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THE IMPACT OF PATIENT CAPITAL ON ESG RATING DIVERGENCE

GuanNan Liu
School of International Economics, China Foreign Affairs University, Beijing 102206, China.
Corresponding Email: Liuguannan@mail.cfau.edu.cn

Abstract: The ESG ratings issued by ESG rating agencies have emerged as a vital reference for investors and creditors when making decisions. However, the differences in ESG ratings provided by various agencies not only bring noise into the capital market but also affect the development of patient capital. This study takes Chinese A-share listed companies from 2015 to 2022 as the sample and uses a fixed-effects model to empirically examine the influence of ESG rating divergence on patient capital. The findings show that ESG rating divergence leads to a reduction in patient capital. Further analysis indicates that ESG rating divergence intensifies the degree of information asymmetry in the market and lowers stock liquidity, which in turn reduces patient capital. This impact is more significant in non-state-owned enterprises and companies with high-quality ESG information disclosure. This research offers empirical evidence for the standardization of the ESG rating system construction, the enhancement of patient capital, and the advancement of high-quality economic development.
Keywords: Patient capital; ESG rating divergence; Market information asymmetry; Stock liquidity

1 INTRODUCTION

As China's economy enters a stage of high-quality development, traditional growth models have become unsustainable, with issues such as rising labor costs tightening resources and environmental constraints becoming increasingly prominent. Patient capital, as a form of long-term-oriented investment, can provide continuous financial support to enterprises, promoting their long-term development and innovation capabilities [1].

Patient capital refers to funds willing to make long-term investments, not pursuing short-term returns but expecting greater benefits in the future [2]. Due to the characteristics of low risk and long cycles, ESG investment aligns well with the value concepts of patient capital such as institutional investment, social security funds, and pension funds, making ESG investment an important field for the allocation of patient capital. A survey by Mercer Investment shows that 89% of pension institutions indicate that they will incorporate ESG factors into their investments, a proportion higher than other types of institutions. Taking the Japanese Government Pension Investment Fund as an example, with a total asset size of $1.61 trillion, about $99.22 billion is invested in ESG indices, accounting for nearly 12.3%.

However, existing research has found that different ESG rating agencies do not have high consistency in rating the same company, and there is a significant phenomenon of ESG rating divergence [3]. The rating divergence of agencies may affect investors' decisions, especially when the differences are large. Kotsantonis (2019) found that ESG rating differences are one of the main barriers to ESG investment and may reduce investors' willingness to invest in companies with rating differences [4].

This issue needs further study to discover whether ESG rating divergence will affect patient capital and what its mechanism of action is. Current research on ESG rating divergence mainly focuses on the causes of ESG rating divergence and its impact on capital market efficiency, companies, and auditors' risk response behavior, as well as investor behavior, with little research exploring its impact on patient capital. In light of this, this study uses companies listed in China's A-share from 2015 to 2022 as a research sample to explore the influence of ESG rating divergence on patient capital and its working mechanism.

2 MODEL CONSTRUCTION

2.1 Data Sources

This study selects A-share listed companies in China that have been rated by at least two of the four rating agencies, Huazheng, WIND, SynTao, and MengLang, from 2015 to 2022.The data was screened in the following steps:

(1) Excluding the ST or*ST companies in special treatment status;
(2) Excluding the data from listed companies belonging to the financial sector;
(3) Excluding the data with incomplete information on key variables;
(4) Excluding companies with ESG score records of less than two years.

Following the selection process, the study ultimately included 1,127 companies listed on the Chinese A-share market as subjects of analysis. The ESG ratings for these corporations were sourced from databases provided by Huazheng, WIND, SynTao Green, and MengLang. Concurrently, the companies' informational and financial records were obtained from the CSMAR database.

2.2 Variable Selection

The dependent variable is the institutional holding ratio, calculated as the total number of shares held by institutional investors divided by the total number of circulating shares. Investors with a stable equity stake often have a strategic development perspective, enabling them to conduct comprehensive and in-depth analysis of companies, and are more willing to actively supervise and govern companies effectively. Therefore, the institutional holding ratio is a good measure of patient capital.

The independent variable is ESG rating divergence. This study uses four approaches to measure corporate ESG rating divergence: Huazheng ESG rating, WIND ESG rating, Shangdao Ronglv ESG rating, and Menglang FIN-ESG rating. The first three are categorized into nine levels, with ratings from C to AAA assigned values from 1 to 9, while Shangdao Ronglv ESG rating is categorized into ten levels, with ratings from D to A+ assigned values from 0 to 9. After organizing the four ESG rating methods, the standard deviation of the ESG rating scores is computed to get the data for ESG rating divergence.

A set of control variables is called a control variable. This work controls the parameters at the corporate level and refers to Cai and others' studies when choosing control variables [5]. And descriptive statistics are showed in Table 1.

Table 1 Descriptive Statistics

Symbols	Observations	Maximum	Minimum	Average	Standard deviation	median	variance
I	12104	1.898	0	0.417	0.231	0.426	0.053
D	12107	4.243	0.5	1.277	0.563	1.258	0.317
Size	12105	28.607	16.412	22.731	1.414	22.573	1.999
Lev	12105	178.345	0.008	0.474	1.656	0.449	2.742
ROA	12105	12.211	-9.117	0.03	0.179	0.033	0.032
ListAge	12104	2.222	-0.997	0.051	0.079	0.049	0.006
FirmAge	12105	168.498	-0.997	0.209	2.27	0.081	5.153
Opcf	12105	2.89	1.386	2.12	0.202	2.197	0.041
Mfee	12105	0.955	0.088	0.557	0.154	0.554	0.024
Board	12105	41.595	0.018	1.387	1.899	0.847	3.607
Growth	12105	3.497	0	2.533	0.663	2.565	0.44
BM	11986	4.447	-5.921	-0.021	0.441	0.001	0.194
Dturn	11932	3404.611	0.001	0.721	38.106	0.059	1452.035

2.3 Basic Regression

Because of the existence of ESG rating divergence, investors have lower trust in ESG ratings, making themselves more cautious when implementing ESG integration. This distrust may lead investors to pay less attention to ESG investments and reduce the investment of patient capital [6-7]. ESG rating divergence amplifies the synchronicity of company stock prices, affecting the market's effective pricing of ESG information and reducing the pricing efficiency of the capital market, thereby decreasing the investment of patient capital [8]. Hence, this study hypothesize that:

H_1: An increase in corporate ESG rating divergence will reduce patient capital.

To explore the effects of ESG rating divergence on patient capital, this paper establishes a panel linear regression model as follows:

$$I_{it} = \beta_0 + \beta_1 D_{it} + \beta_n Controls_{it} + \sum Year + \sum Industry + \varepsilon_{it} \quad (1)$$

where i is the sample number, t is the time, and the dependent variable represents the institutional holding ratio of the i sample company in year t. The independent variable represents the ESG rating divergence of the i sample company in year t. $Controls_{it}$ is a set of control variables used in this paper, Industry and Year represent the dummy variables for industry and year, respectively. The coefficient β_1 is used to reflect the extent of the effects of corporate ESG rating divergence on patient capital.

2.4 The Mediating Effect of Market Information Asymmetry

ESG rating divergence widens market info asymmetry. The notable rise in rated firms' stock price synchronicity reflects ESG rating divergence's "noise effect," intensifying market information asymmetry [9]. Moreover, ESG rating divergence reduces capital market info efficiency. This asymmetry makes it harder for investors to accurately assess companies' values, thereby decreasing patient capital. Thus, the paper puts forward the hypothesis:

H_2: Corporate ESG rating divergence can reduce patient capital by increasing market information asymmetry.

Listed companies' transparency gauges the degree of information asymmetry, with stock exchanges' disclosures as the benchmark. Grades A, B, C, D correspond to 4, 3, 2, 1. To examine how corporate ESG rating divergence impacts market information asymmetry, the paper sets up the mechanism regression model below:

$$CO_{it} = \beta_0 + \beta_1 D_{it} + \beta_n Controls_{it} + \sum Year + \sum Industry + \varepsilon_{it} \quad (2)$$

2.5 The Mediating Effect of Stock Liquidity

ESG rating divergence reduces stock liquidity. A higher ESG rating can improve stock liquidity, while ESG rating divergence increases the operating risk of companies, reduces positive market expectations, and increases the market's risk aversion, leading to a decrease in stock liquidity. Low liquidity means that investors have difficulty buying and selling stocks in the short term, increasing the uncertainty and risk of investment, and thus reducing patient capital. Based on this, this paper hypothesize that:

H_3: Corporate ESG rating divergence would reduce patient capital by decreasing stock liquidity.

This paper draws on the Roll model proposed by Roll (1984) to measure stock liquidity [10].

$$\text{Roll} = \begin{cases} 2\sqrt{-\text{cov}(\Delta P_t, \Delta P_{t-1})}, & -\text{cov}(\Delta P_t, \Delta P_{t-1}) < 0 \\ 0 \quad , & -\text{cov}(\Delta P_t, \Delta P_{t-1}) \geq 0 \end{cases} \tag{3}$$

To explore the impact of corporate ESG rating divergence on market information asymmetry, this study establishes the following mechanism regression model:

$$\text{LIQ}_{it} = \beta_0 + \beta_1 D_{it} + \beta_n \text{Controls}_{it} + \sum \text{Year} + \sum \text{Industry} + \varepsilon_{it} \tag{4}$$

3 RESULTS

3.1 Basic Regression Results

The baseline regression results of the basic regression are shown in Table 2, showing the impact of corporate ESG rating divergence on patient capital. The ESG rating divergence has a negative effect on patient capital, which is significant at the 1% level, and this result remains significant at the 1% level even after controlling for other variables and fixing for industry and year, thus validating the hypothesis. This indicates that there is a significant effect of corporate ESG rating divergence on patient capital; the greater the ESG rating divergence, the smaller the patient capital.

Table 2 Basic Regression Results

	I			
D	-0.012***	-0.019***	-0.150***	-0.291***
	（-3.74）	（-5.432）	（-4.65）	（-7.85）
Size	0.072***		0.075***	
	（43.021）		（44.56）	
Lev	0.004***		0.004***	
	（3.424）		（3.49）	
ROA	0.008***		0.082***	
	（6.668）		（6.69）	
ListAge	0.044***		0.052***	
	（12.02）		（14.28）	
FirmAge	-0.008		0.001	
	（-0.986）		（0.001）	
Opcf	0.124***		0.151***	
	（5.18）		（6.26）	
Mfee	0.001**		0.001**	
	（2.009）		（1.82）	
Board	0.116***		0.126***	
	（12.583）		（13.44）	
Growth	-0.003***		-0.003***	
	（-3.482）		（-3.61）	
BM	-0.017***		-0.013***	
	（-13.268）		（-10.90）	
Dturn	-0.025***		-0.027***	
	（-5.882）		（-6.25）	
Industry	YES	YES	NO	NO
Year	YES	YES	NO	NO
N	11815	12104	11815	12104
R^2	0.271	0.005	0.271	0.005

Note: ***,** and* represent significance at 1%, 5% and 10%, respectively, and the same below.

3.2 Mechanism Analysis Results

3.2.1 Market information asymmetry

According to the regression results in Table 3, corporate ESG rating divergence significantly increases the degree of market information asymmetry. The increase in information asymmetry due to ESG rating divergence reduces the efficiency with which ESG information is conveyed to investors, making it difficult for rating results to accurately reflect and predict future market information about companies. Investors may adopt a more cautious attitude towards these companies, leading to a decrease in patient capital.

Table 3 The Regression Results of Mechanism Analysis

	CO			
D	-0.235***	-0.248***	-0.231***	-0.245***
	（-11.616）	（-16.873）	（-16.32）	（-16.73）
Controls	YES	NO	YES	NO
Industry	YES	YES	NO	NO
Year	YES	YES	NO	NO
N	11815	12107	11815	12107
R^2	0.056	0.023	0.056	0.023

3.2.2 Stock liquidity

According to the regression results in Table 4, corporate ESG rating divergence significantly reduces stock liquidity. ESG rating divergence increases the uncertainty of the market regarding the operational risks of companies, reduces positive market expectations, and thus leads to a decrease in stock liquidity. Low stock liquidity typically implies lower market activity and poorer pricing efficiency, which can prompt more patient capital to decrease its holdings in stocks.

Table 4 The Regression Results of Mechanism Analysis

	LIQ			
D	0.001***	0.002***	0.001***	0.001***
	（4.407）	（7.882）	（4.46）	（6.62）
Controls	YES	NO	YES	NO
Industry	YES	YES	NO	NO
Year	YES	YES	NO	NO
N	11815	12106	11815	12106
R^2	0.183	0.003	0.183	0.003

3.3 Heterogeneity Analysis Results

3.3.1 Heterogeneity analysis based on corporate property rights attributes

This paper introduces two dummy variables for state-owned enterprises (SOEs) and non-state-owned enterprises. When SOE equals 1, the enterprise is a state-owned company; when SOE equals 0, the enterprise is non-state firm. According to Table 5, compared to state-owned firm, the impact of ESG rating divergence on patient capital is more significant in non-state firm, which validates the hypothesis. Ma Wenjie (2023) pointed out that domestic rating agencies tend to give higher ESG ratings to state-owned company and lower ratings to non-state-owned firm. Institutional investors have a preference for companies with good ESG performance, which can attract more institutional capitals and thus mitigate the influence of ESG rating divergence on patient capital for state-owned enterprises.

3.3.2 Heterogeneity analysis based on corporate information disclosure quality

This paper constructs a dummy variable, GRI, based on whether a company's ESG disclosure complies with the globally acknowledged GRI Sustainability Reporting Framework, to measure the quality of corporate ESG information disclosure. A value of 1 indicates compliance with the GRI framework, while 0 indicates non-compliance. According to Table 5, compared to companies that disclose following the GRI Sustainability Reporting Framework, the impact of ESG rating divergence on patient capital is more significant in companies that do not comply with the GRI framework, which validates the hypothesis. The reason for this is that adhering to the internationally recognized GRI Sustainability Reporting Framework for information disclosure can provide ESG rating agencies with more standardized corporate ESG information, reducing the subjectivity of their ratings and enhancing the credibility of corporate information. This, in turn, reduces the likelihood of ESG rating divergence and its impact on patient capital.

Table 5 The Regression Results of Heterogeneity Analysis

SOE=1	I		GRI=1	I	
D	-0.012	-0.006	D	-0.02	-0.008
	（-1.685）	（-1.266）		（-1.276）	（-0.834）
Controls	YES	NO	Controls	YES	NO
Industry	YES	YES	Industry	YES	YES
Year	YES	YES	Year	YES	YES
N	4375	4506	N	1552	1623
R^2	0.274	0.001	R^2	0.225	0.001
SOE=0	I		GRI=0	I	
D	-0.006	-0.013***	D	-0.012***	-0.019***
	（-1.415）	（-3.019）		（-3.402）	（-4.966）
Controls	YES	NO	Controls	YES	NO
Industry	YES	YES	Industry	YES	YES
Year	YES	YES	Year	YES	YES
N	7440	7598	N	10254	10472

R^2	0.181	0.001	R^2	0.237	0.005

3.4 Robustness Tests

3.4.1 Changing the sample size

On September 30, 2018, the China Securities Regulatory Commission (CSRC) provided clear guidance for the public disclosure of ESG information by listed companies. On June 21 of the same year, all listed companies included in the MSCI index were subject to ESG ratings, promoting the integration of the A-share market with international markets. Therefore, the year 2018 marks a significant milestone in the development of ESG in China. Based on this, this paper excludes samples before 2018 and uses samples from the five-year period of 2018-2022 to test the regression. Table 6 shows that after excluding some samples, the coefficient of D remains significant, indicating that the effect of corporate ESG rating divergence on patient capital still exists after reconsidering the sample, thus verifying the robustness.

Table 6 The Result of Robustness Testing

	I			
D	-0.012***	-0.025***	-0.169***	-0.038***
	（-3.68）	（-6.746）	（-5.00）	（-9.81）
Controls	YES	NO	YES	NO
Industry	YES	YES	NO	NO
Year	YES	YES	NO	NO
N	11101	11330	11101	11330
R^2	0.260	0.001	0.260	0.001

3.4.2 Changing the explanatory variable

Referring to the research by He Taiming (2023), this paper adds the ESG ratings from Bloomberg and FTSE Russell to the existing ESG rating divergence [11]. The Bloomberg ESG rating takes the specific score and rounds it to the nearest 10%, and the FTSE Russell ESG rating takes the specific score and doubles it (i.e., multiplies by 200%) for the sample data. This paper calculates the standard deviation of the ESG rating scores from the six types of index to calculate data on ESG rating divergence. According to Table 7, after changing the explanatory variable, the increase in ESG rating divergence remains highly significant in enhancing corporate financing constraints, thus verifying the robustness.

Table 7 The Result of Robustness Testing

	I			
Ds	-0.006*	-0.148***	-0.006**	-0.152***
	（-1.671）	（-3.885）	（-2.00）	（-4.12）
Controls	YES	NO	YES	NO
Industry	YES	YES	NO	NO
Year	YES	YES	NO	NO
N	13867	14197	13867	14197
R^2	0.250	0.001	0.250	0.001

4 CONCLUSION AND RECOMMENDATIONS

This study selected A-share listed companies that were rated by at least two of the four rating agencies, Huazheng, WIND, Shangdao Ronglv, and Menglang, over the eight-year period from 2015 to 2022. This paper conducted an empirical research on the effect of corporate ESG rating divergence on patient capital and the mechanisms through which this impact occurs, leading to the following conclusions:

(1) An increase in corporate ESG rating divergence reduces patient capital.

(2) Corporate ESG rating divergence reduces patient capital by increasing market information asymmetry and decreasing stock liquidity.

(3) ESG rating divergence has a more significant reduction influence on patient capital for non-state-owned enterprises and companies with poor ESG information disclosure quality.

Policy Recommendations:

(1) Strengthen the regulation and standardization of ESG rating agencies: Given the potential impact of ESG rating divergence on patient capital, regulatory authorities should enhance the oversight of rating agencies to ensure the transparency and fairness of the rating process. Additionally, efforts should be made to establish unified ESG rating standards to reduce rating divergence, thereby reducing market information asymmetry, bolstering investor confidence, and attracting more patient capital into the market.

(2) Improve the quality of corporate information disclosure: Companies should enhance the quality and transparency of their information disclosure, especially for non-state-owned enterprises and those with poor ESG information disclosure quality. This will help reduce information asymmetry, increase stock liquidity, and thus attract and maintain the investment of patient capital.

(3) Encourage a long-term investment-oriented capital market environment: Policymakers should use incentives such as tax benefits and investment protection to encourage institutional investors to engage in long-term investments. At the

same time, a market mechanism conducive to long-term investment should be established and improved, providing more protection and incentives for long-term investors, promoting the formation and growth of patient capital, and supporting high-quality economic development.

COMPETING INTERESTS

The authors have no relevant financial or non-financial interests to disclose.

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