

The Impact of ESG Rating Divergence on Stock Price Synchronicity: Unraveling the Mediating Role of Analyst Dispersion

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Abstract

Based on the sample of A-shared listed companies in China's Shanghai and Shenzhen stock markets from 2018 to 2023, this paper employs data of the ESG rating from five agencies. It empirically explores how divergence in the ESG ratings influences the stock price synchronicity, with analyst dispersion serving as the mediating factors in the relationship. The estimation outcomes reveal that greater divergence across ESG ratings will lead to a significant increase in the stock price synchronicity. As information intermediaries, analysts can effectively alleviate the noise caused by divergent ESG ratings, thus exerting a masking effect. The mechanism test indicates that the reduction in stock turnover is also an essential transmission channel through which divergence of ESG ratings exert an impact on the stock price synchronicity. Heterogeneity analysis shows that information environment and market attention constitute a crucial part in the delivery and transmission of ESG information. The paper highlights the necessity of developing an integrated and standardized ESG rating system. Meanwhile, it is necessary to guide the standardized development of the analyst industry, strengthen its role as an information intermediary in order to enhance the efficiency of the capital market.

Keywords

ESG Divergence; Stock Price Synchronicity; Analyst Dispersion.

1. Introduction

A report called "Who Cares Wins" was jointly released by UNGC and several prominent institutions such as Goldman and Morgan Stanley in 2004. In this report, factors like Environmental, Social and Governance were first proposed as non-financial elements to be included into investment decision-making. Since then, the concept of "ESG" has been officially issued. (As the consensus on sustainability continues to deepen, public attention to ESG performance has surged dramatically). From the perspective of global market practice, (the fast-paced growth of the sustainable investment domain has brought about substantial amounts of) capital inflows into mutual funds which invest based on ESG ratings[1]. As reported in the Global Sustainable Investment review 2024 by the GSIA, the global scale of R&SI assets is projected to hit 16.75 trillion dollars. In light of this background, the data of third-party ESG rating has evolved into an essential reference for investors in assessing corporate ESG performance and identifying potential investment risks.

However, current ESG rating systems have enormous room for improvement. Substantially divergent ESG ratings are often given to identical enterprise across ESG rating institutions[2]. This paper also pointed out that corporate ESG scores released by mainstream international information media showed obvious differences – the average correlation coefficient between agencies was tiny and doesn't converge within times. Regarding China's ESG rating system, Sun

Junxiu evaluated the mainstream Chinese ESG rating, finding that differences lie in data sources, evaluation methodologies, and transparency of rating information disclosure[3]. Wide attention has been paid to the phenomenon of ESG rating divergence, and the origins of such discrepancies have been explored by many scholars. First, there is a lack of unified standardization in the process of evaluation. Such differences can be embodied in variations in the evaluation scope, measurement methods and weight allocation[4]. Localization adaptation differences also lead to variation; for example, domestic agencies include localized Chinese ESG issues such as rural revitalization and poverty alleviation, while international agencies assign lower weights to these localized topics[5]. ESG rating divergence, if it exists, may have an adverse effect on capital market investment decisions. For investors, who lack professional information integration and ESG knowledge interpretation skills, it is difficult to make effective investment decisions when faced with divergent rating results. Incorrect investment decisions often lead to resource misallocation in the capital market. The divergence in ESG ratings greatly reduces their numerical value as a reflection of corporate sustainability performance and their guiding value for the capital market[6]. As a result, divergence among ESG ratings has turned into a key friction when integrating ESG-related information into capital market pricing.

Stock price synchronicity measures the pricing efficiency of capital markets; its level reflects whether firm-specific information is fully incorporated into stock prices or whether prices are instead driven by market-level aggregate factors. As non-financial information, ESG information constitutes an important component of firm-specific information. Using stock price synchronicity as a proxy for market efficiency to examine whether ESG rating divergence affects stock price synchronicity carries strong practical significance. On the one hand, ESG rating divergence may transform ESG information from effective firm-specific information into market noise, leaving investors unable to discern the authenticity and value of firm-specific information. Consequently, investors may rely on market-level information to make investment decisions, preventing firm-specific information from being incorporated into stock prices. On the other hand, ESG rating divergence may serve as a signal of information gaps, stimulating the capital market to actively engage in information discovery, thereby facilitating the incorporation of firm-specific information into stock prices.

At the same time, as important information intermediaries, analysts play a vital part in the capital market. Equipped with abundant financial knowledge and access to high-quality information channels, they provide effective information to the market through professional analyses and interpretations. Studies have shown that capable analysts can overcome market barriers to provide more specific information on firm level[7]. Furthermore, analysts' interpretation and transmission of corporate information contribute incremental value; by excavating, integrating, processing and publicizing firm-specific information, they effectively increase the overall information supply of the capital market[8]. Under this premise, the degree of analyst dispersion directly affects the information transmission efficiency. Specifically, greater analyst dispersion leads to more inconsistent judgements about an enterprise, making it hard for firm-specific information to be integrated into the price, thus pushing up stock price synchronicity[7]. ESG information is a crucial basis for analysts to judge corporate values. For analysts, difficulties of interpreting information are further amplified by the divergence of ESG ratings, leading to analysts' dispersion. Therefore, the main objective of this paper is to investigate how the divergence of ESG rating have effects on the stock price synchronicity and verify the mediating mechanism of analyst dispersion.

The research findings show that the divergence of ESG rating notably enhances the level of stock price synchronicity. Test results from the mediating effect demonstrate that analyst dispersion exerts a significant "masking effect", which means analysts are capable of mitigating the information noise induced by the divergence of ESG ratings. This result suggests that analysts can mitigate information confusion through professional interpretation and

information integration, thereby weakening the rating divergence's positive impact on stock price synchronicity. Simultaneously, ESG rating divergence reduces investor trading intent, thus resulting in a reduction in stock turnover, which drives up stock price synchronicity. Further analysis of heterogeneity reveals that the positive impact of ESG rating divergence on stock price synchronicity differs across different contexts: the impact is more significant in groups with high analyst dispersion and stronger in companies with high ESG performance.

The main contributions of this paper can be outlined as follows: 1. While existing studies have verified the impact of ESG rating divergence and analyst dispersion on stock price synchronicity separately, they haven't integrated the three into a unified analytical framework for chain-style testing. Based on analyst information intermediary theory, this paper verifies the mediating effect of analyst dispersion in order to clarify the functions of analysts in ESG scenarios. 2. Existing research has mostly focused on the level of ESG scores (Prior research has largely centered on the level of ESG scores), information transparency or accounting standards[9,10]. This paper incorporates the divergence ESG rating into the analysis of stock price synchronicity, exploring whether it acts as an information supplement or noise effect. Also, this paper extends the economic outcomes of the divergence of ESG rating and complements the theory that firm-specific information influences stock price synchronicity by integrating the stock turnover factor from the perspective of investor behaviour. 3. This paper conducts heterogeneity analysis on the basis of analyst dispersion degree and ESG performance and discovers that the influence of ESG rating divergence in high-noise information environments and high-ESG-attention firms, providing policy references for optimizing ESG disclosure and rating systems in the last section.

2. Literature Review and Hypothesis Development

2.1. Literature Review

The essence of stock price synchronicity formation is the reflection of the process by which market information is integrated into the stock prices. Its core revolves around two perspectives: information efficiency and irrational noise. In 1998, Roll mentioned that individual stock returns are not heavily influenced by systemic economic and industrial factors; rather, they reflect market- and firm-level information. He argued that high volatility might be related to firm-specific information or "occasional frenzies"[11]. According to the information efficiency, it argues that the level of R^2 reflects how much firm-specific information is incorporated into stock price. Many studies using variables like social media, the number of analysts, institutional regulations and financial transparency have concluded that an increase in firm-specific information gives rise to reduced stock price synchronicity. Morck et al. (2000) confirmed that differences in synchronicity across countries stem from the joint action of property rights protection and corporate information transparency[12]. In markets with low transparency, external investors rely on market or industry average returns to infer a company's value due to the difficulty in the acquisition of private information. The irrational noise view suggests that stock price synchronicity reflects irrational noise trading. Hou et al. (2006) argued that R^2 is related to investors' bias of information processing, proving that R^2 decreases with investor overreaction to firm-specific information[13]. Meanwhile, the possibility of price volatility and reversal tends to be higher, indicating that low R^2 indicates inefficient pricing. Wang Yaping (2009) found that synchronicity decreases as information transparency decreases, and this positive relationship weakens as institutional ownership increases[14].

The behavior of information intermediaries is a key bridge connecting information supply and stock price synchronicity. As core subjects, analysts' impact on synchronicity remains a point of disagreement. Ronnie (2005) found a close correlation between the divergence of analyst

opinions and stock mispricing[15]. Piotroski et al. (2004) was among the first to study the relationship between analysts and synchronicity, finding that a higher number of analysts leads to higher synchronicity[16]. The result suggests that analysts may offer non-firm-specific information, which increases the stock price synchronicity. Chan et al. (2006) studied the relationship in emerging markets and reached a similar conclusion that the more numbers of analysts, the more non-specific information[17]. Conversely, Zhu Hongjun et al. (2007) argue that analysts possess professional excavation and interpretation skills; and are capable of transmitting firm-specific information and thus lower synchronicity[18]. Yi Zhihong et al. (2015), using Chinese A-share data, found that female analysts provide richer firm-specific information[19]. This research triggered the differential impact of analyst heterogeneity.

With respect to the divergence of ESG rating, prior literature centers on its causes and economic outcomes. The main root of divergence lies in differences in the standard levels. Chatterji et al. (2016) argued that corporate ESG scores released by mainstream international information media showed obvious differences – the average correlation coefficient between agencies was tiny and doesn't converge within times[2]. Later, Berg et al. (2020) decomposed ESG divergence into scope, measurement, and weight differences, with measurement being the primary contributor[4]. Christensen et al. (2022) added that measurement differences arise from different indicator choices for unified ESG concepts[20]. Divergence is particularly evident in qualitative areas such as human rights and product safety. Min et al. (2022) noted that in the Chinese A-share market, more quantitative ESG disclosure leads to greater ESG divergence[21]. Additionally, Ma Wenjie and Yu Bojian (2023) pointed out that foreign agencies focus on disclosure standards, while domestic agencies focus on social responsibility performance[6]. This assessment preference, driven by property rights, amplifies divergence. Regarding economic consequences, Gibson Brandon et al. (2021) found that with the expansion of the divergence of ESG rating, stock returns increase, since the market asks for higher risk premium in response to ESG uncertainty, which may also mislead investors and discourage sustainable investment[22]. Serafeim et al. (2023) found that highly consensual ESG ratings have strong predictive power for future ESG news, whereas divergent ratings do not, suggesting that ESG rating divergence hinders firm-specific information from being integrated into prices[7]. Avramov et al. (2022) and Billio et al. (2021) confirmed that the ESG uncertainty inherent in rating divergence not only affects core pricing indicators like Alpha and Beta but also weakens investors' ability to effectively incorporate ESG preferences into asset pricing[23,24].

2.2. Hypothesis Development

ESG rating divergence reflects the differential assessments of corporate sustainability among different rating agencies. This divergence has two competing explanations regarding its impact on capital market information efficiency: On one hand, rating divergence constitutes irrational noise, thereby hindering the incorporation of firm-specific information into stock prices and leading to increased stock price synchronicity; on the other hand, divergence may serve as a manifestation of heterogeneous beliefs, enabling more firm-specific information to be discovered and incorporated into stock prices, thereby reducing stock price synchronicity. Therefore, this paper tests these competing hypotheses to examine the impact of ESG rating divergence on stock price synchronicity.

2.2.1. Main Effect Hypothesis

From the perspective of the noise effect, ESG rating divergence is regarded as typical market noise. First, ESG rating divergence stems from differences in evaluation criteria, indicator selection, measurement logic, and weight allocation among rating agencies[4]. Contradictory ratings weaken the consistency and reliability of market information[20]. For external investors, the divergence itself exacerbates cognitive confusion regarding corporate ESG performance, thereby triggering irrational wait-and-see behavior, decision hesitation, or

overreaction[25]. Second, in an environment of information confusion, investors' cost of information screening gradually increases. According to Sims's (2003) rational inattention theory, since investors' information processing capacity is a scarce cognitive resource, when the cost of processing ESG rating divergence exceeds its predictive benefits, investors will strategically choose to abandon in-depth analysis and processing of such information, adopting a "rational ignorance" strategy[26]. As investors' reliance on ESG-specific information decreases, the anchor points of investment decisions shifts. Investors tend to abandon the analysis of individual stock information and instead rely on market-level or industry-level public information characterized by low cost and high consensus for investment decisions[27]. This noise-driven trading weakens the efficiency with which firm-specific information is incorporated into stock prices through the trading process, ultimately driving up stock price synchronicity. Therefore, this paper proposes Hypothesis H1a:

Hypothesis 1a: ESG rating disagreement is significantly positively correlated with stock price synchronicity.

Based on information asymmetry theory and heterogeneous beliefs theory, this paper proposes the information effect hypothesis of ESG rating divergence. Miller (1977) notes that investors' heterogeneous beliefs stimulate information production and trading behavior[28]. Grossman & Stiglitz (1980) further demonstrate that when prices do not fully reflect the true value of assets, informed investors can obtain excess returns through information acquisition[29]. Within this framework, ESG rating divergence is not merely noise but reflects the diversified interpretations of corporate ESG risks by different rating agencies[4], containing firm-specific information that has not been fully priced by the market. When significant divergence exists in ESG ratings, it indicates that the current price system has failed to effectively integrate ESG-related information, and such pricing uncertainty creates arbitrage opportunities for institutional investors with professional information processing capabilities[29]. Unlike the "rational ignorance" hypothesis where investors turn to public information, driven by heterogeneous beliefs, rational traders view ESG divergence as a signal carrier for information mining, actively conducting in-depth research and cross-validating rating data to identify the true ESG performance of firms. In this process, more firm-specific information is discovered and incorporated into stock prices, reducing stock price synchronicity. Accordingly, this paper proposes the alternative hypothesis H1b:

Hypothesis 1b: ESG rating disagreement is significantly negatively correlated with stock price synchronicity.

2.2.2. Mediating Effect

Based on information intermediary theory, ESG rating divergence may affect stock price synchronicity through its impact on analyst behavior. Existing research indicates that ESG rating divergence has a dual impact mechanism on analyst forecasts: on one hand, the information conflict and ambiguity reflected by rating divergence stimulate analysts' motivation for information production and in-depth research to reduce forecast dispersion[30]. When rating agencies exhibit significant differences in assessing corporate ESG performance, analysts face greater reputation risk and interpretation pressure, thereby becoming more motivated to conduct data verification, cross-comparison, and field research to identify the true ESG quality of firms and its potential impact on fundamentals[31]. This information discovery mechanism helps reduce analyst forecast dispersion. On the other hand, rating divergence also increases analysts' information processing costs and forecast uncertainty[32]. Considering the improvement in analysts' professional capabilities and the accumulation of ESG research experience in recent years, this paper expects the information discovery mechanism to dominate, meaning that ESG rating divergence affects stock price synchronicity by reducing analyst forecast dispersion. Therefore, this paper proposes Hypothesis H2:

Hypothesis 2: Analysts dispersion functions as a mediating factor (masking effect) in the process of ESG rating divergence influencing stock price synchronicity.

3. Research Design

3.1. Sample Selection and Data Source

Chinese A-share listed companies during the period from 2018 to 2023 are chosen as the sample. The data of ESG rating are obtained from Wind, Huazheng, SynTao Green Finance, SusallWave and FTSE Russell. Financial data are obtained from the CSMAR database. The data are cleaned by excluding the financial industry, ST, and *ST stocks; retaining firms with ratings from at least two agencies; and excluding samples with missing explanatory or control variables. 6564 firm-year observations from 1094 listed companies are retained in the end. 1% and 99% winsorization of all continuous variables is also done.

3.2. Model Construction

In order to examine the main effect and mediating effect, this paper constructs following regression model:

$$Syn_{i,t} = \alpha_0 + \alpha_1 ESG_dis_{i,t} + \alpha_2 \sum Controls_{i,t} + \alpha_3 year_t + \epsilon_{i,t} \quad (1)$$

$$Ana_dis_{i,t} = \beta_0 + \beta_1 ESG_dis_{i,t} + \beta_2 \sum Controls_{i,t} + \beta_3 year_t + \epsilon_{i,t} \quad (2)$$

$$Syn_{i,t} = \delta_0 + \delta_1 ESG_dis_{i,t} + \delta_2 Ana_dis_{i,t} + \delta_3 \sum Controls_{i,t} + \delta_3 year_t + \epsilon_{i,t} \quad (3)$$

In models (1), (2) and, (3), *Syn* is stock price synchronicity, *ESG_dis* is ESG rating divergence, *Ana_dis* is analyst dispersion, *Controls* stand for the control variables, and *year* represents year fixed effect. We need to focus on the size and significance of α_1 and other coefficients to test for mediation. Since ESG divergence varies greatly by industry, we only retain year fixed effects to avoid weakening the core explanatory variables' power.

3.3. Variable Definitions and Calculation

(1). Stock Price Synchronicity (*Syn*): We refer to the previous literature (Yi Zhihong, 2019) to calculate the stock price synchronicity[33].

$$R_{i,w,t} = \beta_0 + \beta_1 R_{M,w,t} + \beta_2 R_{M,w-1} + \beta_3 R_{I,w,t} + \beta_4 R_{I,w-1,t} + \epsilon_{i,w,t} \quad (4)$$

where $R_{i,w,t}$ denotes the return of stock *i* in week *w* of year *t* with reinvestment of cash dividends. $R_{M,w,t}$ represents the circulation market value-weighted average return of all A-share listed companies in week *w* of year *t*. $R_{I,w,t}$ is the circulation market value-weighted average return of other stocks in the industry to which stock *i* belongs in week *w* of year *t*, excluding stock *i* itself.

Then, R^2 is logarithmically transformed to obtain $Syn_{i,t}$.

$$Syn_{i,t} = \ln\left(\frac{R_{i,t}^2}{1 - R_{i,t}^2}\right) \quad (5)$$

(2). ESG Rating Divergence (*ESG_dis*): This paper selects five mainstream ESG rating agencies as sample data. As the ESG scores of different rating agencies differ in dimension and range, min-max normalization is applied to all rating data to ensure comparability across agencies. Following Wang (2023), this paper constructs a comprehensive indicator to measure the divergence of ESG rating using the range of normalized scores and the standard deviation of all agencies that rated the firm[34]. The range method directly reflects the absolute numerical differences in firms' ESG performance across rating agencies, while the ranking method focuses more on the divergent perceptions of firms' relative ESG standing. This paper argues that the integration of the two methods can simultaneously capture the absolute and relative differences in ESG scores, making it a more comprehensive measurement of rating divergence.

(3). Analyst Dispersion (*Ana_dis*): Following Qu Xiaohui et al. (2016), this paper constructs the measure of analyst dispersion as follows[35]:

$$Ana_dis_{i,t} = \frac{forecast_std_{i,t+1}}{Price_{i,t}} = \frac{\sqrt{\sum_{j=1}^N (Feps_{j,i,t+1} - \overline{Feps}_{i,t+1})^2}}{(N-1) Price_{i,t}} \quad (6)$$

where $Ana_dis_{i,t}$ denotes the analyst earnings forecast dispersion for firm i in year $t+1$. $Feps_{j,i,t+1}$ is the earnings per share forecast for firm i in year $t+1$ issued by analyst j . $\overline{Feps}_{i,t+1}$ is the mean value of earnings per share forecast for firm i in year $t+1$ across all analysts. N represents the total number of analysts who issue forecasts. $Price_{i,t}$ is the stock price of firm i at the beginning of year t , which is used for standardization to ensure comparisons across firms with different stock price levels.

(4). Control Variables: referring to the studies of Yi Zhihong (2018) as well as Liu Xiangqiang et al. (2023), the following control variables are included :return on asset (*Roa*), firm size (*Size*), leverage ratio (*Lev*), market-to-book ratio (*Mb*), firm age (*Age*), stock turnover (*Vol*), ownership percentage of the largest shareholder (*Ihr*), institutional investor ownership ratio (*Inshare*), analyst coverage (*Analyst*), growth rate of operating revenue (*Growth*), and stock return volatility (*Sigma*)[33,36]. The variable definitions are shown in Table 1.

Table 1. Variable Definitions

Variable Type	Symbol	Name	Definition
Dependent Variabel	Syn	Stock Price Synchronicity	Estimated from regressions of individual stock returns on market returns and industry returns
Independent Variable	ESG_dis	ESG Rating Divergence	The range of normalized ESG scores and the standard deviation of rankings from five rating agencies
Mediating Variable	Ana_dis	Analyst Dispersion	Standard deviation of analysts' earnings forecasts per share
Control Variable	Roa	Return on Assets	Ratio of net profit to to assets
	Size	Firm Size	Natural logarithms of total assets
	Lev	Leverage Ratio	Ratio of total liabilities to total assets
	Mb	Book-to-Market Ratio	Ratio of book value to market value
	Age	Firm Age	Number of years since listing
	Vol	Stock Turnover	Ratio of total shares traded in year to total outstanding shares
	Ihr	Ownership of the largest Shareholder (%)	Percentage of shares held by the largest shareholder
	Inshare	Institutional Investor Ownership (%)	Ratio of shares held by institutional investors to total outstanding shares
	Analyst	Analyst Coverage	Numbers of analysts (teams) following
	Growth	Operating Revenue Growth Rate	Growth rate of the main business revenue compared with the previous year
	Sigma	Market Volatility	Standard deviation of weekly market returns in the year

4. Empirical Analysis

4.1. Descriptive Statistics

Table 2 represents the descriptive statistics of the main variables. The mean, median, and standard deviation of stock price synchronicity are -0.433, -0.376, and 0.855, respectively, implying that stock price synchronicity varies considerably across sample firms. As for ESG rating divergence, the mean value is 2.317, the median is 2.047, and the standard deviation is 1.400, which reflects that rating agencies hold divergent views towards the same firms. For analyst dispersion, the descriptive statistics are 0.022, 0.0353, and 0.024, respectively. For the other control variables, the mean values are as follows: return on assets = 0.038; firm size = 23.021; leverage ratio = 0.444; book-to-market ratio = 0.716; firm age = 15.363; stock turnover = 3.874; ownership of the largest shareholder = 0.338; institutional investor ownership = 0.465; analyst coverage = 7.775; operating revenue growth rate = 0.192; market volatility = 0.029.

Table 2. Descriptive Statistics

Variable	Observations	Mean	Median	Std	Min	Max
Syn	6565	-0.433	-0.376	0.855	-2.790	1.359
ESG_dis	6565	2.317	2.047	1.400	0.074	5.720
Ana_dis	6565	0.022	0.014	0.024	0	0.148
Roa	6565	0.038	0.0353	0.0559	-0.168	0.204
Size	6565	23.021	22.800	1.409	20.430	27.130
Lev	6565	0.444	0.441	0.186	0.075	0.858
Mb	6565	0.716	0.719	0.268	0.145	1.275
Age	6565	15.363	15.000	7.173	3.000	29.000
Vol	6565	3.874	2.941	3.112	0.388	16.004
Ihr	6565	0.338	0.316	0.146	0.082	0.703
Inshare	6565	0.465	0.489	0.239	0.004	0.921
Analyst	6565	7.775	2.000	11.270	0	49.000
Growth	6565	0.192	0.080	0.505	-0.662	3.029
Sigma	6565	0.029	0.023	0.009	0.016	0.045

4.2. Baseline Regression

Table (3) shows the baseline regression results. Column (1) refers to results including year fixed effects. The regression coefficient of ESG_dis is 0.0824 and is statistically significant at 1% level. Column (2) presents the estimation results further incorporating control variables. The coefficient is 0.016 and is still significant at the level of 1%. This demonstrates that after controlling firm profitability, size, leverage and other firm characteristics, the relationship remains unchanged, which proves the hypothesis 1a.

Table 3. Baseline Regression

Variable	(1)	(2)
	Syn	Syn
ESG_dis	0.0824*** (12.11)	0.016** (2.07)
Roa	-	0.932*** (4.72)
Size	-	0.131*** (9.25)
Lev	-	-0.341*** (-5.23)
Mb	-	0.424*** (7.75)
Age	-	0.006*** (4.24)
Vol	-	0.003*** (0.86)
Ihr	-	0.0149 (0.19)
Inshare	-	-0.242*** (-4.17)
Analyst	-	0.002** (1.99)
Growth	-	-0.002 (-0.13)
Sigma	-	-3.408 (-1.59)
Constant	-0.181*** (-6.55)	-3.120*** (-10.85)
Year	YES	YES
N	6565	6565
Adjusted R ²	0.190	0.258

4.3. Mediating Effect Test

Table (4) reports the findings of the mediating effect test. Column (1) presents the regression results of analyst dispersion on ESG rating disagreement. The results indicate that the coefficient of ESG_dis is -0.004, which is statistically significant at the level of 5%. This means that the greater the ESG rating divergence, the lower the analyst dispersion. Column (2) shows the regression results with analyst dispersion included. The regression coefficient of analyst dispersion is 1.043, significant at the 5% level. Meanwhile, the direct effect coefficient is 0.0222, and it is also significant at the 5% level. The coefficient of ESG_dis decreases but remains significant. The results indicate that analyst dispersion functions as a masking factor when ESG rating disagreement influences stock price synchronicity.

Table 4. Stepwise Regression Results

Variable	(1)	(2)
	Ana_dis	Syn
ESG_dis	-0.004** (-1.97)	0.022** (2.41)
Ana_dis	-	1.043** (2.25)
Roa	-0.335*** (-4.41)	0.867*** (3.54)
Size	0.0016*** (3.18)	0.123*** (7.38)
Lev	0.0044* (1.76)	-0.343*** (-4.19)
Mb	0.024*** (12.06)	0.459*** (7.10)
Age	-0.00003*** (-0.52)	0.005*** (3.08)
Vol	0.0005*** (3.67)	0.014*** (3.08)
lhr	0.003 (1.11)	0.075 (0.81)
Inshare	-0.0078*** (-3.74)	-0.197*** (-2.91)
Analyst	0.00003 (0.77)	0.0026** (2.03)
Growth	-0.0026*** (-3.65)	-0.005 (-0.24)
Sigma	0.039 (0.5)	-1.324 (-0.52)
Constant	-0.040*** (-3.78)	-3.131*** (-9.14)
Year	YES	YES
N	6565	6565
Adjusted R ²	0.1326	0.229

4.4. Robustness Tests

4.4.1. Alternative Measures

(1) Alternative measure of the Syn

Following the research of Wang Yaping et al. (2009), this paper adjusts the calculation method of stock price synchronicity[14]. Specifically, the market return in week *t* and the industry return in week *t* is chosen as independent variables in model (4). The R² obtained from the regression is logarithmically transformed to generate a new indicator (Syn2). According to the regression outcomes, the coefficient of ESG_dis is still positive and significant, which stays the same with previous results.

(2) Alternative measure of the *ESG_dis*

Table 5 shows the outcomes of robustness test. The standard deviation method is applied to form a new indicator of ESG rating divergence(*ESG_dis2*). The coefficient of ESG_dis remains positive at the 5% level.

Table 5. Robustness Test

	Syn2		Syn
ESG_dis	0.0197** (2.13)	ESG_dis2	0.0166** (2.06)
Controls	Yes	Controls	Yes
Year	Yes	Year	Yes
Cons	-4.395*** (-13.11)	Cons	-3.127*** (-10.73)
N	6565	N	6565
Adjusted R ²	0.2509	Adjusted R ²	0.2605

4.4.2. Lagged Explanatory Variable

This paper lags the explanatory variable ESG rating divergence by one period, denoted as *L1_ESG_dis*. Since the one-period lagged ESG rating divergence occurs before the current-period stock price synchronicity, the method can mitigate the possibility of reverse causality to interfere with the outcomes. According to the results, the coefficient of the *L1_ESG_dis* continues to be positive at the 5% level.

4.4.3. Instrumental Variable Method

The instrumental variable methods are applied to test for endogeneity. The reason is that there may be the existence of two-way causality when regressing model (1). In addition, distortions in the regression outcomes may also arise from the potential interference of omitted variables. In order to alleviate these issues, following the designs of Wang et al. (2015), Chen et al. (2025), this paper uses the average ESG rating divergence of other peer enterprises in the identical industry and year as the instrumental variable of *ESG_dis*[37,38]. With regard to the relevance requirement of the instrumental variable, ESG rating criteria are industry related. Firms within the same industry share similar evaluation logic and indicator weights. Therefore, the new *ESG_dis* can effectively reflect the overall rating environment and be related with the excluding firm. In terms of the exogeneity assumption of instrumental variables, the industry average is an industry-level indicator that captures aggregate industry characteristics. It presents no direct impact on the stock price synchronicity of individual enterprises.

Table 6 presents the regression results using the instrumental variable (IV) approach. In Column (1), the first-stage coefficient on the IV is 0.19 (significant at the 1% level), satisfying the relevance condition. The F-statistic is 40.69, ruling out concerns regarding weak instruments. The second-stage results in Column (2) show that the coefficient on *ESG_dis* is 0.428 (significant at the 1% level), indicating that the positive main effect remains robust after effectively addressing endogeneity concerns.

Table 6. Instrumental Variable Method

	(1) First stage	(2) Second stage
ESG_dis		0.428*** (3.57)
IV	0.190*** (6.38)	
Controls	Yes	Yes
Year	Yes	Yes
Cons	-13.059*** (-31.26)	2.241 (1.4)
F statistic	40.6972	
Robust LM statistic	16.7139 (p=0.0000)	
N	6565	6565

5. Further Analysis

5.1. Mechanism Analysis

Previous sections have verified the information mediation effect of analyst dispersion in the pathway from ESG rating divergence to stock price synchronicity. However, for information to truly intervene in the price formation process, it must be translated into the trading behaviour of investors[39]. When facing high ESG rating disagreement, investors often choose to reduce trading due to “ambiguity aversion”. This behavioural change affects stock price formation through the channel of trading activity. Therefore, this paper extends the analysis to examine the mechanism by focusing on investors’ trading behavior and constructs model (7):

$$Turnover_{i,t} = \gamma_0 + \gamma_1 * ESG_dis_{i,t} + \sum Controls + \epsilon_{i,t} \quad (7)$$

When a firm faces high ESG rating divergence, the market perceives ambiguity regarding the true level of its ESG performance. This information uncertainty significantly impacts investors’ behaviour. According to behavioral finance theory, investors typically display “ambiguity aversion” in the presence of high information uncertainty[40]. Fearing misjudgement and potential losses, investors are inclined to take a cautious “wait-and-see” approach, reducing trading frequency, which lowers the turnover rate. According to the market microstructure theory, transaction behavior acts as the core channel for integrating market information into stock pricing. When turnover decreases, transactions based on private and specific information decline. This leads to the result that company-specific information is unable to integrate into stock prices efficiently through public trading. This ultimately pushes up stock price synchronicity[12]. To verify this mechanism, this paper examines the relationship between the divergence of ESG rating and stock turnover. According to results reported in Table 7, the coefficient of ESG_dis is significantly negative at the 1% level. This implies that as divergence of ESG rating increases, stock turnover tends to decrease, consequently leading to higher levels of stock price synchronicity. This evidence proves that stock turnover does serve as an important transmission channel.

Table 7. Mechanism Analysis

	Turnover
ESG_dis	-0.182*** (-6.77)
Controls	Yes
Year	Yes
Cons	8.949*** (9.61)
N	6565
Adjusted R ²	0.331

5.2. Heterogeneity Analysis

5.2.1. Heterogeneity based on Analyst Forecast Dispersion

Analyst dispersion reflects the degree of disagreement in judgements on a firm’s performance. Existing literature has found that lower analyst dispersion means the market has a more consistent expectation of the firm value, which helps investors effectively identify and incorporate specific information on the firm level into stock prices; in contrast, larger analyst

dispersion exacerbates information asymmetry and reduces the content of firm-specific information in stock prices. When facing high analyst dispersion, investors find it hard to form stable and consistent judgements of firms' value, so external information noise is more likely to dominate the stock price changes. If analysts' expectations tend to be similar, investors can integrate information more and accurately price the company with determination and confidence. Therefore, this paper argues that lower analyst dispersion can reduce the influence exerted by ESG rating divergence on stock price synchronicity.

This paper uses the annual quantile of analyst dispersion as the classification rule to partition the sample into two subgroups according to the level of analyst dispersion: high-dispersion group and low-dispersion group, which are then regressed in model (1). As shown in Columns (1) and (2) of Table 8, the coefficient of ESG_dis is positive yet not significant for high-dispersion group, while it is significantly positive at the 5% significance level for low-dispersion group. When comparing the magnitude of the coefficients across groups, the results of the inter-group difference test reveal a significant disparity between the high and low analyst dispersion samples. The results indicate that lower analyst dispersion can mitigate the main effect.

5.2.2. Heterogeneity based on ESG performance

Prior research has demonstrated that firms with better ESG performance are more prone to becoming the focus of attention from investors and other capital market stakeholders. Investors also have higher value expectations and information sensitivity to its ESG performance[41]. Institutional investors show a stronger investment preference for company with higher ESG ranks, making them "star targets" of market attention[41]. On the contrary, market's attention to firms with poor ESG performance is relatively low. Investors lack sufficient motivation to respond to disagreements in the ESG information. This renders the process of incorporating specific information into stock prices less susceptible to ESG rating disagreements. Therefore, this paper expects that a higher level of ESG rating scores will amplify the impact of ESG rating divergence on stock price synchronicity.

This paper uses the firm's average ESG score to measure its ESG performance level. Using the same methods as before, two groups are obtained and then regress them in model (1) respectively. In the high ESG performance subsample, the coefficient on ESG_dis is significantly positive at the level of 5%. In contrast, for firms with weak ESG performance, the coefficient is positive but not significant at the 10% level. The results indicate that high ESG performance firms will break the low-risk consensus and amplify the stock price synchronicity.

Table 8 is the combined outcomes of heterogeneity analysis according to analyst forecast dispersion and ESG performance level.

Table 8. Heterogeneity Analysis

	(1) High analyst dispersion	(2) Low analyst dispersion	(3) High ESG performance	(4) Low ESG performance
ESG_dis	0.01 (1.01)	0.026** (1.89)	0.028** (2.4)	0.016 (1.29)
Controls	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Cons	-3.297*** (-10.61)	-3.286*** (-7.41)	-3.152*** (-9.42)	-3.800*** (-9.60)
N	3282	3282	3282	3282
Adjusted R ²	0.305	0.201	0.241	0.287

6. Conclusion and Recommendations

This paper takes Chinese A-share listed companies from 2008 to 2023 as sample and obtains ESG rating data from five institutions. The main objective is to empirically examine the effect of ESG rating divergence on stock price synchronicity, where analyst forecast dispersion acts as a key mediating factor.

Baseline regression analysis reveals a significantly positive relationship between ESG rating divergence and stock price synchronicity, and it remains effective after taking robustness tests. Through stepwise regression, this paper finds that the divergence of ESG rating is negatively related to analyst forecast dispersion, whereas analyst forecast dispersion exhibits a significantly positive association with stock price synchronicity. When analyst dispersion is added to the regression equation, the coefficient of ESG rating divergence is reduced yet still maintains its statistical significance, indicating that analyst dispersion plays a masking effect during the process of ESG rating divergence influencing stock price synchronicity. In other terms, analysts, acting as information intermediaries, can effectively recognize and reduce information noise caused by divergent ESG ratings, promoting the integration of specific information into stock prices.

Drawing upon previous content, this paper further offers the following policy recommendations and practical suggestions:

- (1) Strengthen the standardization and industry comparability to reduce rating divergence across agencies. Authorities should further improve ESG disclosure standards, unify the disclosure framework and evaluation criteria so as to reduce rating divergence caused by differences in indicator selection, measurement methods and weighting.
- (2) Attach more importance to analysts' role in interpreting ESG information. Analysts can reduce the decline in price efficiency caused by ESG rating divergence through integration and professional judgments. Analysts should be encouraged to conduct in-depth interpretation of ESG information and enhance the professionalism and consistency of ESG research to better fulfill their function as information intermediaries.
- (3) Guide investors to rationally treat rating differences of high-ESG firms. High-ESG firms receive more market attention, and their ESG rating disagreement exerts a more prominent impact on stock price volatility. Investors should be guided to comprehensively understand the connotation of ESG performance, avoid overreaction to ESG rating differences, and improve their ability to identify and price firm-specific information. Meanwhile, firms should be obliged to improve the quality of information disclosure to stabilize market expectations.

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