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DP2026-30

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November 2, 2026

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Abstract

ESG rating disagreement is often viewed as a source of information uncertainty, yet divergent ratings may also encourage information acquisition and interpretation. This study examines the relationship between ESG rating disagreement and firm value from an information-intermediation perspective, focusing on the role of analyst attention. Using data from 893 Chinese A-share listed firms over 2018–2024 and ESG ratings from Bloomberg, Huazheng, and Wind, we find that greater rating disagreement is positively associated with firm value and analyst attention. Bootstrap results further reveal a significant indirect association between rating disagreement and firm value through analyst attention, which remains evident when rating disagreement is lagged by one year. The dimension-specific analysis provides the clearest evidence for the social dimension, although differences in indirect effects across ESG dimensions are not statistically significant. Further analysis indicates that the positive association between social-dimension rating disagreement and analyst attention is weaker among state-owned firms, while the positive association between analyst attention and firm value is weaker when stock trading activity is higher. These findings highlight the role of information intermediation in understanding the valuation implications of ESG rating disagreement and identify dimension-specific patterns and stage-specific boundary conditions.

Keywords: ESG rating disagreement; Analyst attention; Firm value; Information intermediation; ESG dimensions

JEL classification: G14; G32; M14; Q56

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1. Introduction

Environmental, social, and governance (ESG) evaluation frameworks are increasingly incorporated into capital market assessments of firms' non-financial performance and long-term risks. In practice, these frameworks are operationalized through ESG ratings, which translate multidimensional assessments into comparable firm-level evaluations. Yet different rating providers often assign substantially different ratings to the same firm. Such disagreement can arise from differences in indicator coverage, weighting schemes, data sources, and measurement approaches, even when rating agencies evaluate broadly similar underlying corporate information (Berg et al., 2022; Christensen et al., 2022; Kimbrough et al., 2024). ESG rating disagreement therefore represents a potentially relevant information phenomenon in capital markets (Bissoondoyal-Bheenick et al., 2024).

Existing evidence on the capital market implications of ESG rating disagreement remains mixed. One strand of the literature emphasizes the additional uncertainty and information frictions associated with inconsistent ratings, which may make it more difficult for investors to evaluate firms' underlying ESG performance (Avramov et al., 2022; Christensen et al., 2022). Consistent with this view, Serafeim and Yoon (2023) show that rating disagreement weakens the incorporation of value-relevant ESG news into stock prices, whereas Zeng et al. (2025) document a positive association between rating disagreement and stock returns linked to idiosyncratic volatility risk. More recent studies further suggest that disagreement may stimulate information acquisition and interpretation, including greater analyst attention and research activity (Cai et al., 2026; Guo et al., 2026; Li & Chen, 2025; Yin et al., 2025).

Several questions nevertheless remain less clear. First, although recent studies have begun to examine analyst responses to ESG rating disagreement, relatively little is known about whether analyst attention helps explain the association between ESG rating disagreement and firm valuation. Second, aggregate ESG disagreement may conceal meaningful differences across the environmental, social, and governance dimensions, which differ in their information sources, observability, and measurement structures. Third, the relevance of analyst intermediation may vary across firm and market environments. Ownership structure may shape the extent to which external information intermediaries are relied upon, while trading conditions may affect the marginal valuation relevance of analyst-produced information.

To address these questions, this study examines Chinese A-share listed firms from 2018 to 2024 and constructs firm-year measures of ESG rating disagreement using ratings from Bloomberg, Huazheng, and Wind. China provides a useful setting because domestic and international rating providers coexist but differ substantially in their evaluation frameworks, information sources, and weighting schemes. The final sample consists of 893 firms and 6,251 firm-year observations.

The results show that ESG rating disagreement is positively associated with firm value and analyst attention, with a significant indirect association through analyst attention. The dimension-specific analysis provides the clearest empirical evidence for the social dimension, although formal comparisons do not indicate statistically

significant differences in indirect associations across dimensions. Ownership structure and stock trading activity are associated with different stages of the analyst-attention channel. These findings contribute to the literature in three respects. First, this study complements emerging research on ESG rating disagreement and firm valuation by examining analyst attention as an information-intermediation channel. Second, it provides dimension-specific evidence on this channel while distinguishing the clearest within-dimension pattern from formal cross-dimension differences. Third, it identifies stage-specific boundary conditions, with ownership-related heterogeneity concentrated mainly in the association between social-dimension rating disagreement and analyst attention, and stock trading activity primarily conditioning the association between analyst attention and firm value.

The remainder of the paper is organized as follows. Section 2 reviews the related literature. Section 3 develops the hypotheses. Section 4 describes the data, variables, and empirical strategy. Section 5 presents the empirical results. Section 6 discusses the findings and their implications, and Section 7 concludes.

2. Literature Review

2.1 ESG Rating Disagreement, Analyst Attention, and Firm Value

Existing studies report mixed capital market consequences of ESG rating disagreement. One strand emphasizes the information uncertainty and asymmetry associated with inconsistent ratings and their potential implications for analyst forecasting and market pricing. For example, Liu et al. (2024) find that greater ESG rating disagreement is associated with larger analyst forecast errors and greater forecast dispersion. Related evidence from China links ESG rating disagreement to stock returns and volatility, with these associations varying with external attention and disclosure quality (Li & Lai, 2026; Tan & Pan, 2023). More recent studies, however, document potentially favorable capital market associations. Yin et al. (2025) show that ESG rating disagreement is associated with improved stock pricing efficiency and lower information asymmetry; Guo et al. (2026) document a negative relationship between ESG rating disagreement and stock price crash risk; and Cai et al. (2026) find a positive relationship between ESG rating disagreement and stock liquidity. This evidence supports a potential information-intermediation role for analysts in the presence of inconsistent ESG assessments.

Analysts may play an important role in this information-processing process. Li and Chen (2025) find that ESG rating disagreement is associated with improved analyst forecast quality through greater analyst attention. Cai et al. (2026) further show that analyst attention and research report attention mediate the relationship between ESG rating disagreement and stock liquidity, while Guo et al. (2026) document greater analyst coverage and research report production when rating disagreement is higher. More broadly, prior research suggests that the information-intermediation role of analysts becomes more important when firms face greater information uncertainty or are more difficult to value (Loh & Stulz, 2018), while higher analyst coverage can

reduce information asymmetry and equity mispricing (Li, 2020). These findings suggest that analysts may help interpret inconsistent ESG information and facilitate its incorporation into capital market prices.

Existing research on analyst responses to ESG rating disagreement has focused mainly on analyst forecasting, stock liquidity, and stock price risk. How analyst attention is involved in the relationship between ESG rating disagreement and firm valuation, and whether this process varies across ESG dimensions and market environments, remains less understood.

2.2 Dimension-Specific Differences in ESG Rating Disagreement

The environmental, social, and governance dimensions of ESG ratings differ substantially in their evaluation targets, information sources, and measurement approaches. The environmental dimension mainly covers issues such as carbon emissions, energy use, resource management, and climate risk, and relies relatively more on quantifiable environmental performance indicators. The social dimension encompasses stakeholder-related issues such as employee rights, human capital, consumer responsibility, supply chains, and community relations, for which information sources are more dispersed and some indicators are more qualitative in nature. The governance dimension primarily focuses on institutional arrangements such as board structure, shareholder rights, executive incentives, and internal control. Muñoz-Torres et al. (2019) identify clear differences across dimensions in evaluation focus and information orientation, while OECD (2025) documents substantial variation across major ESG rating products in indicator coverage, information type, and comparability.

Cross-provider consistency also varies across dimensions. Widyawati (2021) documents substantial differences across ESG rating products in dimensional composition, measurement approaches, and validity, highlighting heterogeneity across measurement frameworks. Berg et al. (2022) show that disagreement across rating providers arises mainly from differences in scope, measurement, and weighting, with consistency also varying across the E, S, and G dimensions. Billio et al. (2025) similarly document substantial cross-provider disagreement within individual ESG dimensions, while Anselmi and Petrella (2025) show that disagreement evolves differently across the environmental, social, and governance pillars. These findings suggest that aggregate ESG ratings may conceal structural differences across dimensions in information content and rating consistency.

The economic implications of dimension-specific rating disagreement may also vary. Chen et al. (2025), for example, find that corporate ESG washing is associated with greater rating divergence, with the pattern driven primarily by greenwashing in the environmental dimension. Wang et al. (2024) find that the negative association between ESG rating disagreement and stock returns is mainly driven by disagreement in the governance dimension. Teng et al. (2025) further argue that the dimensions differ in the observability and verifiability of their underlying information and document different associations between E-, S-, and G-dimension disagreement and firms' subsequent ESG

performance. These studies suggest that dimension-specific rating disagreement may reflect different evaluation systems and information structures and may therefore carry different informational and economic implications. Aggregate ESG disagreement may consequently obscure dimension-specific patterns, motivating separate examination of E-, S-, and G-dimension disagreement in subsequent information-intermediation processes.

2.3 Boundary Conditions of the Analyst Attention Channel

Existing studies suggest that the economic consequences of ESG rating disagreement vary across firms' market characteristics and institutional environments (Rubino et al., 2024). Zhang et al. (2024) find that ESG rating disagreement is more strongly associated with modified audit opinions among firms with lower institutional ownership, weaker internal controls, and non-state ownership. He et al. (2025) similarly show stronger associations with the cost of equity financing among firms with weaker governance quality, lower ESG disclosure standardization, and non-state ownership, while Zhang et al. (2025) document stronger debt-financing effects among non-state-owned firms and firms operating in weaker contracting environments. These studies suggest that inconsistent ESG assessments may be more relevant to external market participants when firms have fewer alternative information sources or weaker institutional support. This pattern may also imply greater reliance on external information intermediaries among non-state-owned firms.

Market conditions may also shape how information associated with ESG rating disagreement is transmitted and incorporated into prices. Yin et al. (2025) find that the positive relationship between ESG rating disagreement and pricing efficiency is more pronounced during periods of lower market sentiment, lower volatility, and lower turnover, and attribute this pattern to investor learning from the diverse information provided by different rating agencies. Quotb et al. (2026) further show that greater ESG rating disagreement is associated with lower abnormal trading volume, with stronger effects among firms with lower analyst coverage and higher stock volatility, suggesting that existing information-production and trading conditions may influence how investors respond to inconsistent ESG signals. These findings suggest that trading conditions may shape the marginal valuation relevance of information supplied by professional intermediaries. When trading activity is relatively high, the incremental relevance of analyst-produced information may be lower because firm-related information is more frequently reflected through market transactions.

Overall, existing research suggests that the information implications of ESG rating disagreement may vary across firm- and market-level environments, motivating our examination of ownership structure and stock trading activity as boundary conditions of the analyst-attention channel.

3. Hypothesis Development

When different rating agencies assign substantially different ESG assessments to

the same firm, market participants may face greater ambiguity in interpreting any single rating. The resulting uncertainty may increase information-processing costs, while heterogeneous assessments may prompt further information search and interpretation. If this additional information processing helps identify valuation-relevant information, greater ESG rating disagreement may be positively associated with firm value. Therefore, we propose:

H1: ESG rating disagreement is positively associated with firm value.

This need for additional interpretation may increase demand for professional information processing. Recent evidence from China links ESG rating disagreement to greater analyst information-processing burdens and weaker forecast performance, while broader cross-agency dispersion is associated with lower forecasting benefits from ESG rating coverage (Cheng et al., 2025; Wang et al., 2025). More broadly, analysts tend to devote greater research effort when valuation uncertainty is higher, and such research can facilitate the incorporation of information into prices (Cui et al., 2022; Huang et al., 2023). If greater analyst attention facilitates the interpretation and incorporation of divergent ESG information, it may provide an indirect channel linking rating disagreement to firm value. Accordingly, we propose:

H2: Analyst attention mediates the association between ESG rating disagreement and firm value.

ESG comprises distinct environmental, social, and governance information dimensions, which can have different, and in some cases opposite, capital market implications (Gyönyör & Horváth, 2024). These differences suggest that rating disagreement across ESG dimensions may be associated with different information-processing demands and valuation implications. Accordingly, we ask:

RQ3: Does the analyst attention channel linking ESG rating disagreement to firm value vary across the environmental, social, and governance dimensions?

Ownership structure is closely related to firms' information environments and analyst participation (Wang et al., 2022), while affiliation with state-linked investment banks may provide information advantages to financial analysts (Liu & Liu, 2026). These institutional differences suggest that state-owned enterprises may rely less heavily on market-based information intermediaries than non-state-owned enterprises. Given the relatively dispersed information underlying social-dimension assessments, rating disagreement may create additional demand for external interpretation, particularly among non-state-owned firms. Accordingly, we propose:

H4: State ownership weakens the positive association between social-dimension ESG rating disagreement and analyst attention.

The valuation relevance of analyst information may also depend on market trading conditions. When trading activity is relatively low, information may be incorporated into prices less frequently through market transactions, increasing the marginal

relevance of information supplied by professional intermediaries (Yin et al., 2025). As trading activity increases, the incremental valuation relevance of analyst-produced information may therefore decline. Accordingly, we propose:

H5: Higher stock trading activity weakens the positive association between analyst attention and firm value.

4. Data and Empirical Strategy

4.1 Sample and Data Sources

The sample consists of Chinese A-share listed firms. ESG rating data are mainly obtained from three rating providers: Bloomberg, Huazheng, and Wind. These providers differ in their rating frameworks, indicator selection, weighting schemes, and information sources, providing the basis for constructing firm-level measures of ESG rating disagreement. Firm-level data on firm value, financial characteristics, stock trading, ownership structure, and analyst attention are mainly obtained from the China Stock Market & Accounting Research Database (CSMAR). Observations from different data sources are matched by stock code and year.

The sample period spans 2018–2024, primarily reflecting the continuous availability of ESG rating data and the institutional context of the Chinese ESG disclosure environment. Among the ESG rating data used in this study, Wind provides relatively complete continuous records from 2018 onward. The revised Code of Corporate Governance for Listed Companies issued in 2018 also introduced disclosure requirements related to environmental responsibility, social responsibility, and corporate governance, reflecting the continued development of the ESG disclosure framework for Chinese listed firms during this period (CSRC, 2018). The sample ends in 2024 because, at the time of data collection, some financial, corporate governance, and ESG rating data for 2025 had not yet been fully disclosed. This cutoff also limits the sample's extension into subsequent periods following further changes to China's sustainability disclosure rules from 2024 onward, which may affect firms' disclosure behavior and ESG rating outcomes (Shanghai Stock Exchange, 2024; Shenzhen Stock Exchange, 2024).

We first match the ESG rating data from Bloomberg, Huazheng, and Wind at the firm-year level. During 2018–2024, 1,007 firms have ratings from all three providers in at least one year, although the number of matched firms varies across years. These matched firm-year observations are used to construct the ESG variables. We then require continuous three-provider coverage throughout 2018–2024, resulting in 984 firms. After excluding financial firms, ST and *ST firms[1], and firms with substantial missing values in key variables, the final balanced panel consists of 893 firms and 6,251 firm-year observations. Detailed sample construction is reported in Appendix Table A.

[1] In China's A-share market, ST refers to Special Treatment, a regulatory label applied to listed firms with abnormal financial or operating conditions. *ST refers to Special Treatment with a delisting risk warning.

4.2 Variables and Descriptive Statistics

The main explanatory variable is ESG rating disagreement. Using the matched firm-year sample described above, we standardize the ESG scores from Bloomberg, Huazheng, and Wind separately by year within the sample jointly covered by all three providers. The standardized scores are then used to construct firm-year measures of ESG rating disagreement and average ESG scores. Once constructed, these variables are kept fixed and are not recalculated after subsequent sample restrictions based on continuous rating coverage, firm type, or the availability of regression variables. This prevents changes in the final regression sample from mechanically altering the measurement of ESG rating disagreement.

Let R_{ijt} denote the raw ESG score assigned by provider j to firm i in year t. The scores of each provider are standardized annually within the sample jointly covered by all three providers:

$$Z_{ijt} = \frac{R_{ijt} - \bar{R}_{jt}}{S_{jt}} \tag{1}$$

where $\bar{R}_{jt}$ and S_{jt} are the mean and standard deviation, respectively, of the ESG scores assigned by provider j among firms with scores available from all three providers in year t. Z_{ijt} is the resulting standardized score.

Let $J = 3$ denote the three rating providers. The mean of the three standardized scores for firm i in year t is defined as:

$$\bar{Z}_{it} = \frac{1}{J}\sum_{j=1}^{J} Z_{ijt} \tag{2}$$

The standard deviation of the three standardized scores is used as the main measure of ESG rating disagreement:

$$ESGDis_{it} = \sqrt{\frac{1}{J-1}\sum_{j=1}^{J}\left(Z_{ijt} - \bar{Z}_{it}\right)^2} \tag{3}$$

This dispersion-based construction is consistent with recent studies that measure ESG rating disagreement using the standard deviation of ratings across multiple providers (e.g., Lou et al., 2025).

A higher $ESGDis_{it}$ indicates greater divergence across rating providers in their firm-level ESG assessments. To examine whether the results depend on a particular mathematical construction, two alternative measures of rating disagreement are also used: the range and the mean absolute deviation (MAD):

$$ESGRange_{it} = \max_j\left(Z_{ijt}\right) - \min_j\left(Z_{ijt}\right) \tag{4}$$

and

$$ESGMAD_{it} = \frac{1}{J}\sum_{j=1}^{J}\left|Z_{ijt} - \bar{Z}_{it}\right| \tag{5}$$

These measures capture cross-provider dispersion within the same firm-year using different mathematical constructions, allowing us to assess whether the results are sensitive to the measurement of ESG rating disagreement.

The mean of the three standardized scores is used to capture the firm's overall ESG

assessment. After $\bar{Z}_{it}$ is calculated using Equation (2), it is standardized again by year to obtain the ESG mean score ($ESG\ Mean$):

$$ESGMean_{it} = \frac{\bar{Z}_{it} - \overline{\bar{Z}}_t}{S_{\bar{Z},t}} \quad (6)$$

where $\overline{\bar{Z}}_t$ and $S_{\bar{Z},t}$ are the mean and standard deviation, respectively, of the firm-level average score $\bar{Z}_{it}$ in year t. $ESG\ Mean$ is included together with ESG rating disagreement in the regression models to distinguish the firm's overall ESG assessment from differences in assessments across rating providers.

The same standardization and construction procedures are applied separately to the environmental (E), social (S), and governance (G) dimensions to obtain dimension-specific disagreement and mean-score measures.

The study uses three measures of firm value. The primary dependent variable is the natural logarithm of the price-to-book ratio,$ln(PB)$. $Tobin's\ Q$ and the natural logarithm of market capitalization, $ln(Mkt\ Cap)$, are used as alternative dependent variables to examine whether the results are sensitive to the measurement of firm value. $Tobin's\ Q$ captures a firm's market valuation relative to its asset base, while $ln(Mkt\ Cap)$ is the natural logarithm of the firm's market value. These measures allow us to assess whether the results are sensitive to alternative measures of firm value.

$Analyst\ Attention$ is the mediating variable and is measured by the number of analysts following a firm in a given year. State ownership (SOE) and stock turnover ($Turnover$) are used to examine the boundary conditions of the analyst attention channel. SOE is a dummy variable equal to one for state-owned enterprises and zero otherwise. $Turnover$ is measured as the natural logarithm of the one-year-lagged stock turnover rate and is standardized within each year to capture a firm's trading activity relative to the annual cross-sectional distribution. The one-year lag is used to reduce concerns that contemporaneous turnover may be jointly determined with analyst attention or firm valuation.

The control variables include firm size ($Size$), profitability (ROA), leverage (Lev), cash holdings ($Cash$), sales growth ($Growth$), and institutional ownership ($InstOwn$). The aggregate ESG models control for $ESG\ Mean$, while the E-, S-, and G-dimension models control for the corresponding dimension-specific mean scores. $ln(PB)$, $Tobin's\ Q$, $ln(Mkt\ Cap)$, and $Growth$ are winsorized at the 1st and 99th percentiles. Table 1 provides the definitions, measurement, and data treatment of all variables.

Table 2 reports the descriptive statistics for the main variables, and Table 3 presents the pairwise correlations. The mean VIF is 1.42 and the maximum VIF is 1.95, indicating that multicollinearity is not a serious concern.

Table 1. Definitions and measurements of firm-level variables

Name	Symbol	Measurement	Processing
Dependent Variables			
Log Price-to-Book Ratio	*ln(PB)*	Natural logarithm of the price-to-book ratio.	Winsorized at the 1st and 99th percentiles
Tobin's Q	*Tobin's Q*	Market capitalization A (following the CSMAR definition) divided by total assets.	Winsorized at the 1st and 99th percentiles
Log Market Capitalization	*ln(Mkt Cap)*	Natural logarithm of market capitalization.	Winsorized at the 1st and 99th percentiles
Mediating Variable			
Analyst Attention	*Analyst*	Number of analysts following the firm in a given year.	——
Moderating Variables			
State Ownership	*SOE*	A dummy variable equal to 1 for state-owned enterprises and 0 otherwise.	——
Log Turnover Rate	*Turnover*	Natural logarithm of the one-year-lagged stock turnover rate.	Standardized annually
Control Variables			
Firm Size	*Size*	Natural logarithm of total assets.	——
Leverage	*Lev*	Total liabilities divided by total assets.	——
Profitability	*ROA*	Net income divided by total assets.	——
Cash Holdings	*Cash*	Cash and cash equivalents divided by total assets.	——
Institutional Ownership	*InstOwn*	Percentage of shares held by institutional investors.	——
Revenue Growth	*Growth*	Annual change in operating revenue divided by operating revenue in year $t-1$.	Winsorized at the 1st and 99th percentiles

Table 2. Descriptive statistics for all variables

Variables	Obs.	Mean	Std.Dev.	Min	Median	Max
ln(PB)	6238	0.624	0.821	-1.169	0.544	2.853
Tobin's Q	6251	1.809	1.369	0.768	1.336	8.952
ln(Mkt Cap)	6251	24.023	1.114	21.791	23.950	27.365
ESG Rating Disagreement	6251	0.610	0.356	0.009	0.549	2.803
ESG Mean	6251	-0.012	0.950	-3.066	-0.120	4.038
Analyst	6251	10.996	13.343	0	5	75
SOE	6251	0.522	0.500	0	1	1
Turnover	6242	0.000	1.000	-5.822	0.011	3.025
Size	6250	23.600	1.253	20.329	23.514	28.791
ROA	6251	0.038	0.078	-1.780	0.035	0.835
Lev	6251	0.479	0.201	0.014	0.488	1.484
Cash	6251	0.143	0.104	0.003	0.116	0.731
Growth	6251	0.101	0.289	-0.532	0.069	1.521
InstOwn	6251	50.932	21.359	0.002	53.17	100

Table 3. Correlation matrix for main variables

Variables	*ln(PB)*	*ESG Rating Disagreement*	*ESG mean*	*Analyst Attention*	*SOE*	*Turnover*	*Size*	*ROA*	*Lev*	*Cash*	*Growth*	*InstOwn*
ln(PB)	1.000											
ESG Rating Disagreement	0.058	1.000										
ESG Mean	0.008	0.150	1.000									
Analyst Attention	0.392	0.093	0.358	1.000								
SOE	-0.270	-0.036	0.012	-0.213	1.000							
Turnover	0.250	0.019	-0.169	-0.038	-0.149	1.000						
Size	-0.444	0.027	0.334	0.237	0.193	-0.394	1.000					
ROA	0.191	0.039	0.179	0.388	-0.112	-0.061	0.022	1.000				
Lev	-0.203	0.008	-0.080	-0.130	0.189	-0.054	0.425	-0.387	1.000			
Cash	0.243	0.023	0.107	0.185	-0.016	0.039	-0.162	0.246	-0.348	1.000		
Growth	0.183	0.070	0.058	0.192	-0.066	0.040	0.040	0.273	-0.017	-0.031	1.000	
InstOwn	-0.176	0.031	0.152	0.111	0.376	-0.470	0.421	0.111	0.149	0.030	0.019	1.000

4.3 Empirical Strategy

We first estimate the relationship between ESG rating disagreement and firm value using the following baseline model:

$$FirmValue_{it} = \beta_0 + \beta_1 ESGDis_{it} + \beta_2 ESGMean_{it} + \gamma Controls_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (7)$$

where $FirmValue_{it}$ denotes the value of firm i in year t. The main measure is $ln(PB)$, while $Tobin's\ Q$ and $ln(Mkt\ Cap)$ are used as alternative measures. $ESGDis_{it}$ denotes ESG rating disagreement, $ESGMean_{it}$ is the corresponding average score, and $Controls_{it}$ represents the firm-level control variables. All regression models include firm and year fixed effects, with standard errors clustered at the firm level. The coefficient β_1 captures the relationship between ESG rating disagreement and firm value after controlling for the overall level of ESG evaluation.

To examine the intermediary role of analyst attention in the relationship between ESG rating disagreement and firm value, we estimate the following models:

$$Analyst_{it} = \alpha_0 + \alpha_1 ESGDis_{it} + \alpha_2 ESGMean_{it} + \gamma Controls_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (8)$$

$$FirmValue_{it} = \delta_0 + \delta_1 ESGDis_{it} + \delta_2 Analyst_{it} + \delta_3 ESGMean_{it} + \gamma Controls_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (9)$$

Equation (8) examines the relationship between ESG rating disagreement and analyst attention, while Equation (9) includes both ESG rating disagreement and analyst attention. The indirect effect is measured by $\alpha_1 \times \delta_2$. We use 5,000 bootstrap replications to estimate the indirect effect and its 95% confidence interval, with resampling clustered at the firm level. This procedure avoids relying on a normal approximation for the indirect effect.

To examine whether the analyst attention channel differs across ESG dimensions, we replace aggregate ESG rating disagreement with disagreement in the environmental (E), social (S), and governance (G) dimensions and control for the corresponding average score in each model. The same specifications as in Equations (8) and (9) and the same bootstrap procedure are applied to each dimension, allowing the indirect effects to be estimated separately across the E, S, and G dimensions. Formal bootstrap comparisons are then used to assess differences in the estimated indirect effects across dimensions.

Following the dimension-specific analysis, the boundary-condition tests focus on the social dimension, for which the analyst attention channel exhibits the clearest empirical pattern. Ownership structure is represented by SOE, an indicator for state-owned firms, and is used primarily to examine whether the association between rating disagreement and analyst attention varies by ownership type. Stock trading activity is represented by $Turnover$, measured as the annually standardized one-year-lagged log turnover rate, and is used primarily to examine whether the association between analyst

attention and firm value varies with prior trading activity. The regression models report both the interaction between rating disagreement and the moderator and the interaction between $Analyst\ Attention$ and the moderator, thereby allowing for moderation at both stages.

Moderated mediation is examined using 5,000 bootstrap replications, with resampling clustered at the firm level. For SOE, we estimate the conditional indirect effects separately for state-owned and non-state-owned firms. For $Turnover$, the conditional indirect effects are estimated under the hypothesized second-stage moderation specification at low, mean, and high levels, corresponding to one standard deviation below the mean, the mean, and one standard deviation above the mean, respectively. The index of moderated mediation and its bias-corrected 95% bootstrap confidence interval are used to assess whether the indirect effect varies with the moderator.

5. Empirical Results

5.1 Baseline Results

Table 4 reports the baseline regression results for the relationship between ESG rating disagreement and firm value. All models include firm and year fixed effects, with standard errors clustered at the firm level.

In Model 1, the coefficient on ESG rating disagreement is 0.0498 and statistically significant at the 1% level, indicating a positive association with price-to-book valuation after controlling for the overall level of ESG evaluation and other firm characteristics. Given the standard deviation of ESG rating disagreement of 0.356, a one-standard-deviation increase in disagreement is associated with an approximately 1.8% higher price-to-book ratio, indicating that the magnitude of the association is economically modest. In Models 2 and 3, the coefficients on ESG rating disagreement remain positive at 0.0633 for $Tobin's\ Q$ ($p < 0.10$) and 0.0317 for $ln(Mkt\ Cap)$ ($p < 0.01$), respectively. The evidence is therefore directionally consistent across the three valuation measures, although the $Tobin's\ Q$ estimate is statistically weaker.

Models 4 and 5 further replace the standard deviation measure of disagreement with ESG rating range and ESG rating MAD. When $ln(PB)$ is used as the dependent variable, the estimated coefficient is 0.0260 for ESG rating range and 0.0672 for ESG rating MAD, both of which are significant at the 1% level. These results suggest that the positive association is robust to alternative measures of ESG rating disagreement.[2]

Table 4. Baseline regression results

Model	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
Variables	*ln(PB)*	*Tobin's Q*	*ln(Mkt Cap)*	*ln(PB)*	*ln(PB)*

[2] As additional checks, we account for nonlinear effects of average ESG ratings and control separately for individual providers' standardized scores. ESG rating disagreement remains positively and significantly associated with firm value in both specifications ($\beta = 0.0480$, $p = 0.004$; $\beta = 0.0378$, $p = 0.027$, respectively).

ESG Rating Disagreement	0.0498***	0.0633*	0.0317***		
	(0.0163)	(0.0341)	(0.0113)		
ESG Rating Range				0.0260***	
				(0.0084)	
ESG Rating MAD					0.0672***
					(0.0240)
ESG Mean	-0.0164	-0.0030	0.0052	-0.0164	-0.0165
	(0.0104)	(0.0211)	(0.0071)	(0.0104)	(0.0104)
Size	-0.5372***	-0.7002***	0.6955***	-0.5374***	-0.5371***
	(0.0343)	(0.0575)	(0.0190)	(0.0343)	(0.0343)
ROA	0.9415***	1.6735***	0.6493***	0.9413***	0.9417***
	(0.2606)	(0.4415)	(0.1767)	(0.2607)	(0.2605)
Lev	1.7120***	0.9162***	0.3919***	1.7121***	1.7121***
	(0.1333)	(0.2301)	(0.0849)	(0.1334)	(0.1334)
Cash	0.6299***	0.8568***	0.3218***	0.6292***	0.6307***
	(0.1162)	(0.3156)	(0.0926)	(0.1162)	(0.1162)
Growth	0.1965***	0.3063***	0.1069***	0.1964***	0.1966***
	(0.0263)	(0.0509)	(0.0183)	(0.0263)	(0.0263)
InstOwn	0.0099***	0.0141***	0.0055***	0.0099***	0.0099***
	(0.0012)	(0.0026)	(0.0008)	(0.0012)	(0.0012)
Constant	11.5302***	16.4030***	6.8413***	11.5353***	11.5265***
	(0.7848)	(1.3253)	(0.4414)	(0.7851)	(0.7847)
Observations	6237	6250	6250	6237	6237
R-squared	0.3422	0.1936	0.6355	0.3422	0.3422
Firm FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes

Note: Each cell reports the estimated coefficient. Robust standard errors clustered at the firm level are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

5.2 Intermediary Role of Analyst Attention

Table 5 examines the intermediary role of analyst attention in the relationship between ESG rating disagreement and firm value. In Model 6, where $Analyst\ Attention$ is used as the dependent variable, the coefficient on ESG rating

disagreement is 0.8921 and statistically significant at the 1% level, indicating that greater ESG rating disagreement is associated with greater analyst attention. In economic terms, a one-standard-deviation increase in ESG rating disagreement corresponds to about 0.32 additional analysts, a modest change relative to the sample mean of roughly 11 analysts.

Models 7-9 further include $Analyst\ Attention$ in the firm value regressions. $Analyst\ Attention$ is positively associated with all three firm value measures, with coefficients of 0.0195, 0.0349, and 0.0129, all significant at the 1% level. After $Analyst\ Attention$ is included, the coefficients on ESG rating disagreement decline to 0.0323, 0.0320, and 0.0201 for $ln(PB)$, $Tobin's\ Q$, and $ln(Mkt\ Cap)$, respectively, remaining significant for $ln(PB)$ and $ln(Mkt\ Cap)$ but not for $Tobin's\ Q$.

The bootstrap results provide further evidence of an indirect association through $Analyst\ Attention$. Based on 5,000 bootstrap replications, the estimated indirect effects are 0.0174 for $ln(PB)$, 0.0311 for $Tobin's\ Q$, and 0.0115 for $ln(Mkt\ Cap)$, with bias-corrected 95% confidence intervals of [0.0051, 0.0310], [0.0088, 0.0555], and [0.0032, 0.0205], respectively. None of the confidence intervals includes zero. Within the estimated mediation models, the indirect associations correspond to approximately 35.0%, 49.3%, and 36.4% of the total associations across the three firm value measures. These results are consistent with analyst attention serving as an information-intermediation channel linking ESG rating disagreement to firm value.

Table 5. ESG Rating Disagreement, Analyst Attention, and Firm Value

Model	$X \rightarrow M$	$X + M \rightarrow Y$		
	(6)	**(7)**	**(8)**	**(9)**
Variables	*Analyst Attention*	*ln(PB)*	*Tobin's Q*	*ln(Mkt Cap)*
ESG Rating Disagreement	0.8921***	0.0323**	0.0320	0.0201*
	(0.3249)	(0.0150)	(0.0324)	(0.0105)
Analyst Attention	———	0.0195***	0.0349***	0.0129***
		(0.0008)	(0.0028)	(0.0007)
ESG Mean	0.4063*	-0.0244**	-0.0176	-0.0002
	(0.2301)	(0.0097)	(0.0205)	(0.0067)
Size	1.1961**	-0.5606***	-0.7376***	0.6826***
	(0.5515)	(0.0322)	(0.0575)	(0.0183)
ROA	15.4924***	0.6387***	1.2141***	0.4878***
	(2.9938)	(0.2188)	(0.3946)	(0.1616)
Lev	-1.8020	1.7488***	0.9160***	0.3802***
	(1.9846)	(0.1201)	(0.2182)	(0.0772)
Cash	7.4042***	0.4852***	0.5931**	0.2236***
	(2.2308)	(0.1058)	(0.2985)	(0.0852)
Growth	1.8020***	0.1613***	0.2429***	0.0836***

	(0.3659)	(0.0227)	(0.0456)	(0.0162)
InstOwn	0.1973***	0.0061***	0.0073***	0.0030***
	(0.0254)	(0.0010)	(0.0024)	(0.0008)
Constant	-27.1298**	12.0606***	17.2746***	7.1467***
	(12.6380)	(0.7342)	(1.3197)	(0.4249)
Bootstrap test of mediation				
Indirect effect	——	0.0174 (0.0066)	0.0311 (0.0119)	0.0115 (0.0044)
Bias-corrected 95% CI	——	[0.0051, 0.0310]	[0.0088, 0.0555]	[0.0032, 0.0205]
Proportion mediated	——	35.0%	49.3%	36.4%
Observations	6237	6237	6237	6237
R-squared	0.1627	0.4355	0.2621	0.6801
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Note: Firm-clustered robust standard errors are reported in parentheses for the regression coefficients. Bootstrap standard errors for the indirect effects are reported in parentheses. Bias-corrected 95% confidence intervals are based on 5,000 bootstrap replications. The proportion mediated is calculated as the indirect effect divided by the total effect estimated using the same sample. All models include firm and year fixed effects. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

5.3 Dimension-specific Analysis

Table 6 further decomposes aggregate ESG rating disagreement into the environmental (E), social (S), and governance (G) dimensions to examine whether the analyst attention channel varies across ESG dimensions. In Models 10, 11 and 12, the coefficients on E-, S-, and G-dimension rating disagreement are 0.4464, 0.6360, and 0.4530, respectively. The coefficient is statistically significant at the 5% level for the S dimension and at the 10% level for the G dimension, but is not significant for the E dimension. Among the three dimensions, the social dimension provides the clearest first-stage evidence of a positive association with analyst attention. The corresponding total-association estimates, obtained without including $Analyst\ Attention$ in the firm value regressions, are 0.0083 for the environmental dimension, 0.0453 for the social dimension, and 0.0155 for the governance dimension. Only the social-dimension estimate is statistically significant ($p = 0.002$), whereas the environmental and governance estimates are not statistically significant.

Models 13, 14, and 15 further include $Analyst\ Attention$ in the firm value regressions. The coefficients on $Analyst\ Attention$ are positive and statistically significant at the 1% level in all three dimensions. After controlling for $Analyst\ Attention$, the coefficients on E- and G-dimension rating disagreement are

−0.0006 and 0.0064, respectively, and are not statistically significant, whereas the coefficient on S-dimension rating disagreement remains positive and significant at 0.0329. The association between analyst attention and firm value remains relatively stable across the three dimensions.[3]

The bootstrap results provide further evidence on the dimension-specific indirect associations. The estimated indirect effects are 0.0089 for the environmental dimension, 0.0124 for the social dimension, and 0.0091 for the governance dimension, with bias-corrected 95% confidence intervals of [−0.0031, 0.0216], [0.0025, 0.0228], and [−0.0014, 0.0196], respectively, and only the confidence interval for the S dimension excludes zero. However, formal bootstrap comparisons indicate that the social-dimension indirect effect is not statistically larger than the corresponding indirect effects for the environmental and governance dimensions. Within the estimated mediation model, the social-dimension indirect association corresponds to approximately 27.4% of the total association. Since the social dimension provides the clearest empirical evidence of the analyst-attention channel, the subsequent boundary-condition analysis focuses on the social-dimension channel. As a supplementary check, we re-estimate the dimension-specific firm value models using $Tobin's\ Q$ and $ln(Mkt\ Cap)$ as alternative valuation measures. The coefficient on S-dimension rating disagreement remains positive and statistically significant under both measures, whereas the E- and G-dimension coefficients remain statistically insignificant. The association between analyst attention and firm value also remains positive across all three dimensions. Detailed results are reported in Appendix Table B.

[3] When the three dimension-specific disagreement measures are entered jointly, the social-dimension measure remains statistically significant, whereas the environmental and governance measures are not statistically significant.

Table 6. Dimension-Specific ESG Rating Disagreement and the Analyst Attention Channel

Model	**First Stage**			**Second Stage**		
	(10)	**(11)**	**(12)**	**(13)**	**(14)**	**(15)**
Dimension	***E***	***S***	***G***	***E***	***S***	***G***
Dependent Variables	*Analyst Attention*	*Analyst Attention*	*Analyst Attention*	*ln(PB)*	*ln(PB)*	*ln(PB)*
E-Dimension Disagreement	0.4464	____	____	-0.0006	____	____
	(0.3282)			(0.0140)		
S-Dimension Disagreement	____	0.6360**	____	____	0.0329**	____
		(0.2635)			(0.0128)	
G-Dimension Disagreement	____	____	0.4530*	____	____	0.0064
			(0.2729)			(0.0144)
Corresponding Mean Rating	0.0495	0.6563***	-0.0318	-0.0065	-0.0002	-0.0190**
	(0.2037)	(0.2076)	(0.1885)	(0.0093)	(0.0083)	(0.0082)
Analyst Attention	____	____	____	0.0196***	0.0195***	0.0195***
				(0.0009)	(0.0009)	(0.0009)
Size	1.2764**	1.0919**	1.3424**	-0.5731***	-0.5748***	-0.5662***
	(0.5457)	(0.5432)	(0.5499)	(0.0325)	(0.0324)	(0.0323)
ROA	14.6266***	14.7099***	14.4281***	0.6539***	0.6529***	0.6421***
	(2.8602)	(2.8689)	(2.8258)	(0.2201)	(0.2198)	(0.2191)
Lev	-1.1242	-0.8298	-1.2971	1.7707***	1.7729***	1.7525***
	(1.8915)	(1.8762)	(1.8870)	(0.1206)	(0.1209)	(0.1201)

Cash	7.6122***	7.3184***	7.6284***	0.4787***	0.4746***	0.4865***
	(2.2336)	(2.2322)	(2.2286)	(0.1065)	(0.1060)	(0.1059)
Growth	1.7760***	1.8119***	1.7492***	0.1645***	0.1653***	0.1631***
	(0.3592)	(0.3606)	(0.3617)	(0.0230)	(0.0228)	(0.0227)
InstOwn	0.1993***	0.1974***	0.1993***	0.0061***	0.0061***	0.0061***
	(0.0255)	(0.0253)	(0.0255)	(0.0011)	(0.0010)	(0.0010)
Constant	-29.1299**	-25.0136**	-30.6178**	12.3630***	12.3787***	12.2051***
	(12.5343)	(12.4806)	(12.5859)	(0.7419)	(0.7384)	(0.7335)
Bootstrap test of mediation						
Indirect effect (Bootstrap SE)	____	____	____	0.0089 (0.0064)	0.0124 (0.0052)	0.0091 (0.0054)
Bias-corrected 95% CI	____	____	____	[-0.0031, 0.0216]	[0.0025, 0.0228]	[-0.0014, 0.0196]
Observations	6237	6237	6237	6237	6237	6237
R-squared	0.1594	0.1637	0.1595	0.4338	0.4346	0.4348
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Note: Firm-clustered robust standard errors are reported in parentheses for the regression coefficients. The bootstrap panel reports the indirect effects through analyst attention, with bootstrap standard errors in parentheses and bias-corrected 95% confidence intervals based on 5,000 bootstrap replications. All models include firm and year fixed effects. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

5.4 Boundary Conditions

Table 7 examines the boundary conditions of the social-dimension analyst-attention channel, focusing on state ownership and stock trading activity.

Models 16 and 17 examine the moderating role of state ownership. In the first-stage model, the interaction between S-dimension rating disagreement and SOE is negative and statistically significant (−1.7242, $p < 0.01$), indicating that the positive association between S-dimension disagreement and analyst attention is weaker among state-owned enterprises. By contrast, neither the interaction between S-dimension disagreement and SOE nor the interaction between analyst attention and SOE is statistically significant in the second-stage model. These results indicate that the ownership-related heterogeneity is concentrated primarily in the first stage of the analyst-attention channel, consistent with H4.

The conditional indirect associations provide further evidence of this pattern. The estimated indirect association is 0.0301 for non-SOEs, with a bias-corrected 95% confidence interval of [0.0130, 0.0484], whereas the corresponding estimate for SOEs is −0.0028, with a confidence interval of [−0.0140, 0.0083]. The index of moderated mediation is −0.0329, with a bias-corrected 95% confidence interval of [−0.0540, −0.0122], indicating that the indirect association is significantly weaker among SOEs.

Models 18 and 19 examine the moderating role of stock trading activity using the annually standardized one-year-lagged log turnover rate. The interaction between S-dimension disagreement and lagged relative turnover is not statistically significant in either stage. By contrast, the interaction between $Analyst\ Attention$ and lagged relative turnover is negative and statistically significant (−0.0013), indicating that the positive association between $Analyst\ Attention$ and firm value becomes weaker as prior trading activity increases. These results suggest that evidence of turnover-related moderation is concentrated primarily in the second stage of the analyst-attention channel, consistent with H5.

The conditional indirect effects at low, mean, and high levels of lagged relative turnover are 0.0113, 0.0106, and 0.0098, respectively, and all corresponding 95% confidence intervals exclude zero. The index of moderated mediation is −0.0007, with a bias-corrected 95% confidence interval of [−0.0021, −0.0001], indicating that the indirect association decreases as prior trading activity increases. The decline from low to high turnover is approximately 13%, indicating that the economic magnitude of this moderation is modest.

Table 7. Boundary Conditions of the S-Dimension Analyst Attention Channel

Moderating Variables	***SOE***		***Lagged Relative Turnover***	
Model	**First Stage (16)**	**Second Stage (17)**	**First Stage (18)**	**Second Stage (19)**
Dependent Variables	*Analyst Attention*	*ln(PB)*	*Analyst Attention*	*ln(PB)*
S-Dimension	1.5657***	0.0531***	0.5699**	0.0303**

Disagreement	(0.4533)	(0.0203)	(0.2645)	(0.0126)
Analyst Attention	____	0.0202*** (0.0011)	____	0.0188*** (0.0008)
SOE	0.9901 (1.0555)	0.0583 (0.0643)	____	____
*S-Dimension Disagreement *SOE*	-1.7242*** (0.5369)	-0.0390 (0.0258)	____	____
*Analyst Attention*SOE*	____	-0.0024 (0.0015)	____	____
Lagged Relative Turnover	____	____	1.0213*** (0.1997)	0.0808*** (0.0108)
*S-Disagreement *Lagged Relative Turnover*	____	____	0.1130 (0.1997)	-0.0119 (0.0103)
*Analyst Attention *Lagged Relative Turnover*	____	____	____	-0.0013** (0.0006)
Corresponding Mean Rating	0.6245*** (0.2077)	-0.0011 (0.0084)	0.7087*** (0.2069)	0.0048 (0.0082)
Size	1.1478** (0.5407)	-0.5729*** (0.0328)	1.5627*** (0.5435)	-0.5509*** (0.0328)
ROA	14.6456*** (2.8570)	0.6470*** (0.2196)	13.5443*** (2.7196)	0.5403*** (0.2074)
Lev	-0.7079 (1.8752)	1.7768*** (0.1216)	-1.5146 (1.8361)	1.7446*** (0.1196)
Cash	7.5788*** (2.2308)	0.4804*** (0.1061)	6.2644*** (2.2231)	0.4306*** (0.1037)
Growth	1.7779*** (0.3599)	0.1643*** (0.0228)	1.8110*** (0.3525)	0.1691*** (0.0223)
InstOwn	0.1957*** (0.0252)	0.0060*** (0.0011)	0.2086*** (0.0254)	0.0069*** (0.0010)
Constant	-28.8532** (12.5050)	12.3089*** (0.7526)	-35.9754*** (12.4753)	11.8103*** (0.7416)
Bootstrap test of moderated mediation				
Conditional indirect effect: Non-SOE	0.0301 (0.0090)		____	
Bias-corrected 95% CI	[0.0130, 0.0484]		____	

Conditional indirect effect: SOE	-0.0028 (0.0056)		——	
Bias-corrected 95% CI	[-0.0140, 0.0083]		——	
Index of moderated mediation	-0.0329 (0.0106)		——	
Bias-corrected 95% CI	[-0.0540, -0.0122]		——	
Conditional indirect effect: Low turnover	——		0.0113 (0.0055)	
Bias-corrected 95% CI	——		[0.0010, 0.0220]	
Conditional indirect effect: Mean turnover	——		0.0106 (0.0050)	
Bias-corrected 95% CI	——		[0.0009, 0.0204]	
Conditional indirect effect: High turnover	——		0.0098 (0.0046)	
Bias-corrected 95% CI	——		[0.0009, 0.0191]	
Index of moderated mediation	——		-0.0007 (0.0008)	
Bias-corrected 95% CI	——		[-0.0021, -0.0001]	
Observations	6237	6237	6241	6228
R-squared	0.1660	0.4355	0.1767	0.4482
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Note: Firm-clustered robust standard errors are reported in parentheses for the regression coefficients. The bootstrap panel reports conditional indirect effects and indices of moderated mediation, with bootstrap standard errors in parentheses and bias-corrected 95% confidence intervals based on 5,000 bootstrap replications. Low, mean, and high turnover correspond to one standard deviation below the mean, the mean, and one standard deviation above the mean, respectively. All models include firm and year fixed effects. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

5.5 Temporal Robustness

To address concerns arising from the contemporaneous measurement of rating disagreement, analyst attention, and firm value, we re-estimate the models using one-year-lagged rating disagreement and the corresponding lagged mean rating.

For aggregate ESG rating disagreement, lagged disagreement remains positively associated with $Analyst\ Attention$ (0.8200, $p < 0.05$), while its total association with

firm value is positive but statistically insignificant (0.0224). After $Analyst\ Attention$ is included, the coefficient on lagged disagreement decreases to 0.0055, whereas $Analyst\ Attention$ remains positively and significantly associated with firm value. The S-dimension results exhibit a similar temporal pattern: lagged S-dimension disagreement remains positively associated with $Analyst\ Attention$ (0.6292, p = 0.021), while its total association with firm value is positive and marginally significant (0.0252, p = 0.054) and becomes statistically insignificant after $Analyst\ Attention$ is included. Bootstrap analysis further shows significant indirect associations for both aggregate ESG disagreement (0.0170, BC 95% CI [0.0035, 0.0308]) and S-dimension disagreement (0.0131, BC 95% CI [0.0018, 0.0245]). These results suggest that the indirect association through analyst attention is not confined to contemporaneous specifications.

As a more stringent temporal check, we further estimate a staggered specification using ESG rating disagreement at $t-2$, analyst attention at $t-1$, and firm value at t. The first-stage association remains positive and statistically significant, while analyst attention remains positively associated with firm value in the second stage. The overall valuation association attenuates, particularly for the S dimension. Detailed results are reported in Appendix Table C.

Table 8. One-Year-Lagged Specifications for the Analyst-Attention Channel

Dimension	**Aggregate ESG Rating Disagreement**			**S-Dimension Rating Disagreement**		
Model	**(20)**	**(21)**	**(22)**	**(23)**	**(24)**	**(25)**
Specification	***Total Association***	***First Stage***	***Second Stage***	***Total Association***	***First Stage***	***Second Stage***
Dependent Variables	*ln(PB)*	*Analyst Attention*	*ln(PB)*	*ln(PB)*	*Analyst Attention*	*ln(PB)*
Lagged Rating Disagreement	0.0224 (0.0166)	0.8200** (0.3277)	0.0055 (0.0147)	0.0252* (0.0131)	0.6292** (0.2714)	0.0120 (0.0114)
Analyst Attention			0.0207*** (0.0009)			0.0208*** (0.0010)
Lagged Mean Rating	-0.0590*** (0.0112)	-0.4698** (0.2286)	-0.0493*** (0.0099)	-0.0252*** (0.0094)	-0.1305 (0.2112)	-0.0225*** (0.0082)
Size	-0.6481*** (0.0409)	0.3116 (0.6284)	-0.6546*** (0.0375)	-0.6779*** (0.0415)	0.1152 (0.6312)	-0.6803*** (0.0381)
ROA	0.8012*** (0.2482)	12.0543*** (2.8669)	0.5519*** (0.2057)	0.8324*** (0.2508)	12.3925*** (2.8966)	0.5742*** (0.2073)
Lev	1.7705*** (0.1362)	-3.4845* (2.0102)	1.8426*** (0.1224)	1.7958*** (0.1379)	-3.2809 (2.0354)	1.8641*** (0.1239)
Cash	0.5567*** (0.1209)	7.0733*** (2.2916)	0.4104*** (0.1099)	0.5547*** (0.1216)	6.9965*** (2.3074)	0.4089*** (0.1100)

Growth	0.1921***	1.5485***	0.1600***	0.1954***	1.6018***	0.1620***
	(0.0263)	(0.3646)	(0.0228)	(0.0265)	(0.3631)	(0.0230)
InstOwn	0.0112***	0.2161***	0.0067***	0.0113***	0.2169***	0.0068***
	(0.0013)	(0.0276)	(0.0011)	(0.0014)	(0.0277)	(0.0011)
Constant	14.2912***	-6.0253	14.4158***	14.7312***	-1.4806	14.7620***
	(0.9462)	(14.3509)	(0.8660)	(0.9578)	(14.4352)	(0.8763)
Observations	5344	5344	5344	5344	5344	5344
R-squared	0.3819	0.1613	0.4754	0.3767	0.1594	0.4719
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Note: Firm-clustered robust standard errors are reported in parentheses. Corresponding Mean Rating refers to the mean rating for the ESG dimension indicated in each column. All models include firm and year fixed effects. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

6. Discussion

6.1 Overall Analyst Attention Channel

This study finds that ESG rating disagreement is significantly and positively associated with analyst attention, and that there is a significant indirect association between ESG rating disagreement and firm value through analyst attention. This pattern suggests that rating disagreement may be accompanied by greater demand for information acquisition and interpretation. This interpretation is broadly consistent with recent studies on the information effects of ESG rating disagreement, which show that disagreement is associated with greater analyst attention, research report production, and information-search activities, as well as more favorable capital market outcomes in certain contexts (Cai et al., 2026; Guo et al., 2026; Li & Chen, 2025).

The results further indicate that this information-processing response is relevant to firm valuation. Inconsistency across rating agencies may make firm-level ESG information more difficult to interpret, creating greater scope for professional information intermediaries to collect, compare, and integrate information from different sources.

Recent research has also begun to examine ESG rating disagreement in relation to analyst attention and firm valuation in China (Zhu et al., 2026). Our study complements this emerging literature by examining analyst attention as an information-intermediation channel linking rating disagreement to firm value, while further considering dimension-specific patterns and stage-specific boundary conditions. The indirect association also remains statistically significant when rating disagreement is lagged by one year, while the stricter staggered specification provides weaker evidence for the overall valuation association, particularly in the social dimension. These temporal checks reduce concerns that the baseline pattern is driven solely by contemporaneous measurement, although they do not establish a causal relationship.

6.2 Dimension-Specific Analyst Attention Channel

The dimension-specific analysis shows that the social dimension provides the clearest empirical evidence for the analyst-attention channel proposed in this study. However, the formal bootstrap comparisons do not reveal statistically significant differences across dimensions. This motivates further consideration of why social-dimension rating disagreement more clearly exhibits an empirical pattern associated with analyst attention and firm value.

One possible explanation lies in the nature and construction of social-rating information. The social dimension covers a broad range of stakeholder-related issues, including employee relations, human rights, health and safety, product responsibility, supply chains, and community engagement. Assessing these issues often requires the integration of information from different sources and in different forms, and many of them rely on qualitative, policy-based, or activity-based evaluations, while directly comparable outcome measures remain relatively limited. At the same time, rating providers may differ in the social issues they cover, the indicators they employ, and the specific ways in which those issues are measured. Berg et al. (2022) show that ESG

rating disagreement arises to a considerable extent from differences in scope and measurement, while OECD (2025) further documents substantial variation across ESG rating products in the coverage and measurement of social issues, particularly in areas such as human rights and supply chains, where qualitative and policy-based assessments remain prominent. Social-dimension rating disagreement may therefore reflect differences in both assessments of firms' underlying social performance and the information scope and evaluative frameworks on which those assessments are based.

From an information-intermediation perspective, this type of disagreement may leave greater room for professional interpretation. When rating providers differ in their assessments of employee, human-rights, consumer, supply-chain, or community-related issues, comparing final ratings alone may provide limited insight into whether the divergence stems from underlying firm performance, differences in information coverage, or differences in evaluation methods. As professional information intermediaries, analysts can draw on corporate disclosures and other external information to compare and integrate signals from different sources, and may therefore play a greater role in interpreting such disagreement. The breadth of social-rating information, together with heterogeneity in information scope and evaluative frameworks, may help explain why the social dimension exhibits the clearest empirical pattern in the information-intermediation process.

6.3 Boundary Conditions of the Analyst Attention Channel

Further analysis shows that the social-dimension analyst-attention channel varies across firms and market environments. With respect to ownership structure, the difference is concentrated mainly in the first-stage relationship between rating disagreement and analyst attention. The positive association between social-dimension rating disagreement and analyst attention is more pronounced among non-state-owned enterprises than among state-owned enterprises. The conditional indirect effects exhibit a similar pattern, with the estimated indirect association being significantly weaker among state-owned enterprises.

This ownership-related pattern may reflect differences in firms' information environments and in the ways market participants obtain firm-specific information. Compared with non-state-owned enterprises, state-owned enterprises may operate within stronger institutional networks, while assessments of their risks and value may also rely more heavily on institutional background and alternative information sources. Under such conditions, disagreement across rating providers in the social dimension may be less likely to generate the same degree of additional information-search demand. By contrast, non-state-owned enterprises may rely more heavily on market-based information intermediaries. When rating providers offer inconsistent assessments of employee, consumer, supply-chain, or other stakeholder-related issues, professional analysts may therefore have greater scope for information integration and interpretation. Existing studies also suggest that ownership-related information environments matter for ESG rating disagreement and its market implications, with particularly pronounced patterns among non-state-owned enterprises (Cai et al., 2026; Guo et al., 2026; Liu &

Yang, 2026). Our findings are broadly consistent with this logic and further suggest that ownership differences are reflected primarily in whether rating disagreement is accompanied by additional analyst attention.

For stock trading activity, significant moderation appears only in the second-stage relationship between analyst attention and firm value. The negative interaction between analyst attention and trading activity indicates that the positive association between analyst attention and firm value weakens as stock trading becomes more active. Correspondingly, the conditional indirect association through analyst attention also declines as trading activity increases. Although this decline is statistically detectable, the change from low to high turnover is approximately 13%, suggesting that the economic magnitude of the moderation is relatively modest. One possible explanation is that, in more actively traded stocks, firm-related information may enter the market more frequently through investor trading and price adjustment, reducing the marginal value of additional analyst information. In less actively traded firms, by contrast, the interpretive and integrative role of professional analysts may have greater incremental value. Ownership structure appears to matter more for whether rating disagreement is accompanied by additional analyst attention, whereas stock trading activity mainly conditions the strength of the association between analyst attention and firm value. This suggests that different stages of the analyst-attention channel may be associated with different firm-level and market-level conditions.

7. Conclusion

This study examines Chinese A-share listed firms from 2018 to 2024 and investigates the relationships among ESG rating disagreement, analyst attention, and firm value using ratings from Bloomberg, Huazheng, and Wind. The results show that greater ESG rating disagreement is significantly associated with higher firm value and greater analyst attention, with a significant indirect association through analyst attention. The dimension-specific analysis provides the clearest empirical evidence for the social dimension, although formal bootstrap comparisons do not indicate statistically significant differences in indirect associations across dimensions. The boundary-condition analysis further shows that ownership structure and stock trading activity are associated with different stages of the analyst-attention channel: ownership-related heterogeneity is concentrated mainly in the relationship between social-dimension rating disagreement and analyst attention, whereas evidence of turnover-related moderation is concentrated mainly in the association between analyst attention and firm value.

These findings contribute to the emerging literature linking ESG rating disagreement, analyst information intermediation, and firm valuation by identifying dimension-specific patterns and stage-specific boundary conditions in this relationship. They also suggest that the capital market relevance of rating disagreement varies with the nature of the underlying information and the environment in which that information is interpreted and processed by market participants. The dimension-specific and

boundary-condition results further indicate that the economic relevance of ESG rating disagreement may vary across information dimensions, firm characteristics, and market conditions. From a practical perspective, the findings suggest value in improving the clarity, comparability, and verifiability of ESG disclosures, which may facilitate the interpretation of differences across rating providers. Rating providers may likewise benefit from greater transparency in their evaluation frameworks and methodologies in order to reduce the interpretation costs faced by external users. For investors, divergent assessments across rating providers may warrant consideration alongside analyst research and other publicly available information to better identify and interpret the information underlying rating differences.

This study is subject to several limitations. Although the lagged and staggered specifications strengthen the temporal ordering of the analysis, the observational research design does not establish causal relationships. In addition, the measure of rating disagreement is constructed using ratings from three providers, and future research could examine whether the findings extend to a broader set of rating systems. The balanced-panel requirement may favor firms with more consistent ESG rating coverage and may limit the generalizability of the findings to firms with less consistent rating coverage. Analyst attention is measured by the number of analysts following a firm and therefore does not directly reveal the specific ESG information processed by analysts. Future research could combine analyst reports, earnings conference call transcripts, or more granular ESG rating data to examine more directly how analysts interpret divergent ESG assessments and which specific social issues are most closely associated with the dimension-specific empirical pattern documented in this study.

Declaration of generative AI and AI-assisted technologies in the manuscript preparation process

During the preparation of this work, the authors used ChatGPT for language editing and phrasing refinement. After using this tool, the authors reviewed and edited the manuscript as needed and take full responsibility for the content of the published article.

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Appendix A. Sample Construction and Analytical Use

Stage	Sample Construction	Firms remaining	Analytical use
Provider-specific ESG rating universe	ESG rating observations obtained separately from Bloomberg, Huazheng, and Wind	Varies by provider and year	Initial data source for three-provider matching
Initial three-provider matched sample	Retain firm-year observations for which ratings from Bloomberg, Huazheng, and Wind are jointly available	1,007 unique firms; annual sample size varies	Annual standardization and construction of firm-year ESG disagreement and mean-rating variables
Continuous three-provider sample	Require continuous three-provider coverage throughout 2018–2024	984 firms	Construction of the balanced ESG disagreement and mean-rating panel
Exclusion of financial and ST/*ST firms	Exclude financial firms and firms designated as ST or *ST during the sample period	895 firms	Sample screening
Missing-value screening	Exclude firms with substantial missing values in key variables	893 firms	Final empirical sample

Appendix B. Alternative Firm Value Measures in Dimension-Specific Firm Value Models

Model	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**
Dimension	***E***	***S***	***G***	***E***	***S***	***G***
Dependent Variables	*Tobin's Q*	*Tobin's Q*	*Tobin's Q*	*ln(Mkt Cap)*	*ln(Mkt Cap)*	*ln(Mkt Cap)*
Rating Disagreement	-0.0048	0.0580**	-0.0102	-0.0027	0.0224**	-0.0013
	(0.0290)	(0.0278)	(0.0283)	(0.0095)	(0.0087)	(0.0092)
Corresponding Mean Rating	-0.0165	0.0134	-0.0293	0.0054	0.0073	-0.0030
	(0.0184)	(0.0176)	(0.0172)	(0.0062)	(0.0057)	(0.0056)
Analyst Attention	0.0350***	0.0347***	0.0349***	0.0130***	0.0129***	0.0130***
	(0.0028)	(0.0027)	(0.0028)	(0.0007)	(0.0007)	(0.0007)
Size	-0.7428***	-0.7428***	-0.7364***	0.6773***	0.6783***	0.6813***
	(0.0556)	(0.0556)	(0.0565)	(0.0180)	(0.0180)	(0.0182)
ROA	1.1695***	1.1767***	1.1565***	0.4635***	0.4639***	0.4605***
	(0.3753)	(0.3754)	(0.3768)	(0.1529)	(0.1529)	(0.1533)
Lev	0.9572***	0.9506***	0.9370***	0.4083***	0.4087***	0.4029***
	(0.2087)	(0.2102)	(0.2112)	(0.0755)	(0.0756)	(0.0762)
Cash	0.5908**	0.5800**	0.6017**	0.2243***	0.2203***	0.2259***
	(0.2986)	(0.2975)	(0.2991)	(0.0852)	(0.0849)	(0.0853)
Growth	0.2441***	0.2474***	0.2432***	0.0844***	0.0845***	0.0835***
	(0.0458)	(0.0453)	(0.0455)	(0.0162)	(0.0161)	(0.0160)

InstOwn	0.0073***	0.0072***	0.0073***	0.0030***	0.0029***	0.0030***
	(0.0024)	(0.0024)	(0.0024)	(0.0008)	(0.0008)	(0.0008)
Constant	17.4045***	17.5933***	17.2678***	7.2742***	7.2339***	7.1812***
	(1.2828)	(1.2810)	(1.3007)	(0.4195)	(0.4169)	(0.4221)
Observations	6250	6250	6250	6250	6250	6250
R-squared	0.3567	0.3571	0.3557	0.6794	0.6800	0.6794
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Note: Firm-clustered robust standard errors are reported in parentheses. Corresponding Mean Rating refers to the mean rating for the ESG dimension indicated in each column. All models include firm and year fixed effects. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Appendix C. Staggered Temporal Specification for the Analyst-Attention Channel

Dimension	**Aggregate ESG Rating Disagreement**			**S-Dimension Rating Disagreement**		
Model	**C1**	**C2**	**C3**	**C4**	**C5**	**C6**
Specification	***Total Association***	***First Stage***	***Second Stage***	***Total Association***	***First Stage***	***Second Stage***
Dependent Variables	*ln(PB)*	*Analyst Attention*	*ln(PB)*	*ln(PB)*	*Analyst Attention*	*ln(PB)*
Rating Disagreement$_{t-2}$	0.0277*	0.7865**	0.0215	-0.0012	0.5005*	-0.0053
	(0.0168)	(0.3572)	(0.0163)	(0.0148)	(0.2834)	(0.0144)
Analyst Attention$_{t-1}$			0.0080***			0.0083***
			(0.0010)			(0.0010)
Corresponding Mean Rating$_{t-2}$	-0.0626***	-0.7519***	-0.0566***	-0.0490***	-0.3419	-0.0461***
	(0.0118)	(0.2442)	(0.0115)	(0.0106)	(0.2257)	(0.0102)
Size	-0.7909***	2.7456***	-0.8128***	-0.7992***	2.5695***	-0.8204***
	(0.0518)	(0.7500)	(0.0514)	(0.0524)	(0.7508)	(0.0519)
ROA	0.6750***	1.9681	0.6593***	0.7013***	2.3831	0.6816***
	(0.2188)	(1.9002)	(0.2104)	(0.2214)	(1.9355)	(0.2123)
Lev	1.8964***	-5.0669**	1.9368***	1.8966***	-4.9900**	1.9378***
	(0.1467)	(2.4544)	(0.1417)	(0.1464)	(2.4550)	(0.1414)
Cash	0.4825***	3.2199	0.4568***	0.4919***	3.2376	0.4652***
	(0.1336)	(2.2975)	(0.1305)	(0.1343)	(2.3225)	(0.1308)

Growth	0.1944***	-1.3530***	0.2052***	0.1951***	-1.3278***	0.2060***
	(0.0246)	(0.3742)	(0.0246)	(0.0247)	(0.3740)	(0.0246)
InstOwn	0.0118***	0.1255***	0.0108***	0.0120***	0.1274***	0.0110***
	(0.0015)	(0.0277)	(0.0014)	(0.0015)	(0.0276)	(0.0014)
Constant	17.7222***	-56.5543***	18.1736***	17.9233***	-52.2980***	18.3557***
	(1.2125)	(17.0117)	(1.2048)	(1.2264)	(17.0222)	(1.2156)
Observations	4451	4451	4451	4451	4451	4451
R-squared	0.4296	0.1242	0.4438	0.4269	0.1202	0.4422
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Note: Rating Disagreement and the Corresponding Mean Rating are measured at $t-2$, Analyst Attention at $t-1$, $ln(PB)$ and control variables at t. Firm-clustered robust standard errors are reported in parentheses. Corresponding Mean Rating refers to the mean rating for the ESG dimension indicated in each column. All models include firm and year fixed effects. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.