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ESG RATING DISAGREEMENT AND STOCK MISPRICING

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Abstract. Identifying the causes of stock mispricing is crucial for stabilizing capital markets. Utilizing panel data from Chinese A-share listed firms, this paper investigates the causal association between ESG rating disagreement and stock mispricing. We reveal that ESG rating disagreement significantly exacerbates stock mispricing. Further analysis shows that cross-shareholding investors, media attention and marketization weaken the relationship between ESG rating disagreement and stock mispricing. We also demonstrate that the influence of ESG rating disagreement on stock mispricing is more pronounced in state-owned enterprises, heavy pollution enterprises and enterprises with short-term institutional investor holdings. These findings help to provide some insights into ESG rating disagreement as a determinant influencing stock mispricing among emerging markets.

Keywords: ESG, ESG rating disagreement, stock mispricing, cross-shareholding investors, media attention, marketization.

JEL Classification: G10, G30, O16.

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1. Introduction

In Chinese capital markets, which exhibit characteristics of both emerging and transitional, persistent imperfect competition and pronounced information asymmetry may cause stock prices to deviate from their intrinsic value, thereby triggering stock mispricing. In recent years, non-financial information has played an increasingly indispensable role in pricing. In particular, for the vast number of small and medium-sized retail investors in Chinese capital markets, non-financial information is crucial for identifying and understanding corporate social responsibility practices and gaining genuine insight into its development prospects (Wang & Liu, 2024).

Concurrently, Chinese enterprises are undergoing a vigorous digital transformation. The penetration of forward-looking digital technologies such as big data, artificial intelligence and blockchain not only fosters corporate productivity and reshapes operational and management models, but also substantially unlocks their sustainable potential (Peng & Tao, 2022). Against this backdrop, non-financial information concerning corporate future development and sustainable performance has become increasingly abundant. Notably, ESG has emerged as a comprehensive measure of corporate sustainable practices (Amel-Zadeh & Serafeim, 2018). According to statistics from China Securities Index, by September 2025, 2,521 A-share

listed firms had published ESG-related reports for the 2024 financial year, representing 46.83%[1]. And the rise of ESG investment principles has also spurred an increasingly active ratings market (Hao et al., 2025). The ESG ratings issued by various agencies assist in disseminating ESG information among capital markets, thereby offering a pivotal basis for investor decision-making.

However, due to heterogeneity among rating agencies in the scope of ESG assessment, measurement methodologies, and weighting assignments (Berg et al., 2022), differences in proprietary information, evaluation models, and standard systems bring about significant ESG rating disagreement of certain listed firms. ESG rating disagreement undermines the reliability of ESG ratings, while the resulting noise in capital markets inevitably influences investors' adaptive behavior. And this includes investors' decisions regarding valuation, namely stock pricing. Existing studies have examined the external market antecedents of stock mispricing from the perspectives of policy frameworks (Beckers & Bernoth, 2024) and market volatility (Noussair et al., 2016). But these researches might fall short of discerning the intricate association between ESG rating disagreement and stock mispricing.

Indeed, given the professional nature of ESG and the characteristics of ESG information, which is difficult to accurately quantify and compare horizontally, most investors rely more on professional rating agencies to evaluate corporate ESG performance. ESG rating disagreement could to a large extent affect the quality of information received by investors, making it challenging for them to accurately perceive the real picture of ESG achievements or risks. It is thoroughly triggered contemplation whether ESG rating disagreement may generate information noise, obscure and conceal genuine ESG performance, induce divergent investor judgments, provoke decision-making interference, and ultimately distort stock pricing.

Simultaneously, the quality of the information transmission and communication environment within and outside the enterprise directly and closely impacts investors' ability to obtain and process information, and is contextually important to whether investors could rationally evaluate ESG-related idiosyncratic information and make subsequent decisions regarding stock valuation. Firstly, cross-shareholding investors leverage their own extensive governance experience and networked information advantages to bridge the information gap between enterprises and investors (Park et al., 2019). This facilitates the expansion of ESG privacy information, thereby mitigating cognitive biases among investors stemming from ESG rating disagreement. Secondly, through information dissemination and sharing, the media could report on corporate ESG-related events in real time (Kölbel et al., 2017). As an informal institution, the media also performs an external oversight function (Dyck et al., 2008), capable of scrutinizing ESG practices. These are conducive to enhancing corporate ESG information transparency and deepening investors' understanding of genuine ESG performance. Finally, the advancement of marketization signifies more robust information infrastructure and communication environments (Li et al., 2020), which largely mitigates the disruptive impact of ESG rating disagreement on investors' decision-making. However, previous research has generally overlooked the above contextual roles in influencing the association between ESG disagreement and stock mispricing.

In view of this, we examine the relationship between ESG rating disagreement and stock mispricing in the Chinese stock market, while demonstrating how cross-shareholding

[1] On 18 September 2025, China Securities Index released the report titled "2024 Annual Series on ESG Information Disclosure for Listed Firms: Overall Disclosure Situation", presenting this data. The specific URL is https://oss-ch.csindex.com.cn/static/html/csindex/public/uploads/researches/files/zh_CN/20250918160554-2024%E5%B9%B4%E5%BA%A6%E4%B8%8A%E5%B8%82%E5%85%AC%E5%8F%B8ESG%E4%BF%A1%E6%8A%AB%E7%B3%BB%E5%88%97%E2%80%94%E2%80%94%E6%95%B4%E4%BD%93%E6%8A%AB%E9%9C%B2%E6%83%85%E5%86%B5.pdf

investors, media attention and marketization act as critical moderators shaping this connection. Our findings reveal that ESG rating disagreement exacerbates stock mispricing. Further analysis shows that cross-shareholding investors, media attention and marketization weaken this relationship. We also document that the influence of ESG rating disagreement on stock mispricing is more pronounced in firms with state-owned, heavy pollution and short-term institutional investor holdings.

The possible marginal contributions are as follows.

Firstly, corporate operational and managerial activities largely generate historical data, which constitutes financial information. However, when it comes to forecasting future risks and returns, non-financial information, such as ESG performance, proves more effective in forecasting development prospects and future performance. To a certain extent, ESG is gradually becoming a vital and focal factor influencing investor decision-making (Fatemi et al., 2018). Building upon existing research that predominantly focuses on financial information or single ESG rating result, this study places greater emphasis on the inconsistencies within a firm's non-financial information, namely, ESG rating disagreement. We explore the impact of this heterogeneous information on investor decision-making and valuation judgments, thereby enriching the relevant research concerning the economic consequences of ESG rating disagreement. Secondly, prior studies on the relationship between ESG and stock mispricing have extensively centered on ESG rating information provided by a specific agency (Wang et al., 2024), largely overlooking the impact of ESG rating disagreement. Indeed, in the absence of well-developed ESG standards and stable regulatory frameworks, investors generally face divergent rating results, which inevitably induce information decision-making confusion for those prioritizing ESG. This heterogeneous information is highly likely to present investors with mixed signals and noise, leading to valuation distortions. Consequently, we introduce ESG rating disagreement into the research field of stock pricing, offering a fresh perspective on understanding the antecedents of stock mispricing. Finally, our findings also provide empirical evidence for regulators to establish a unified ESG rating standard system and further shape the ESG information disclosure transparency within Chinese capital markets. We also offer influential and novel insights and references for facilitating the reversion of share prices to their intrinsic value.

The remainder of the study is structured as follows. Sections 2 and 3 include the literature review and hypothesis development. Sections 4 and 5 elaborate the methods and results respectively. The discussion and conclusions are presented in Sections 6 and 7 respectively.

2. Literature review

Due to variations in foundational data and proprietary information, differences in ESG comprehension and focus, along with the absence of comparable evaluation standards, the flexibility of non-unified systems induces divergent ESG rating results across agencies (Chatterji et al., 2016), giving rise to the concept of ESG rating disagreement. Significant disagreement in ESG ratings greatly undermines the credibility of effective ESG information. The mixed signals that such dynamics generate heighten the challenge for investors in gathering, identifying and interpreting incremental information (Lou et al., 2025). The resulting decline in information efficiency severely hinders investors' ability to make rational valuations and also has a negative impact on corporate risk management and future earnings (Avramov et al., 2022). More specifically, consensus-based ESG ratings facilitate the effective assessment of corporate sustainability performance, yet ESG rating disagreement significantly deteriorates the market information environment, thereby un-

dermining the predictive capability of ratings regarding future market developments (Serafeim & Yoon, 2023). In particular, ESG rating disagreement makes it difficult for small and medium-sized retail investors to determine whether a low rating result from poor ESG performance due to the enterprise's own operations, or from differences in the rating agencies' bounded rationality perspectives or measurement methodologies (Gibson Brandon et al., 2021). Concurrently, inconsistent ESG rating results lead to conflicting perceptions of ESG performance among investors, thereby causing decision-making interference.

Stock mispricing refers to the phenomenon where certain stock prices deviate from their intrinsic or fair value. Belief biases typically amplify divergences in investors' expectations regarding identical stocks, plunging share prices into a state of chaos and exacerbating mispricing (Feng et al., 2017). Concurrently, under the influence of aggressive market sentiment, investors tend to screen for and invest in companies with high growth prospects. This irrational behavior is highly likely to precipitate mispricing. Furthermore, when investors' average expectations are skewed, divergent opinions and views among investors further intensify stock mispricing (Han et al., 2022). Mature disclosure mitigates information asymmetry between investors and enterprises, reduces the cost of equity capital, thereby diminishing market valuation biases and alleviating mispricing. Specifically, earnings announcements alleviate information asymmetry and reduce divergence of opinion among investors, thereby mitigating stock mispricing (Berkman et al., 2009). Low-quality non-financial disclosures frequently serve as tools for impression management, whereby management manipulates the volume, format, and tone of such disclosures to embellish performance and influence share prices. This exacerbates information asymmetry, causing stock prices to diverge from their intrinsic value (Stagni & Santalo, 2025). Moreover, annual reports with lower readability trigger more pronounced stock pricing deviations (Chen et al., 2023), while corporate voluntary digital disclosures heighten investor attention and foster positive sentiment, thereby exacerbating stock mispricing (Zhou et al., 2025).

In short, stock pricing heavily relies on information disclosure, and ESG emerges as a critical non-financial information indicator for investors to assess a firm's future prospects. However, whether ESG rating disagreement influences investors' valuation judgments and decisions remains unclear, and relevant research in this area is limited. Therefore, we place ESG rating disagreement and stock mispricing within the same analytical framework. This not only helps unravel the potential impact of ESG rating disagreement in the stock pricing domain, but also offers a fresh outlook for further investigating the underlying mechanisms of stock mispricing.

3. Hypothesis development

3.1. ESG rating disagreement and stock mispricing

According to statistics from China Securities Depository and Clearing Corporation Limited, by 2023, the number of investors holding A-share accounts had surpassed 220 million[2]. Among these, the number of institutional investors stands at merely 500,000, accounting for less than 1% (Wu & Ren, 2025). The overwhelming majority are retail and small-to-medium investors who are relatively lacking in professional financial knowledge. These investors are more sus-

[2] On 13 November 2024, China Securities Depository and Clearing Corporation released the report titled "China Securities Depository and Clearing Corporation Statistical Yearbook", showing this data. The specific URL is http://www.chinaclear.cn/zdjs/tjnb/202411/25010f68524a4313b9325da84972b1b6/files/2023%E5%B9%B4%E7%BB%9F%E8%AE%A1%E5%B9%B4%E6%8A%A5.pdf

ceptible to interference from noise signals, largely triggering bounded rational or irrational expectations that cause share prices to deviate from their fundamentals. Regarding this reality, we import the limited attention theory and information cascade theory into our analysis to elaborate the impact of ESG rating disagreement on stock mispricing.

Limited attention theory posits that investors usually possess finite attention resources, with inherent limitations and constraints on their capacity to entirely comprehend enterprises (Hirshleifer & Teoh, 2003). Within Chinese capital markets, retail and small-to-medium investors' attention tends to be both dispersed and limited. Given these constraints on time and energy, the competitive or ambiguous information arising from ESG rating disagreement exacerbates information complexity, preventing investors from fully and promptly assimilating such information. Consequently, this surplus of redundant information is largely ineffective and negative, driving them highly likely to face an environment of information overload. Meanwhile, these investors with limited and fragmented attention often find themselves at an informational disadvantage (Feng et al., 2023), receiving predominantly partial information. They are inherently incapable of discerning and separating genuine ESG information. In such an ambiguous information environment, investors find it particularly challenging to grasp the full picture of corporate ESG performance or discern the motivations and incentives behind their ESG actions. This leads to considerable among investors when interpreting rating outcomes, thereby diminishing information transparency. Furthermore, diminished information transparency deprives investors of clear signals to guide their decisions (Bachner, 2025), making it considerably hard to accurately assess corporate true level of sustainable development. This compels investors to rely on superficial indicators and signs such as market trading volume when conducting transactions, thereby giving rise to irrational judgments and evaluations. Ultimately, the increased likelihood of irrational trading behavior causes stock prices to deviate from their intrinsic value due to the inclusion of excessive irrational factors.

Information cascade theory describes how individuals, when making decisions, are influenced by others' choices, abandoning personal judgment and forming a cascade-like chain reaction (Anderson & Holt, 1997). This phenomenon may trigger irrational decision-making. Also, information cascade theory demonstrates that irrational decisions may propagate when individuals largely base their choices on others' behavior rather than personal information. Investors in Chinese capital markets are predominantly retail and small-to-medium investors lacking financial literacy. Their insufficient capacity to access and process information necessitates reliance on timely and effective ESG disclosures to perceive corporate legitimacy. However, when there are significant discrepancies in ESG ratings, this inevitably conveys unignorable information noise to the market (Li & Chen, 2025). These investors may struggle to reasonably distinguish genuine ESG information from this noise and utilize noise as direct evidence for assessing corporate fundamentals. Consequently, the information noise arising from divergent ESG ratings not only exacerbates information asymmetry between enterprises and investors, but also introduces uncertainty into valuation judgments. When this uncertainty propagates and spreads among the vast and uninformed mass of investors, it provokes informational interference, thereby increasing the cost of identifying ESG idiosyncratic information. Thus, when the cost of acquiring and processing ESG information becomes prohibitively high for investors, they cease to distinguish between noise and substantive information, frequently basing their decisions on the actions of others. This phenomenon amplifies and propagates irrational decisions, causing stock mispricing.

Accordingly, we propose the following hypothesis.

H1: ESG rating disagreement exacerbates stock mispricing.

3.2. The moderating effect of cross-shareholding investors, media attention and marketization

The information environment both within and outside an enterprise plays a crucial role in enabling investors to obtain and process ESG information. When the quality of information transmission within and outside an enterprise is high, and noise in the stock market is reduced, the emotional impact on investors can be largely mitigated, thereby reducing the likelihood of stock mispricing. From the perspective of corporate governance, cross-shareholding investors generally exhibit abundant networked characteristics. They wield formidable information-gathering capabilities (Jang et al., 2022), transmitting ESG-related idiosyncratic information through equity networks to the stock market, thereby elevating ESG transparency. Meanwhile, the corporate external institutional environment also influences the effectiveness and timeliness of investors' information acquisition and processing. Media attention and marketization are also critical aspects in explaining the Chinese institutional context (Yang & Jiang, 2023). Therefore, we examine the moderating effects of cross-shareholding investors, media attention, and marketization on the impact of ESG rating disagreement on stock mispricing.

Assuming a pivotal form of relational networks, cross-shareholding investors play a vital role in facilitating information flow, ensuring that the shareholder social networks they constitute gain informational benefits (Hirose & Matsumura, 2022). It is worth noting that, leveraging their information advantage, cross-shareholding investors possess both the incentive and capability to mitigate the impact of ESG rating disagreement on stock mispricing. As the primary bearers of the economic consequences following the implementation of corporate strategy, shareholders inevitably suffer damage to both their short-term and long-term returns when stock mispricing diminishes market performance and value (Lewellen & Lowry, 2021). Thus, cross-shareholding investors possess an incentive to exchange information within social networks. Relying on their proprietary informational advantage and industry expertise, they can extract more relevant and reliable ESG information from their networks. This enables the transmission of firm-level ESG idiosyncratic information to the stock market, further enhancing the accessibility of real ESG information and mitigating the uncertainty arising from ESG rating disagreement. Moreover, compared to investors who focus solely on a single firm, the information network formed through diversified holdings strengthens the ESG information screening and interpretation capabilities of cross-shareholding investors. The information economies of scale arising from holding equity in peer firms effectively reduce the information integration cost (Gibbon & Schain, 2023). And extensive social network connections foster the relevance and reliability of ESG information, enabling them to access timely, comprehensive and accurate ESG information at lower cost and with greater convenience, thereby largely improving market information efficiency.

Accordingly, we propose the following hypothesis.

H2: Cross-shareholding investors weaken the impact between ESG rating disagreement and stock mispricing.

The vital role of the media in the Chinese stock market is increasingly acknowledged. On the one hand, the media facilitates the establishment of an information intermediary between retail and small-to-medium investors and enterprises (Peress, 2014). Through publicly releasing their own research reports or republishing coverage, the media extensively convey their proprietary insights, perceptions, evaluations, and forecasts regarding corporate ESG

performance to investors, thereby accelerating and broadening the dissemination of ESG information. Such information is more inclusive, helping to improve the information environment for investors, resolve information asymmetry between investors and enterprises, and correct ESG misjudgments. On the other hand, the media plays a vital role in overseeing corporate conduct (Liu et al., 2023). It is particularly noteworthy that negative coverage typically exerts a stronger influence, and the media also exhibits a preference for focusing on and exposing negative information. For firms with ESG ratings disagreement, the media tends to focus more attention on their lowest ESG rating (Capelle-Blancard & Petit, 2019), highlighting negative information and increasing targeted coverage accordingly. This would further heighten public scrutiny and potentially prompt regulatory intervention, not only significantly increasing the likelihood of strategic ESG-related actions by firms coming to light, but also diminishing managerial ability to properly address such misconduct. These contribute to strengthening transparency and reducing the potential for disagreements in ESG ratings. In short, the media's role as an information intermediary and watchdog facilitates greater investor access to corporate ESG private information, thereby largely reducing the informational interference caused by disagreements in ESG ratings on investors' decision-making.

Accordingly, we propose the following hypothesis.

H3: Media attention weakens the impact between ESG rating disagreement and stock mispricing.

The degree of marketization in the region where an enterprise operates serves as a safeguard for information transmission. On the one hand, a higher degree of marketization signifies more developed infrastructure and a more dynamic market. Information and resources circulate more smoothly and rapidly (Wang & Qian, 2011), thereby aiding in eliminating regional fragmentation to a greater extent. Specifically, marketization facilitates communication and experience-sharing among ESG rating agencies, helping to diminish the fragmentation of ESG rating systems and differences between rating agencies. This reduces the likelihood of inconsistent ESG ratings, gradually transforming the "divergence noise" of ESG ratings into "marginal information". It also may weaken redundant information from differently oriented ratings within the ESG rating ecosystem, curb disruptive effects, and improve the information environment for the vast number of retail investors assessing corporate ESG performance. On the other hand, marketization could support constraints on governmental power (Gang et al., 2012). Marketization ensures that resource allocation within the stock market is optimized with minimal interference from administrative planning and directives, while also safeguarding the stability of ESG-related policies. These components collectively contribute to stabilizing investor expectations, facilitating the correction of share prices and their return to intrinsic value. Moreover, in regions with a higher degree of marketization, the superior business environment and relatively well-established legal framework enable more extensive independent audit coverage and ESG reporting verification. Strong regulatory oversight can curb corporate ESG opportunism, reduce the likelihood of management obscuring or strategically framing ESG disclosures, and enhance transparency in information disclosure.

Accordingly, we propose the following hypothesis.

H4: Marketization weakens the impact between ESG rating disagreement and stock mispricing.

4. Methods

4.1. Sample selection and data source

We select Chinese A-share listed firms from 2015 to 2023 as the research sample. Since the promulgation and implementation of the revised Environmental Protection Law in 2015, it has further strengthened the integrity of corporate environmental information disclosure, with corporate environmental responsibilities increasingly drawing attention from both regulators and the market. These developments have propelled ESG disclosure toward greater standardization. Meanwhile, to ensure consistency in calculating ESG ratings, it is necessary to have at least two rating agencies cover the same firm in the same year. Considering that a significant increase in the number of rating agencies conducting ESG ratings began in 2015, the sample period starts from 2015.

We utilize non-financial firms as our initial sample, excluding ST, *ST, or PT firms and those with obvious data omissions. This results in 19,746 unbalanced panel observations. The ESG rating data comes from various rating agencies, the media coverage data comes from the CNRDS database, and the other corporate data comes from the Wind and CSMAR databases. Besides, all continuous variables are winsorized at the 1% and 99% level.

4.2. Variable definitions and measurements

The dependent variable is stock mispricing (Mispricing). In line with the similar study (Doukas et al., 2010), stock mispricing is measured by the industry relative valuation method. This method first defines the sum of the market value of common stock and the book value of liabilities of each company in the firm's industry for each year as Market, total assets as Asset, and the median of the ratio of the two as Ratio. Second, the base value ($Asset_{i,t}$*$Ratio$) of all listed firms in the industry is calculated, comparing their actual value ($Market_{i,t}$) to their base value ($Asset_{i,t}$*$Ratio$), and finally measure the mispricing level of the company relative to other companies in the industry. Specifically, in Model (1), i denotes the firm and t represents the year.

$$Mispricing_{i,t} = \ln\left(\frac{Market_{i,t}}{Asset_{i,t} \times Ratio}\right). \tag{1}$$

The independent variable is ESG rating disagreement (Disagreement). Referring to similar studies (Serafeim & Yoon, 2023), we use the standard deviation of ESG ratings for the same firm from six ESG rating agencies to measure ESG rating disagreement. First, we convert the ESG rating results, which are graded, into corresponding scores. Second, we standardize the results using Z-scores. Finally, we measure the ESG rating disagreement using the standard deviation of the ESG ratings from six rating agencies. Model (2) shows the calculation method.

$$Disagreement_{i,t} = \left[\frac{1}{G_i}\sum_{g=1}^{G}(ESG\_Z_{i,g,t} - \overline{ESG\_Z_{i,t}})^2\right]^{1/2}, \quad G_i = 2,3...6. \tag{2}$$

Among Model (2), $ESG\_Z_{i,g,t}$ is the ESG rating score of firm i in year t obtained by rating agency g using Z-score standardization. $\overline{ESG\_Z}$ is the average ESG score obtained by firm i from various rating agencies during the current year. G_i is the number of rating agencies that conduct ESG ratings for firm i. The value range of G_i is from 2 to 6.

The moderating variables are cross-shareholding investors, media attention and marketization.

Regarding cross-shareholding investors, they are defined as shareholders who simultaneously hold stakes in multiple firms within the same industry during each quarter, with each holding amounting to no less than 5%. Building upon prior research (He et al., 2019), we calculate the sum of the proportions of listed firm shares held by cross-shareholding investors at the quarterly level, then derive the annual average to determine the shareholding ratio of cross-shareholding investors, thereby measuring cross-shareholding investors (Cross-share).

Regarding media attention, we directly employ ESG-related media coverage (Coverage) to measure the media's role as an information intermediary (Kim et al., 2025). The greater the Coverage value, the stronger the information intermediation of the media. Also, following the methodology of Long et al. (2025), we utilize Model (3) to measure the role of media monitoring (Monitor). A higher value of Monitor indicates stronger media monitoring.

$$Monitor_{i,t} = \frac{media\ negative\ coverage_{i,t} - media\ positive\ coverage_{i,t}}{media\ negative\ coverage_{i,t} + media\ positive\ coverage_{i,t}} \times \ln(total\ media\ coverage_{i,t} + 1). \quad (3)$$

Regarding marketization, based on the approach of similar studies (Fu et al., 2025), we comprehensively assess marketization at the city level (Marketization) by evaluating the relationship between government and market, the development of the non-state-owned economy, the maturity of product markets, the maturity of factor markets, the refinement of market intermediary organizations, and the robustness of the legal framework.

Following the practice of previous studies (Jiang et al., 2025; Yang et al., 2023), we select firm size (Size), firm age (Age), financial leverage (Lev), financial performance (ROA), growth rate of operating income (Growth), book-market value ratio (BM), break-even situation (Loss), board size (Board), CEO duality (Dual), shareholding concentration (Top) and separation of powers (Separate) as control variables. Table 1 shows the variable definitions.

Table 1. Variable definitions

Variable type	Variable name	Variable symbol	Variable definition
Dependent variable	Stock mispricing	Mispricing	Calculated using the industry relative valuation
Independent variable	ESG rating disagreement	Disagreement	Standard deviation of the normalized ESG ratings of six different agencies
Moderating variables	Cross-shareholding investors	Cross-share	The shareholding ratio of cross-shareholding investors
	Media attention	Coverage	ln (number of ESG-related media coverage + 1)
		Monitor	Measured by Model (3)
	Marketization	Marketization	Marketization Index at the city level
Control variables	Firm size	Size	The natural logarithm of the total number of assets
	Firm age	Age	The natural logarithm of the number of years since the establishment

End of Table 1

Variable type	Variable name	Variable symbol	Variable definition
	Financial leverage	Lev	Total liabilities to total assets
	Financial performance	ROA	Return on assets
	Growth rate of operating income	Growth	Ratio of operating income for the current year to operating income for the previous year-1
	Book-market value ratio	BM	Ratio of book value to total market value
	Break-even situation	Loss	Dummy variable: 1 = net profit is less than 0 and 0 = others
	Board size	Board	The natural logarithm of the total number of board members
	CEO duality	Dual	Dummy variable: 1 = the CEO and chairman of the board are the same person and 0 = others
	Shareholding concentration	Top	The number of shares held by the top five shareholders divided by the total number of shares
	Separation of powers	Separate	Proportion of control owned by the actual controller - proportion of ownership owned by the actual controller

4.3. Model setup

We use Model (4) to test H_1.

$$Mispricing_{i,t} = \alpha_0 + \alpha_1 Disagreement_{i,t} + \alpha_2 Controls_{i,t} + Firm + Year + \varepsilon_{i,t}. \quad (4)$$

In Model (4), $Mispricing_{i,t}$ is the dependent variable, $Disagreement_{i,t}$ is the independent variable, and $Controls_{i,t}$ encompasses all control variables. We also control for *Firm* and *Year* fixed effects. *i* denotes the enterprise and *t* denotes the year. $\varepsilon_{i,t}$ is the random disturbance term. We focus on the coefficient of α_1, which represents whether H_1 holds.

In order to test H_2, H_3 and H_4, we set up Model (5) to test.

$$Mispricing_{i,t} = \beta_0 + \beta_1 Disagreement_{i,t} + \beta_2 Moderating_{i,t} + \beta_3 Disagreement_{i,t} \times Moderating_{i,t} + \beta_4 Controls_{i,t} + Firm + Year + \varepsilon_{i,t}. \quad (5)$$

In Model (5), $Moderating_{i,t}$ denotes the moderator variables and $Disagreement_{i,t}$*$Moderating_{i,t}$, is a cross-term. The other variables are the same as those in Model (4). We focus on the coefficient of β_3, which indicates whether H_2, H_3 and H_4 hold.

5. Results

5.1. Descriptive statistics

Table 2 reports the descriptive statistics results. The median of stock mispricing is 0.0417, the maximum is 1.5850, the minimum is –0.7333, and the standard deviation is 0.3807, indicating

that there is a large difference in stock mispricing among most sample firms. The descriptive statistics for other variables are within reasonable ranges.

Table 2. Descriptive statistics

Variable	Obs	Mean	S.D	Median	Min	Max
Mispricing	19746	0.0417	0.3807	–0.0342	–0.7333	1.5850
Disagreement	19746	0.9257	0.7292	0.9830	0	2.8284
Cross-share	19746	0.0422	0.1170	0	0	0.6028
Coverage	19746	3.1800	1.9642	2.7726	0	9.3517
Monitor	19746	–0.7267	1.8733	–1.0880	–2.6580	5.1996
Marketization	19746	13.1265	2.4781	12.9827	8.3857	20.2485
Size	19746	22.3643	1.2924	22.1858	19.7773	26.4523
Age	19746	2.9883	0.2884	2.9957	2.0794	3.6109
Lev	19746	0.4225	0.1993	0.4145	0.0515	0.9017
ROA	19746	0.0391	0.0686	0.0384	–0.3750	0.2473
Growth	19746	0.1725	0.4348	0.1036	–0.6576	4.3304
BM	19746	0.6160	0.2605	0.6067	0.0641	1.2462
Loss	19746	0.1182	0.3228	0	0	1
Board	19746	2.1074	0.1979	2.1972	1.6094	2.7081
Dual	19746	0.2909	0.4542	0	0	1
Top	19746	0.5325	0.1488	0.5312	0.1875	0.8921
Separate	19746	4.4652	7.0880	0	0	28.5984

5.2. Baseline analysis

Columns (1)–(3) in Table 3 observe that the regression coefficient of Disagreement is significantly positive at the 1% level in favor of H_1. Above results show that ESG rating disagreement exacerbates stock mispricing.

Table 3. Baseline analysis

	(1)	(2)	(3)
	Mispricing		Mispricing
Disagreement	0.0769***	0.0215***	0.0126***
	(0.0052)	(0.0044)	(0.0025)
Size			0.1163***
			(0.0074)
Age			0.1348**
			(0.0560)
Lev			–0.0093
			(0.0227)
ROA			–0.1146***
			(0.0443)

End of Table 3

	(1)	(2)	(3)
	Mispricing		Mispricing
Growth			–0.0005
			(0.0032)
BM			–1.6311***
			(0.0189)
Loss			–0.0633***
			(0.0068)
Board			–0.0129
			(0.0157)
Dual			–0.0110**
			(0.0050)
Top			–0.0014***
			(0.0004)
Separate			0.0012**
			(0.0005)
Firm/Year	NO	YES	YES
Constant	–0.0295***	0.0218***	–1.8552***
	(0.0064)	(0.0040)	(0.2221)
Obs	19746	19746	19746
Adjusted-R^2	0.0217	0.6128	0.8635

Note: Standard errors in parentheses, *** p < 0.01, ** p < 0.05, * p < 0.1. Standard errors for all regressions are at the firm level for clustering process. The same applies to the following tables.

5.3. Endogeneity tests

Drawing upon similar studies (Wang et al., 2025), we employ the mean ESG rating disagreement within the same industry and during the same year as an instrumental variable (Disagreement-IV), utilizing two-stage least squares (2SLS) for endogeneity testing. Column (1) of Table 4 reports the result of the first-stage regression. The regression coefficient of Disagreement-IV is significantly positive. Column (2) reports the results of the second-stage regression. The coefficient of Disagreement is still significantly positive, which is consistent with H_1. In addition, the results of the unidentifiable test K-Paaprk LM, the weak instrument test C-Donald Wald F statistics and K-PaapWald rk F statistics are 22.23, 71.44 and 33.63, respectively, all of which are greater than the Stock-Yogo 10% critical value of 16.38, indicating that the IV do not have the concerns of unidentifiable and weak instrument.

To alleviate possible sample self-selection concerns, we employ the propensity score matching (PSM) method. Specifically, we assign a value of 1 to firms exhibiting ESG disagreement and 0 to those without. All control variables are treated as covariates in a 1:1 nearest neighbor matching process. The result in column (3) indicates that the coefficient of Disagreement remains significantly positive, supporting H_1. Table 5 shows that the mean values between the treatment and control groups exhibit no significant difference. The absolute values of the standard deviations for all characteristic variables post-matching do not exceed 10%, which satisfies the balance assumption.

In order to overcome the issue of sample selection bias as much as possible, we use a Heckman two-stage model. In the first stage, a dummy variable is set according to whether the firm has an ESG rating disagreement. We treat this variable as the dependent variable and use the control variables from the preceding period as independent variables to test whether they influence the ESG rating disagreement. In the second stage, we construct a Probit model, calculate the inverse Mir ratio (IMR), and then substitute the IMR into Model (4) to perform the regression analysis again. The coefficient of Disagreement in Column (4) is significantly positive, which is consistent with H_1.

We reintroduce the first-order lagged term of the independent variable into the regression analysis of Model (4). Column (5) shows that l.Disagreement remains significantly positive, validating H_1.

Table 4. Endogeneity tests

	IV		PSM	Heckman	Lag period
	(1) Disagreement	(2) Mispricing	(3) Mispricing	(4) Mispricing	(5) Mispricing
Disagreement		0.1447***	0.0059**	0.0098***	
		(0.0527)	(0.0028)	(0.0026)	
IMR				0.0256	
				(0.0237)	
Disagreement-IV	0.4060***				
	(0.0700)				
l.Disagreement					0.0051**
					(0.0026)
Controls/Firm/Year	YES	YES	YES	YES	YES
Obs	19338	19338	12098	15076	15076
Adjusted-R^2	0.9001	0.5670	0.8873	0.9091	0.8827

Table 5. Balance test of PSM

Variable	Unmatched	Mean		Bias(%)	T-test	
	Matched	Treated	Control		t	P>|t|
Size	U	22.3730	22.3460	2.1	1.3300	0.1833
	M	22.2940	22.3510	–4.5	–2.4900	0.2130
Age	U	2.9686	3.0313	–22.1	–14.2600	0.0000
	M	3.0542	3.0276	9.4	5.4000	0.3310
Lev	U	0.4235	0.4202	1.7	1.0900	0.2760
	M	0.4233	0.4207	1.3	0.7400	0.4570
ROA	U	0.03872	0.0399	–1.7	–1.1200	0.2640
	M	0.04254	0.0394	4.5	2.5800	0.3100
Growth	U	0.1770	0.1628	3.3	2.1300	0.0330
	M	0.2237	0.1571	9.5	6.8200	0.1051
BM	U	0.5915	0.6696	–19.8	–19.7300	0.0000
	M	0.7059	0.6638	8.8	9.2900	0.0550

End of Table 5

Variable	Unmatched	Mean		Bias(%)	T-test	
	Matched	Treated	Control		t	P>|t|
Loss	U	0.1182	0.1180	0.1	0.0500	0.9620
	M	0.1020	0.1209	–5.8	–3.3000	0.9630
Board	U	2.1096	2.1027	3.5	2.2800	0.0230
	M	2.1059	2.1025	1.7	0.9600	0.3390
Dual	U	0.2876	0.2984	–2.4	–1.5500	0.1210
	M	0.2858	0.3002	–3.2	–1.7400	0.1820
Top	U	53.0180	53.7460	–4.9	–3.1900	0.0010
	M	54.4880	53.6360	5.7	3.1600	0.1420
Separate	U	4.4825	4.4275	0.8	0.5100	0.6130
	M	4.4278	4.4180	0.1	0.0800	0.9400

5.4. Robust tests

Firstly, we employ the difference between the highest and lowest ratings as a proxy variable for measuring ESG rating disagreement. Secondly, further control of high-dimensional fixed effects can often eliminate the influence of a large number of interfering factors, such as heterogeneous regional environments and macro time-varying factors. Column (2)–(4) report the results of controlling for "industry-year", "region" in which the firm operates along with "region-rear" in Model (4), respectively. Thirdly, given that two major exogenous shocks occurred during the research period, namely the 2015 stock market crash and the 2020 public health crisis, we exclude the 2015, 2020 and later samples. Finally, considering that control variables may be correlated with ESG rating disagreement, which could potentially distort the estimation in the baseline analysis results, all control variables are lagged by one period. All results in Table 6 show that the coefficient of Disagreement is still significantly positive, supporting H1.

Table 6. Robustness tests

	(1) Substitution of independent variable	(2) Control Industry-Year	(3) Control City	(4) Control City-Year	(5) Remove special years	(6) Control variable lag
	Mispricing	Mispricing	Mispricing	Mispricing	Mispricing	Mispricing
Disagreement	0.0143***	0.0138***	0.0123***	0.0104***	0.0105***	0.0139***
	(0.0026)	(0.0025)	(0.0025)	(0.0027)	(0.0031)	(0.0041)
Controls/Firm/Year	YES	YES	YES	YES	YES	YES
Industry-Year fixed	NO	YES	NO	NO	NO	NO
City fixed	NO	NO	YES	NO	NO	NO
City-Year fixed	NO	NO	NO	YES	NO	NO
Obs	19746	19746	19746	19746	10159	15076
Adjusted-R^2	0.6290	0.8710	0.8628	0.8645	0.8735	0.7032

5.5. Moderating mechanism analysis

We reveal that the coefficients of Disagreement*Cross-share, Disagreement*Coverage, Disagreement*Monitor and Disagreement*Marketization in Table 7 are all significantly negative. Meanwhile, the coefficient of Disagreement still remains significantly positive. These results support H2, H3 and H4, indicating that cross-shareholding investors, media attention and marketization mitigate the relationship between ESG rating disagreement and stock mispricing. These findings align with prior research, demonstrating that internal corporate governance and external environments play a pivotal role in effectively conveying idiosyncratic information (Filatotchev & Nakajima, 2010). Firstly, cross-shareholding investors transmit ESG-related information to the stock market through information networks and governance advantages, thereby reducing investor confusion and noise interference arising from divergent ESG ratings. Secondly, media attention, through information mining, dissemination and public oversight, largely mitigates divergent investor beliefs arising from ESG disagreements and corrects their subsequent divergent judgments. Finally, marketization ensures rational resource allocation, while the accessible and rapid circulation of real ESG information promotes transparency, stabilizes investor sentiment and corrects decision-making expectations.

Table 7. Moderating mechanism analysis

	(1)	(2)	(3)	(4)
	Mispricing	Mispricing	Mispricing	Mispricing
Disagreement	0.0120***	0.0119***	0.0122***	0.0120***
	(0.0025)	(0.0025)	(0.0025)	(0.0025)
Cross-share	0.0075			
	(0.0299)			
Disagreement*Cross-share	–0.0764***			
	(0.0227)			
Coverage		0.0050***		
		(0.0017)		
Disagreement*Coverage		–0.0043***		
		(0.0010)		
Monitor			0.0040***	
			(0.0009)	
Disagreement*Monitor			–0.0041***	
			(0.0010)	
Marketization				0.0085**
				(0.0034)
Disagreement*Marketization				–0.0037***
				(0.0009)
Controls/Firm/Year	YES	YES	YES	YES
Obs	19746	19746	19746	19746
Adjusted-R^2	0.8636	0.8637	0.8638	0.8637

5.6. Heterogeneity analysis

We divide the sample firms into two categories according to the nature of property rights: state-owned and private enterprises. Columns (1) and (2) of Table 8 show that the impact of ESG rating disagreement on stock mispricing is more pronounced in state-owned enterprises. The result of Fisher combination test is significant and supports this finding. Due to national macro-level regulations and the special nature of state-owned enterprises themselves, some incremental information of state-owned enterprises is not completely accessible or interpreted by investors. Conversely, private enterprises that target a wider retail investor base are more inclined to disclose incremental ESG information. Moreover, since state-owned enterprises receive extensive support (financial, tax, etc.) from the central or local government, their ESG behavior is mostly policy-driven. The implementation process and ultimate achievement of ESG in state-owned enterprises are more concerned with the overall social benefit, so the signaling effect at the market level is limited. As a result, this correction is more pronounced in state-owned enterprises.

In accordance with the Industry Classification Catalogue for Environmental Protection Verification of Listed Companies, we divide the sample firms into heavily polluting enterprises and non-heavily polluting enterprises, employing a grouped regression approach to test for industry attribute heterogeneity. Columns (3) and (4) indicate that the impact of ESG rating disagreement on stock mispricing is more pronounced among heavily polluting enterprises. The Fisher combination test exhibits that the difference in coefficients between groups is also significant. Compared with non-heavily polluting enterprises, heavily polluting enterprises face stricter external environmental regulations and greater pressure for green governance and emissions reduction. Moreover, the ESG performance of heavily polluting enterprises is an important indicator for stakeholders in assessing their sustainable development prospects. And investors exhibit heightened sensitivity towards the ESG performance of such enterprises. When significant disagreements exist in the ESG ratings of heavily polluting enterprises, investors become more susceptible to emotional fluctuations, heightening the likelihood of irrational investment decisions. Consequently, among heavily polluting enterprises, ESG rating disagreement exerts a more pronounced influence on stock mispricing.

We divide the sample firms into two categories according to the differences in institutional investors' shareholding preferences: long-term and short-term institutional investors' shareholdings. Columns (5) and (6) reveal that the impact of ESG rating disagreement on stock mispricing is more pronounced in firms with short-term institutional investors shareholdings. Unlike short-term institutional investors, long-term institutional investors generally continue to follow the prolonged goals and interests in order to share a stable return on value, so their attention and resource allocation may be more inclined. Based on their professional insights, long-term institutional investors are more motivated and willing to collect, integrate and convey high-cost information about the corporate fundamental value. Meanwhile, long-term institutional investors have outstanding governance and supervision effectiveness, which promote higher quality of information disclosure, reasonably guarantee the information content and decision-making value of ESG, and the timeliness and reliability of information. Therefore, in firms with short-term institutional investors' holdings, this association is more pronounced.

Table 8. Heterogeneous analysis

	(1) SOE	(2) NSOE	(3) Heavily polluting enterprises	(4) Non-heavily polluting enterprises	(5) Long-term institutional investor holdings	(6) short-term institutional investors holdings
	Mispricing	Mispricing	Mispricing	Mispricing	Mispricing	Mispricing
Disagree-ment	0.0143***	0.0091***	0.0169***	0.0105***	0.0027	0.0095**
	(0.0044)	(0.0031)	(0.0052)	(0.0028)	(0.0040)	(0.0039)
Controls/ Firm/Year	YES	YES	YES	YES	YES	YES
Obs	6935	12810	4136	15610	8654	8123
Adjusted-R^2	0.8514	0.8759	0.8462	0.8700	0.8764	0.8690
P value	0.000***		0.005***		0.081*	

6. Discussion

A branch of growing literature has validated that for less-informed investors with limited access to information, corporate ESG performance generally and closely serves as a reliable strategic signal. Small and medium-sized retail investors derive fundamental value references and signal guidance from this ESG information, which are essential for their judgment and decision-making processes, thereby facilitating the valuation correction (Chen & Wu, 2025). However, we observe that ESG rating disagreement induces distortions in this price discovery process. This finding strongly supports the insight that ESG rating disagreement exhibits a noise effect within the Chinese emerging stock market, which provides a more in-depth exploration than previous studies (Wang et al., 2024). Namely, we verify that the divergent interpretations of ESG information by different rating agencies substantially obscure and mask corporate real ESG performance (Li & Lai, 2026). This undoubtedly exacerbates the information asymmetry between small and medium-sized retail investors and enterprises, substantially diminishing the utility and credibility of ESG rating information for investors' decision-making. Consequently, the reference value of ESG performance itself is undermined. When investors lack a benchmark for reasonably assessing corporate ESG performance, their divergent opinions and cognitive biases generate differing expectations, causing share prices to deviate from intrinsic value. We also corroborate that discrepancies in ESG ratings could generate excessive and redundant information (Liu et al., 2024), resulting in mixed signals that deter investors from obtaining clear guidance. ESG rating disagreement generates increased noise that elevates investors' costs of absorbing, processing, and interpreting information. This diverts their already limited attention towards irrelevant information, steering them away from value-driven insights. When investors base trading decisions on noise unrelated to corporate intrinsic worth, stock prices become increasingly distorted by excessive noise and fail to reflect true value. This induces systemic bias, ultimately triggering mispricing.

Concurrently, we incorporate contextual factors to demonstrate that cross-shareholding investors, media attention, and marketization weaken the relationship between ESG rating disagreement and stock mispricing. Cross-shareholding investors, media attention and marketization could collectively reduce investors' information processing costs, enhance information processing efficiency, mitigate disputes arising from ESG rating disagreement, and

encourage investors to align more closely with ESG-related value information. Ultimately, this mitigates the impact of ESG rating disagreement on stock mispricing. Specifically, we validate that cross-shareholding investors, leveraging their extensive governance experience and unique informational advantages (Muramiya & Takada, 2020), amplify the spillover effects of idiosyncratic ESG information. This improves the relevance and reliability of ESG information for investors, ultimately reducing noise interference. Concurrently, we confirm that media attention broadens and extends the dissemination of private and hidden ESG information, monitors managerial strategic ESG behaviors (Graf-Vlachy et al., 2020), thereby elevating ESG transparency. This assists investors in discerning a firm's genuine ESG performance and correcting their divergent perceptions. Moreover, we confirm that a high degree of marketization poses a more well-developed information infrastructure and more dynamic markets (Hou et al., 2021), where ESG-related idiosyncratic information flows more smoothly and rapidly. This enhances the information environment for investors, thereby stabilizing market expectations and weakening mispricing.

7. Conclusions

7.1. Theoretical implications

This study makes several contributions to the existing literature. Firstly, this paper reveals how the limited attention theory and information cascade theory can be leveraged as an insightful perspective to analyze the interactive association between ESG disagreement and stock mispricing among the emerging stock market. This dual influential theoretical perspective that connects information disagreement of ESG information divergence which are information providers and limited attention of investors who are information recipients, goes beyond the understanding of the existing relationship between single ESG performance and stock pricing. Secondly, our findings advance existing research on ESG rating disagreement by revealing their impact on the stock market. We confirm that ESG rating disagreement inherently introduces ambiguity in information quality and overload in information quantity, disrupting investor decision-making and causing stock prices to deviate from intrinsic value. This insight largely extends beyond existing research focusing on how ESG performance can correct stock mispricing. Finally, our study offers a fresh perspective by capturing the contextual factors to alleviating the relationship between ESG rating disagreement and stock mispricing. This adds depth to our understanding of the antecedent about stock mispricing and provides a better understanding of the theoretical basis for mitigating stock mispricing.

7.2. Practical implications

Firstly, we discover that ESG rating disagreement exacerbates stock mispricing. Thus, government regulators should strengthen guidance and oversight of ESG rating agencies, establishing platforms to facilitate two-way communication between investors and rating agencies, thereby elevating the comprehensibility of ESG disclosures. Also, they should improve the consistency of ESG information disclosure by defining clear rating scopes, standardizing rating criteria, and formalizing rating procedures. Moreover, they ought to comprehensively consider both qualitative and quantitative disclosure metrics, formulating differentiated and diversified ESG disclosure policies tailored to different types of enterprises to elevate the comparability of ESG disclosures.

Secondly, we indicate that cross-shareholding investors weaken the impact of ESG rating disagreement on stock mispricing. Therefore, enterprises should attach great importance to the potential advantages and value of interconnected shareholder networks and information hubs, actively attracting shareholders with extensive social connections to further establish robust, mutually trusting networks of linked shareholders. Relying on their informal relationship networks, transaction costs associated with information transmission and sharing can be reduced, particularly concerning idiosyncratic and hidden information such as certain corporate real ESG performance. Also, we insist that media attention can alleviate the impact of ESG rating disagreement on stock mispricing. Consequently, the media should fortify the independence and professionalism of their ESG-related reporting, promptly exposing corporate conduct that violates ESG principles. Simultaneously, they should implement tiered and categorized ESG coverage tailored to corporate own characteristics, enabling investors to gain a comprehensive understanding of corporate ESG performance. Furthermore, we reveal that marketization alleviates the impact of ESG rating disagreement on stock mispricing. Accordingly, the government should continue to advance market-oriented reforms, establishing an information bridge for ESG communication between investors, enterprises and rating agencies to eliminate information barriers. Simultaneously, targeted support should be provided to regions with lower market development levels, thereby further balancing disparities in capital market infrastructure and other aspects across regions.

Finally, we show that the influence of ESG rating disagreement on stock mispricing is more pronounced in firms with state-owned, heavy pollution and short-term institutional investor holdings. Thus, when formulating ESG assessment criteria, rating agencies should give due consideration to the nature of corporate ownership, the industry in which the enterprise operates, and the shareholding status of institutional investors. They ought to place greater emphasis on the characteristics of different types of enterprises, thereby developing and implementing categorized rating indicators in a targeted manner. Concurrently, the policy-makers ought to strengthen ESG disclosure requirements for enterprises that are state-owned, heavily polluting, or have a high proportion of short-term institutional holdings. Such measures could provide comprehensive information support for rating agencies conducting ESG assessments and offer effective guidance for investors to make sound investment decisions.

7.3. Limitations and future research directions

This study still has several limitations. Machine learning and Bayesian networks may be better equipped to identify and explore deep causal relationships. In future research, grounded in this method, the results of more ESG rating agencies can be included to conduct international comparative studies of emerging and mature capital markets on a global scale. Moreover, further research can evaluate the different impacts of discrepancies in ESG rating sub-items on stock mispricing and their intriguing mechanisms.

Author contributions

Jiangzhi Yu conceived the study and was responsible for the resources, formal analysis, data collation and Writing – original draft. Shenglin Ma were responsible for conceptualization, methodology, writing – review & editing.

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