***	-1.042**	2.053***	14.589***
	(0.251)	(1.818)	(0.407)	(0.598)	(4.334)
INDU	Yes	Yes	Yes	Yes	Yes
YEAR	Yes	Yes	Yes	Yes	Yes
N	8079	8079	8875	8875	8875
Adjusted R^2	0.153	0.154		0.155	0.156

*** p<0.01, ** p<0.05, * p<0.1, t-values in parentheses

5. Further Analysis

5.1 Mechanism Analysis

The empirical analysis above yields a crucial conclusion: ESG rating discrepancies prompt management to engage in annual report tone management. This paper delves into the underlying mechanism, constructing the following model to test the mediating role of corporate reputation and investor sentiment, drawing upon Wen et al. (2014) [15]:

$$Med_{i,t}= \alpha_0+ \alpha_1 ESG\_uncertainty_{i,t}+ \alpha_2 \Sigma Controls_{i,t}+\Sigma INDU +\Sigma YEAR + \varepsilon_{1i,t} \quad (3)$$

$$ABTONE_{i,t+1}=\beta_0+\beta_1 ESG\_uncertainty_{i,t}+\beta_2 Med_{i,t}+\beta_3 \Sigma Controls_{i,t}+\Sigma INDU+\Sigma YEAR+\varepsilon_{2i,t} \quad (4)$$

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Where Med denotes the mediating variables, namely corporate reputation and investor sentiment, with other variables interpreted as in Model (2).

5.1.1 Corporate Reputation

A favourable corporate reputation constitutes a valuable intangible asset for a company. When discrepancies in an enterprise's ESG ratings intensify, market perceptions and evaluations of the firm may fluctuate, thereby impacting its reputation. To maintain or enhance the corporate image, management may engage in unusually positive management of the tone in annual report texts. For measuring corporate reputation (REPUTATION), drawing upon the research of Guan Kailei et al. (2019)[16], we selected twelve indicators for factor analysis: corporate assets, revenue, net profit, and value rankings within the industry; debt-to-asset ratio; long-term debt ratio; current ratio; dividend per share; earnings per share; whether audited by one of the Big Four international accounting firms; proportion of independent directors; and sustainable growth rate. This yielded a corporate reputation score, which was then divided into ten groups from lowest to highest, with each group assigned a REPUTATION value from 1 to 10.

Column (1) of Table 6 indicates that the regression coefficient for ESG_uncertainty with REPUTATION is significantly negative, demonstrating that ESG rating divergence exerts a pronounced negative impact on corporate reputation. This arises because inconsistent ESG ratings convey uncertain signals to the market regarding a firm's sustainability performance, thereby diminishing stakeholder trust and goodwill towards the organisation. Furthermore, columns (2) and (3) incorporate both ESG_uncertainty and REPUTATION into the regression model. The results indicate that regardless of whether annual tone management is measured using ABTONE1 or ABTONE2, ESG_uncertainty is significantly positive at the 5% level, while REPUTATION is significantly negative at the 1% level. This indicates that corporate reputation partially mediates the relationship between ESG rating discrepancies and annual report tone management.

5.1.2 Investor Sentiment

As a critical factor influencing capital markets, fluctuations in investor sentiment directly impact managerial decision-making. When ESG rating discrepancies trigger market scepticism regarding a firm's sustainability capabilities, the accumulation of negative investor sentiment may generate capital constraint pressures, compelling management to employ annual report tone management to convey positive signals. To measure investor sentiment (SENT), drawing upon Jin Guanghui (2015)[17], we first employed orthogonalisation to eliminate the influence of fundamental factors. This involved using proxy variables reflecting company fundamentals—such as revenue growth rate and return on equity—and cross-correlating them with four investor sentiment sub-dimensions: book-to-market ratio and stock return momentum. Secondly, residuals from regressions of Tobin's Q, stock return momentum and other variables against fundamental factors were subjected to principal component analysis. The composite investor sentiment index (SENT) was constructed from principal components explaining 85% of the variance. Higher index values indicate greater investor optimism, while lower values reflect greater pessimism.

Column (4) of Table 6 indicates that the regression coefficient between ESG_uncertainty and SENT is significantly negative, demonstrating that ESG rating divergence exerts a pronounced negative impact on investor sentiment. This aligns with the preceding theoretical analysis, wherein inconsistent ESG ratings heighten market uncertainty regarding corporate future performance, thereby dampening investor sentiment. Furthermore, regression results in columns (5) and (6) reveal that ESG_uncertainty is significantly positive at the 5% level, while SENT is significantly negative at the 1% level. This indicates that investor sentiment partially mediates the relationship between ESG rating divergence and annual report tone management.

Table 6: Testing the Mechanism

Variable	(1)	(2)	(3)	(4)	(5)	(6)
	REPUTATION	ABTONE1	ABTONE2	SENT	ABTONE1	ABTONE2
ESG_uncertainty	-0.349**	0.233**	1.623**	-0.069**	0.242***	1.702***
	(0.155)	(0.092)	(0.669)	(0.034)	(0.085)	(0.614)
REPUTATION		-0.059***	-0.424***			
		(0.007)	(0.049)			
SENT					-0.069***	-0.492***
					(0.026)	(0.190)
CONTROLS	Yes	Yes	Yes	Yes	Yes	Yes
_CONS	_cons	-30.949***	-0.037	-0.278	-1.838***	1.725***
		(0.427)	(0.329)	(2.384)	(0.097)	(0.244)

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INDU	Yes	Yes	Yes	Yes	Yes	Yes
YEAR	Yes	Yes	Yes	Yes	Yes	Yes
N	7913	7913	7913	8871	8871	8871
Adjusted R^2	0.650	0.159	0.160	0.595	0.155	0.156

*** p<0.01, ** p<0.05, * p<0.1, values in parentheses denote t-values

5.2 Heterogeneity Test

5.2.1 Internal Control Quality

To investigate the heterogeneous effects of internal control quality, this study adopts the Shenzhen Dibo Internal Control Index to measure corporate internal control quality, following the research of Quan Xiaofeng et al. (2015)[18]. Based on the sample mean, the sample companies were categorised into high and low internal control quality groups, with subsequent regression analysis conducted for each group. The regression results are presented in Table 7. Within the high internal control quality group, the regression coefficient for ESG_uncertainty is not significant. Conversely, in the low internal control quality group, the regression coefficient for ESG_uncertainty is significantly positive at the 1% level. A plausible explanation lies in the fact that high-quality internal control systems effectively regulate management decision-making and enhance firms' capacity to address external risks. Consequently, the influence of external signals such as ESG rating discrepancies on the tone management of annual reports is mitigated. Enterprises with low internal control quality exhibit deficiencies in information disclosure and risk management. When confronted with negative market signals such as ESG rating discrepancies, management lacks effective internal constraints and is more likely to adopt an unusually positive tone in annual reports to preserve corporate image and stabilise investor sentiment.

Table 7: Heterogeneity Test Based on Internal Control Quality

Variable	High Internal Control Quality Group		Low Internal Control Quality Group	
	(1)	(2)	(3)	(4)
	ABTONE1	ABTONE2	ABTONE1	ABTONE2
ESG_uncertainty	0.099	0.665	0.447***	3.193***
	(0.115)	(0.835)	(0.126)	(0.906)
CONTROLS	Yes	Yes	Yes	Yes
_CONS	1.820***	13.080***	2.124***	15.347***
	(0.308)	(2.241)	(0.406)	(2.918)
INDU	Yes	Yes	Yes	Yes
YEAR	Yes	Yes	Yes	Yes
N	5047	5047	3833	3833
Adjusted R^2	0.166	0.167	0.144	0.145

*** p<0.01, ** p<0.05, * p<0.1, t-values in parentheses

5.2.2 Information Transparency

External investors obtain corporate information through listed companies' disclosures, meaning information transparency hinges on the quality of disclosed data. Does this transparency influence the relationship between ESG rating discrepancies and annual report tone management? Following the methodology of Huang et al. (2019)[19], this study measures information transparency using the number of analysts covering a listed company. Firms are grouped based on the average number of analysts: those with coverage equal to or above the average are classified as high transparency, while others are low transparency. The regression results are presented in Table 8, which indicate that within the high information transparency group, the regression coefficient for ESG_uncertainty is not significant. Conversely, within the low information transparency group, the regression coefficient for ESG_uncertainty is significantly positive at the 1% level. This may stem from the fact that companies with high information transparency typically possess more robust disclosure systems and higher market credibility, rendering their annual report textual tone less susceptible to external rating discrepancies. Conversely, firms with low information transparency, grappling with more pronounced information asymmetry, may see management adopt an unusually positive textual tone when confronting ESG rating divergences. This approach aims to compensate for disclosure shortcomings, thereby stabilising investor expectations and market confidence.

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Table 8: Heterogeneity Test Based on Information Transparency

Variable	High Information Transparency Group		Low Information Transparency Group	
	(1)	(2)	(3)	(4)
	ABTONE1	ABTONE2	ABTONE1	ABTONE2
ESG_uncertainty	0.101	0.544	0.337***	2.449***
	(0.158)	(1.160)	(0.100)	(0.719)
CONTROLS	Yes	Yes	Yes	Yes
_CONS	1.334***	9.921***	2.538***	18.093***
	(0.425)	(3.113)	(0.352)	(2.533)
INDU	Yes	Yes	Yes	Yes
YEAR	Yes	Yes	Yes	Yes
N	3124	3124	5756	5756
Adjusted R^2	0.185	0.187	0.153	0.153

*** p<0.01, ** p<0.05, * p<0.1, with t-values indicated in parentheses

6. Conclusions and Policy Recommendations

This study examines the impact of ESG rating divergence on annual report tone management among non-financial listed companies on Shanghai and Shenzhen A-share markets in China from 2015 to 2024. Findings reveal: (1) a significant positive correlation exists between ESG rating divergence and annual report tone management; (2) corporate reputation and investor sentiment partially mediate this relationship; (3) The intensifying effect of ESG rating divergence on annual report textual tone management is more pronounced in firms with poorer internal control quality and lower information transparency. Regression results remain robust following endogeneity and robustness tests. These findings enrich the literature on factors influencing annual report tone management, offering implications for corporate governance and information disclosure with theoretical and practical value.

In light of these findings, the following policy recommendations are proposed:

Firstly, regulatory authorities should focus on establishing a refined regulatory framework. It is recommended to expedite the development of unified and comparable ESG disclosure standards, clarifying quantitative requirements for key indicators to reduce the scope for rating discrepancies at source. Concurrently, oversight of annual report disclosures by listed companies should be strengthened, incorporating abnormal fluctuations in report tone into risk monitoring systems. Particular attention should be paid to non-state-owned enterprises exhibiting significant ESG rating discrepancies and weak internal controls, implementing targeted regulation. Furthermore, market intermediaries such as ESG rating agencies require enhanced regulatory guidance. They should be mandated to refine methodologies and proactively disclose relevant information to enhance transparency, thereby fostering a healthy and orderly ESG ecosystem and effectively mitigating greenwashing risks.

Secondly, listed companies should transition from reactive compliance to proactive governance. Management must recognise that, against the backdrop of advancing dual carbon goals and intensifying regulation, relying on cosmetic reporting will not establish sustainable competitive advantage. Enterprises should allocate greater resources to enhancing substantive ESG performance, strengthening internal controls and improving information transparency to solidify their developmental foundations. It is recommended to establish long-term ESG governance mechanisms, integrating ESG factors into strategic decision-making and operational processes. Regular disclosure of verifiable ESG performance data should address stakeholder concerns through substantive actions, achieving a fundamental shift from "sounding good" to "delivering solid results".

Finally, investors must enhance their ability to discern information. Aligning ESG rating discrepancies with the tone of annual reports should serve as a key risk assessment indicator. When significant ESG rating divergences coincide with unusually positive textual language, investors should exercise caution, as this may signal attempts to mask inadequate ESG practices through rhetorical embellishment. Institutional investors should leverage their professional expertise to deepen ESG fundamental research and drive improvements in ESG practices among investee companies through governance engagement and the exercise of voting rights. Individual investors, meanwhile, should strengthen their ESG investment knowledge, focus on companies' long-term value creation capabilities, and avoid being misled by overly positive textual language by comparing hard metrics such as ESG commitments versus actual investments and rating changes. Collectively, these efforts will enhance the efficiency of resource allocation within capital markets.

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