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# A Study of the Impact of Corporate ESG Rating Divergence on Short-Term Lending and Long-Term Investment Behavior

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**Abstract: In recent years, ESG performance has become an important indicator for assessing corporate sustainability, but the differences in the systems of different rating agencies lead to divergence in the rating results for the same company, which may affect corporate financial decisions. Using a sample of Chinese A-share listed companies from 2015-2023, this paper explores the impact and mechanism of ESG rating divergence on firms' short-term lending and long-term investment behaviors. It is found that ESG rating disagreement significantly exacerbates firms' short-lending and long-investing behaviors, and this phenomenon is more prominent among large-scale firms, firms in the eastern region, and firms with high competitive market positions. The mechanism analysis shows that ESG rating disagreement strengthens firms' tendency to short-term lending and long-term investment through three paths: reputational risk, information asymmetry, and operational risk. Specifically, rating divergence damages corporate reputation and increases financing costs; exacerbates information asymmetry and pushes up the cost of debt monitoring; and amplifies operational risks, forcing firms to rely on short-term debt to maintain liquidity. This study provides an important reference for policy makers to improve the ESG rating system, for firms to optimize their debt structure, and for investors to assess their risks, and it also provides a new theoretical basis for understanding the economic consequences of ESG rating divergence.**

**Keywords: ESG Rating Divergence; Short-Term Lending and Long-Term Investment; Information Asymmetry; Reputational Risk; Operational Risk**

## 1.Introduction

In recent years, the concept of sustainable development has become a global consensus and has occupied a central position in the policy agendas of various countries. As a responsible developing country, China has implemented a series of strategically important policy initiatives to promote the construction of an ecological civilization and sustainable development." The Outline of the Fourteenth Five-Year Plan for the National Economic and Social Development of the People's Republic of China and the Visionary Goals for the Year 2035", which was promulgated in 2021, explicitly proposes "building a modern energy system. The Outline of the Fourteenth Five-Year Plan and Vision 2035 for National Economic and Social Development of the People's Republic of China, issued in 2021, explicitly proposed to "build a modern energy system" and focus on the development of non-fossil energy, with the goal of increasing the proportion of non-fossil energy consumption to around 20% by 2025, which marks the beginning of the systematic construction of the world's largest clean energy system. At the same time, the Chinese government has solemnly committed to the "dual-carbon" strategic goal of "realizing carbon peak by 2030 and carbon neutrality by 2060", reflecting the role of a great nation. In 2023, the CPC Central Committee and the State Council jointly issued the "Opinions on Comprehensively Promoting the Construction of a Beautiful China", which innovatively promotes the development of non-fossil energy. In 2023, the Opinions on Comprehensively Promoting the Construction of a Beautiful China, jointly issued by the CPC Central Committee and the State Council, innovatively proposed "exploring the development of Environmental, Social and Corporate Governance (ESG) evaluation" and incorporated it into the safeguard system for the construction of a beautiful China, which not only conforms to the new trend of the global governance of sustainable development, but also provides systematic guidance for the green transformation of enterprises. In this context, the

ESG performance of enterprises has gradually become an important yardstick for measuring their sustainable development capability, and a key observation indicator for the effectiveness of policy implementation [5].

ESG, or Environmental, Social and Governance, is essential non-financial information and a globally popular indicator nowadays for evaluating the sustainability of enterprises (2022). ESG has been surging rapidly in recent years in China, and academicians have analyzed it from all sides. Hypothetically, ESG performance of enterprises can compensate for the asymmetry between enterprises and investors (Yin et al., 2024), alleviate the financing constraint, and thus promote enterprise green technological innovation; it has a powerful positive function in corporate value, and the stronger the internal control quality is, the stronger the driving force is; meanwhile, superior ESG performance can also effectively hedge the risk of enterprises [14]. Although ESG performance has a multi-dimensional positive role in the sustainable development of enterprises, heterogeneity of ESG grades has become the essential bottleneck restricting it from being applied in practice. ESG rating agencies in fashion nowadays utilize different indicator systems, weight settings and information sources, so the same enterprise is normally assigned vastly different evaluation results (Burke, 2021) [3].

Because of various factors like the lag of the standardization process of non-financial information evaluation behind the market demand, the reality of systematic heterogeneity in evaluation methods, and the imperfect theoretical model of sustainable development, ESG scores of the same enterprise from varied institutions can diverge from one another. This rating difference will impact the investment behavior and financing behavior of corporations in a systematic manner via the information transmission channel of financing constraint channels: that is, ESG rating difference will amplify the information asymmetry of the capital market (Ma et al., 2024) [11], so that it is hard for suppliers of short-term capital, like commercial banking financial institutes, to estimate the environmental and social risk of corporations accurately, and hence tends to shorten the At the same time, rating difference will undermine the market signaling role of the performance of ESG (Berg et al., 2022), so that those enterprises investing heavily in ESG can still experience financial constraint, etc., and hence must adopt the strategy of the financing behavior of "short-term loan, long-term investment" for maintaining long-term investment in green projects. Although this type of maturity mismatch can meet the financial demand of enterprises in the short term [2].

m. it will notably enlarge their liquidity risk (Almeida et al., 2011), and can bring about a whole chain of ill effects [1]. For example, increased costs of financial distress and decreased investment efficiency, which will eventually limit the capability of enterprises to develop in a sustainable way.

Faced with this, we endeavor to investigate the role of corporate ESG rating divergence in the behavior of short-lending and long-investment as well as its action mechanism. According to the data of Chinese A-share listed firms during the period 2015-2023, this article experimentally studies the role of ESG rating divergence in contributing to the proportion of firms' short-lending as well as long-investing behavior. It is discovered that the proportion of corporate ESG rating divergence has played a crucial role in facilitating firms' behavior of short-lending and long-investment, and this role is greater in the large-scale firms, eastern firms, as well as firms with high competitive positions in the market. Additionally, ESG rating disagreement strengthens the proportion of short-term loan as well as long-term investment behavior by enhancing firms' reputational risk, the severity of the degree of information asymmetry between firms as well as the investor, as well as operational risk.

## 2.Literature Review

### 2.1 Corporate ESG Rating Divergence

ESG rating discrepancy, as a new research hotspot in the past few years, focuses on investigating the phenomenon of large gaps in the evaluation of ESG performance of the same company by various rating institutions as well as their economic implications. Previous research has revealed that this kind of discrepancy is mainly caused by three major factors: first, the non-consistency of the rating indicator system, which has obvious gaps in the choosing of indicators of the environmental, social, and governance dimensions between various agencies (Berg et al., 2022) [2]; and second, the

heterogeneity in the weight allocation, with different standards for the evaluation of the weight of ESG dimensions by various agencies (Zhang Yunqi et al., 2023); third, it is the variety of data sources, including various channels like self-reporting of firms, third-party databases, as well as media information (Zhou Zejiang et al., 2023) [29]. These systematic gaps cause the conclusion that ESG assessments of the same company may yield largely different outcomes, which further trigger various market effects.

From the perspective of information effect, ESG rating discrepancy can seriously enlarge the extent of information asymmetry in the capital market (MA et al., 2024), and when different organizations give largely divergent assessments of the environmental performance of a company or corporate governance of a company, it is difficult for investors to objectively evaluate the true sustainability capability of a company, and this information noise reduces the pricing efficiency of the market (Liu Xiangqiang et al., 2023) [21]. The information noise reduces the pricing efficiency of the market. From the perspective of financing costs, rating discrepancy can dilute the signaling role of ESG performance (Zhang Yunqi et al., 2023), which makes even those companies that actually pay attention to sustainability face financing constraints and need to turn to more costly short-term financing channels [27]. Noticeable is the fact that the latest research has come to pay attention to the mechanism of the impact of rating disagreement on firms' specific financing decisions, finding that supplier ESG rating disagreement expands the operational risk of purchase-holding firms by supply chain transmission, and proving the incentive role of rating disagreement in firms' voluntary disclosure behavior (He Taoming et al., 2023) [19]. Such research provides important foundation for microeconomic implications of ESG rating discrepancy, but for the issue of impact of ESG rating discrepancy on the important financial decision of firms' debt maturity structure, there is relatively less research to address it.

### 2.2 Debt Maturity and Short-Term Lending

As a classic topic in the field of corporate finance, the study of debt maturity structure choice has formed a relatively well-developed theoretical system. Traditional theories mainly explain the debt maturity choice of enterprises from the contract cost perspective (Diamond, 1991) and signaling perspective (Flannery, 1986) [8,9]. In China's special institutional context, short-term lending and long-term investment (i.e., using short-term debt financing to support long-term asset investment) has become a financial phenomenon worthy of attention. A pioneering study has constructed a measure of short-term loans and long-term investments, which is defined as the difference between the ratio of short-term liabilities to total liabilities minus the ratio of short-term assets to total assets (Liu Xiaoguang & Liu Yuanchun, 2019) and this approach is able to effectively capture the extent of the mismatch between firms' debt maturities and asset maturities [22].

Subsequent studies have explored the causes of short-term lending and long-term investment from multiple dimensions. The financing constraint theory suggests that firms are forced to rely on short-term debt roll financing to support long-term investment when they face credit discrimination or information asymmetry (Zhu, 2023); the agency cost theory states that management may actively adopt an aggressive debt maturity structure in pursuit of short-term performance (Cai, 2024) [4]; and the institutional environment theory emphasizes the key role of macro factors such as financial disincentives and interest rate regulation (Zhou Zejiang et al., 2024) [30]. It is worth noting that in recent years, studies have begun to focus on the impact of non-financial factors on debt maturity structure, finding that corporate ESG performance can optimize debt maturity structure by alleviating financing constraints, but the important dimension of ESG rating divergence has not yet been incorporated into the analytical framework. This research gap has important theoretical value because ESG rating divergence may affect creditors' maturity decisions by altering the information environment and risk expectations, which in turn leads to systematic changes in firms' debt maturity structure.

## 3.Theoretical Hypothesis

ESG rating disagreement, as a manifestation of inconsistency in the assessment of firms' non-financial information, may affect firms' financing decisions, especially the choice of debt maturity structure, through a variety of channels (Wu Hsih-chung et al., 2024) [25]. The impact of ESG rating disagreement on firms' financing

decisions can be explained in depth from two dimensions, namely, signaling theory and information asymmetry theory. In the capital market, a firm's ESG performance, as an important non-financial signal, directly affects the decision-making behavior of creditors and investors (Berg et al., 2022). However, the credibility of such signals is seriously undermined when different rating agencies give significantly different ratings on the ESG performance of the same firm (Chu & Finance, 2017) [6]. Rating divergence makes it difficult for the market to form a consensus on the sustainability capabilities of firms, which in turn exacerbates the information asymmetry between firms and external investors (Jiang Yonghong & Nian Xueyu, 2025) [20]. This deterioration of the information environment can trigger two negative effects: on the one hand, the increase in potential creditors' risk assessment of enterprises creates discrepancies and raises the risk premium for loans to enterprises, which leads to an increase in the cost of corporate financing to the extent that they tend to shorten the term of their debt in order to avoid the potential risks (Strong Power Decree et al., 2024) [23]; on the other hand, the aggravation of the asymmetry of information will also increase the corporate financing costs, especially the difficulty of financing long-term debt rises significantly (Deng, 2023) [7]. As a result, firms may be forced to rely on short-term debt financing to support long-term investments, thus exacerbating short-term lending and long-term investment behavior.

Based on the theory of reputational capital, rating divergence of ESG performance, as a core dimension of corporate reputational capital, will have a systematic impact on corporate financing activities through a triple transmission mechanism: first, the signaling disruption effect will distort the market's accurate assessment of a firm's sustainability capability Christensen. Second, the credibility discounting effect will trigger stakeholders to question the authenticity of corporate ESG disclosures, and finally, the regulatory attention effect may lead to more stringent external scrutiny (Grewal et al., 2020) [10]. This multidimensional depletion of reputational capital can significantly reconfigure firms' financing constraints. Specifically, creditors respond to ESG information uncertainty by establishing a dynamic reputation assessment framework, a mechanism under which long-term debt markets exhibit greater sensitivity to ESG rating divergence (Sufi, 2007) [12]. This structural change in the financing environment has prompted firms to strategically adjust their debt maturity structure, which in information-sensitive industries is often characterized by a significant increase in the phenomenon of "short-term lending and long-term investment" (Tan & Zhu, 2022) [13].

Discrepancies in ESG ratings significantly increase the business risk of enterprises through information uncertainty and market perception differences, which in turn prompts them to adopt the financing strategy of "short-term lending and long-term investment", and ultimately exacerbates the risk of financial mismatch. According to the theory of information economics, when rating agencies disagree significantly on the environmental, social, and governance performance of firms, this inconsistency amplifies the cognitive differences among market participants, making it difficult for investors to accurately assess the long-term sustainability of firms Berg. This uncertainty in the information environment translates directly into a rise in business risk, which is manifested in the form of tighter financing constraints, higher cost of capital, and increased share price volatility. In the face of heightened risk, corporate management tends to prefer short-term debt financing based on agency theory and a tendency toward financial conservatism in order to maintain a high degree of financial flexibility. However, the frequent rollover demand of short-term debt and the investment return cycle of long-term assets form a structural contradiction, leading to the phenomenon of "short-term loans and long-term investments". Accordingly, this paper proposes the hypothesis that the divergence of corporate ESG ratings can increase the degree of short-term lending and long-term investment.

## 4.Research Design

### 4.1 Model Specification

$$SFLI=\beta_0+\beta_1 ESGdif+\gamma X'_{i,t}+Year+ID+\varepsilon \quad (1)$$

Where SFLI is firms' short loan and long investment, ESGdif is ESG rating divergence, X, t' denotes some of the above columns of control variables, Year and ID are year and firm fixed effects, respectively, and ε denotes the random perturbation term. In order to eliminate potential heterogeneity and autocorrelation problems at

the firm level, this paper uses robust standard errors clustered to the firm level.

### 4.2 Variable Measurement

4.2.1 Dependent variables

Referring to the practice of Liu Xiaoguang and Liu Yuanchun(2019), the difference between the ratio of short-term liabilities to total liabilities and the ratio of short-term assets to total assets is used as a measure of the degree of short-term lending and long-term investment of the enterprise (Liu Xiaoguang & Liu Yuanchun, 2019), which reflects the degree of match between the maturity structure of the enterprise's debt and the maturity structure of its assets, and the greater the value of the indicator is, the greater the degree of short-term lending and long-term investment of the enterprise is.

$$SFLI=\frac{STD}{TD}-\frac{STA}{TA} \quad (2)$$

4.2.2 Independent variable

In this paper, we draw on the practice of Tai-Ming Ho et al. (2023) and use ESG data from six rating agencies, namely, CSI, WIND, Shangdao Rongguo, Allied Wave, Runling Global and FTSE Russell, to uniformly assign the six ESG ratings data to ensure comparable weights, and calculate the standard deviation of the assigned six ESG ratings data (He Taoming et al., 2023) as the divergence of ESG ratings. measurement variable.

4.2.3 Control variables

In order to eliminate the interference of other factors, this paper further controls for firm size (Size), gearing ratio (Lev), net profit margin on total assets (ROA), cashflow ratio (Cashflow), growth rate of operating income (Growth), shareholding of the first largest shareholder (Top1)

4.2.4Mediating variables

(1) Reputation risk. This paper refers to the method of Guan Kaolei and Zhang Rui, using 12 corporate reputation evaluation indexes and factor analysis of these 12 indexes to calculate the corporate reputation score, and then according to the corporate reputation score from low to high is divided into 10 groups, and each group is assigned a value of 1 to 10 in turn(Guan Kailei Zhang Rui 2019) [17].

(2) Information asymmetry. In this paper, we refer to the methodology of Yu Wei (2012) and construct three indicators to measure the degree of information asymmetry based on daily frequency trading data. Specifically, the liquidity ratio (the ratio of daily stock return to the square root of turnover), the illiquidity ratio (the ratio of the absolute value of daily return to the square root of turnover), and the yield inversion indicator (analyzing the inversion effect of the excess return on the previous trading day's turnover through the regression model, and the worse the liquidity is, the stronger the inversion effect is) are used to synthesize the three standardized indicators into the ASY composite indicator (Yu Wei et al., 2012), the larger the value, the higher the degree of information asymmetry [26].

(3) Operational risk. The higher the company's operational risk, the higher the earnings volatility. In this paper, we refer to Wang Zhuquan et al. (2017) and use the degree of volatility of the firm's earnings to measure the magnitude of operational risk (Wang Zhuquan et al., 2017) [24], which is calculated by the formula:

$$\delta_{i,t}=\sqrt{\frac{1}{T-1}\sum_{t=1}^{T}(E_{i,t}-\frac{1}{T}\sum_{t=1}^{T}E_{i,t})^2}\quad T=4 \quad (3)$$

$$E_{i,t}=\frac{EBIT_{i,t}}{A_{i,t-1}} \quad (4)$$

Where $\delta_{i,t}$ represents the operating risk (degree of earnings volatility) of company i in year t; $EBIT_{i,t}$ -EBITDA i of company i in year t; $A_{i,t-1}$ -total assets of company i in year t-1 (four years). Since the operational risk calculated in this way does not obey a normal distribution, the probability distribution of the standard deviation of EBITDA, which represents the operational risk, was continued to be calculated and used as a measure of operational risk.

**Table 1. Definition of Main Variables**

| Variable Type | Variable Name | Variable Symbol | Variable Definition |
|---|---|---|---|
| Explained variable | Short-term lending and long-term investment | SFLI | The difference between the ratio of short-term debt (short-term debt/total debt) and the ratio of short-term assets (short-term assets/total assets) |
| Explanatory variable | ESG rating divergence | ESGdif | Standard deviation of six ESG rating datasets |
| Control variables | Firm Size | Size | Natural logarithm of total assets at year-end |
| | Leverage | Lev | Leverage |

| | | | |
|---|---|---|---|
| | ROA | ROA | ROA |
| | Cash Flow Ratio | Cashflow | Operating cash flow to total assets ratio |
| | Revenue Growth | Growth | Revenue growth |
| | Largest Shareholder | Top1 | Ownership concentration index (1/100) |
| | Reputation Risk | REP | Reputation risk |

### 4.3 Data Sources

Construct the annual dataset of listed companies based on the database of Cathay Pacific (CSMAR). At present, many ESG rating systems appear at home and abroad, which have their own characteristics in terms of rating criteria, reference indicators and coverage. In this paper, we select Sino-Securities ESG Index, WIND, SynTao Green Finance, MSCI China ESG Research, Rankins ESG Ratings, FTSE Russell, which provide ratings on specific ESG dimensions and reflect the ESG performance of suppliers in a more comprehensive way. Considering the yearly limitation of data available for ESG ratings in each rating agency, the sample period is selected as 2015-2023 in this paper. Other variables at the firm level are derived from the CSMAR database.

Based on the original data, this paper makes the following treatments: ① proposes samples of enterprises categorized as ST* and ST categories: ② proposes samples with important variables seriously missing; ③ excludes samples rated by only 1 ESG agency. Finally, this paper constructs a data dataset of 32,173 data for 5,000 enterprises from 2015 to 2023. In order to avoid the influence of extreme values, this paper does the shrinking of continuous variables with upper and lower 1%.

## 5.Empirical Analysis

### 5.1 Descriptive Statistics

Table 2 shows the descriptive statistics of the main variables. The mean value of short loan long investment (SFLI) is -0.105, the median is -0.074, and the standard deviation is 0.202, but 79.16% of the firms had at least one year of the behavior, indicating that most of the firms will rely on SFLI in stages, and that the phenomenon of SFLI is prevalent among Chinese A-share listed companies. The mean value of corporate ESG rating divergence (ESGdif) is 0.909, the median is 0.850, and the standard deviation is 0.780, indicating that the overall level of ESG rating divergence of the sample is in the middle of the range, and there are large variations among enterprises. Among the control variables, the mean value of enterprise size (Size) is 22.301, and the standard deviation is 1.329, indicating that the sample in this paper covers enterprises of different sizes; the mean value of net profit margin of total assets (ROA) is 0.037, the maximum value is 1.285, and the minimum value is -1.324, indicating that the net profit margin of total assets is in the range of reasonable values. The statistical results of the variables are basically consistent with the existing literature.

**Table 2. Descriptive Statistics**

| Variable Type | Variable Name | N | Mean | Median | Std. Dev. | Min | Max |
|---|---|---|---|---|---|---|---|
| Explained variable | Short-term lending and long-term investment | 30435 | -0.105 | -0.074 | 0.202 | -1.101 | 0.275 |
| Explanatory variable | ESG rating divergence | 32173 | 0.909 | 0.850 | 0.780 | 0 | 2.758 |
| Control variables | Firm Size | 32170 | 22.301 | 22.092 | 1.329 | 17.641 | 28.697 |
| | Leverage | 32170 | 0.413 | 0.402 | 0.207 | 0.008 | 1.957 |
| | ROA | 32169 | 0.037 | 0.038 | 0.082 | -1.324 | 1.285 |
| | Cash Flow Ratio | 32170 | 0.048 | 0.047 | 0.074 | -0.744 | 0.876 |
| | Revenue Growth | 32163 | 0.245 | 0.088 | 3.719 | -1.445 | 429.036 |
| | Largest Shareholder | 32170 | 0.331 | 0.307 | 0.148 | 0.003 | 0.900 |

### 5.2 Baseline Regression Results

Table 3 presents the results of the benchmark regressions on the relationship between ESG rating divergence and short loans and long investments. In column (1), controlling for the double fixed effects of firm and vintage but adding no other control variables, the coefficient on SFLI is 0.007 and is significantly positive at the 1% level. In column (2), with the inclusion of the control variables, the coefficient on the SFLI remains 0.007 and is significantly positive

at the 1% level. The consistency of these results suggests that ESG rating divergence drives firms' short lending and long investing behavior.

**Table 3. ESG Rating Divergence and Short Loans and Long Investments**

| | (1) | (2) |
|---|---|---|
| | nocontrol | control |
| VARIABLES | STLI | STLI |
| | | |
| ESGdif6 | 0.007*** | 0.007*** |
| | (0.002) | (0.002) |
| Size | | -0.084*** |
| | | (0.004) |
| Lev | | 0.109*** |
| | | (0.017) |
| ROA | | -0.925*** |
| | | (0.034) |
| Cashflow | | -0.818*** |
| | | (0.022) |
| Growth | | -0.001*** |
| | | (0.000) |
| Top1 | | -0.035 |
| | | (0.028) |
| Constant | -0.111*** | 1.799*** |
| | (0.002) | (0.097) |
| | | |
| Observations | 30,119 | 30,111 |
| R-squared | 0.246 | 0.444 |

Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1,the following tables are identical

### 5.3. Robustness Checks

5.3.1. Alternative measures of independent variables

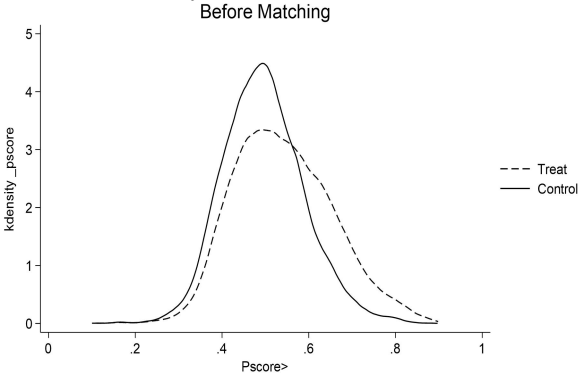
Referring to the measure of Yuting Feng et al, the robustness test is conducted by replacing the measure of independent variables(Zhu, 2023; Feng Yuting et al., 2024) [15,16]. Specifically, this paper uses the standardized coefficient of variation of the rating scores of the six rating agencies to measure ESG rating divergence (ESGCV_a). The regression results in column (1) of Table 4 show that the coefficient of ESGCV_a is 0.023, which is significantly positive at the 1% level, indicating that ESG rating divergence promotes firms' short-lending and long-investment behaviors, which is consistent with the benchmark regression results. In addition, the ESG rating scores of rating agency Runling Global are reduced and the standard deviation of the standardized rating scores of the five rating agencies is used to measure ESG rating divergence (ESGdif5_b). The regression results in column (2) show that the coefficient of ESGdif5_b is 0.006, which is significantly positive at the 1% level, further validating the findings.

5.3.2. Exclusion of outlier years

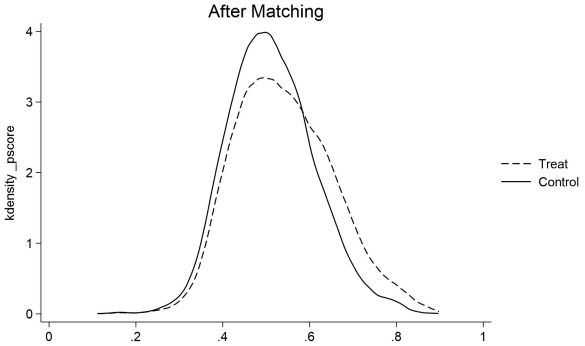
Due to the short application time of ESG indicators in China, the impact of ESG rating divergence on short-term lending and long-term investment may be disturbed by very short periods of time, such as the stock market crash in 2015 and the new crown epidemic in 2022. Therefore, this paper re-runs the regression after excluding the sample data in 2015 and 2022, and the results are shown in column (3) in Table 4, where the regression coefficients of ESGdif6 are significantly positive at the 10% level, indicating that the results are still robust after narrowing the sample interval.

5.3.3. Propensity score matching (PSM) method

To address the endogeneity problem caused by sample selection bias and differences in control variables, this paper uses the propensity score matching (PSM) method to further validate the findings. In this paper, we refer to the study of Guowenting et al. (2024), which utilized the median standard deviation of ESG rating divergence as the division criterion to divide the sample into high divergence group (assigned a value of 1) and low divergence group (assigned a value of 0) . Using all control variables as covariates, a 1:2 nearest-neighbor matching was performed between the high- and low-divergence groups (Guo Wenting & Li Yunhe, 2024) [18]. Figure 1(a) illustrates the kernel density distribution between groups before and after PSM matching. Before matching, the probability distributions between the groups differed greatly; after PSM matching, the probability distributions between the groups obviously converged, so the matching effect was more satisfactory.




**(a) Before Matching**




**(b) After Matching**

**Figure 1. PSM Matches the Kernel Density Distribution between Groups Before and After**

Column 4 of Table 1(b) shows the regression results after PSM matching, and the coefficient of bar ESGdif6 is 0.006, which is significantly negative at the 1% level; this result indicates that the findings still hold after controlling for the sample selection bias and the check of control variables.

## 6. Further Analysis

### 6.1 Mechanism Testing

6.1.1 Reputational risk mechanisms

Reputation is an intangible asset of a firm and is critical to its sustainable development and market performance. As consumers and investors attach increasing importance to CSR, ESG performance has an increasing impact on corporate reputation (Zhao Yunhui et al., 2024) [28]. When corporate ESG ratings diverge, it signals to the market uncertainty about a firm's sustainability ability, triggering negative evaluations from the media and stakeholders. This reputational damage not only increases firms' financing costs, but also forces firms to rely on short-term debt to alleviate liquidity pressures, thus exacerbating short-term lending and long-term investment. Specifically, when different rating agencies give widely varying evaluations of an enterprise's ESG performance, investors and creditors will question the enterprise's true fulfillment of its environmental and social responsibilities, and thus raise the risk premium or tighten financing terms. Under such circumstances, enterprises are forced to turn to shorter-term and higher-cost financing channels in order to maintain normal operations, leading to a further deterioration of the debt maturity structure and the formation of a vicious cycle of "short-term lending and long-term investment".

This regression result is shown in column (1) of Table 4, where the coefficient of ESGdif is -0.023, which is significantly negative at the 10% level. This result suggests that, i.e., the greater the divergence in ESG ratings, the lower the corporate reputation score, indicating that when the market receives inconsistent ESG signals, it can materially damage corporate reputation, weakening the ability of firms to cope with market changes and uncertainty, which in turn facilitates short-lending and long-lasting behavior.

6.1.2 Information asymmetry mechanism

Disagreement in ESG ratings can exacerbate information asymmetry between enterprises and investors and creditors, significantly increasing the cost of ex post monitoring of debt financing. When there are significant differences in the evaluation of ESG performance of the same enterprise by different rating agencies, it is difficult for the market to accurately assess the enterprise's true sustainability and risk level, leading to the deterioration of the information environment. Specifically, on the one hand, rating divergence creates signal confusion, forcing creditors to invest more resources in verifying the authenticity of ESG data; on the other hand, rating divergence triggers the market's misgivings about the "greenwashing" behavior of enterprises, which increases the prudence of credit decision-making.

Column (2) of Table 4 shows that the coefficient of ESG rating divergence is -0.008 and significant at the 5% level, indicating that the higher the rating divergence, the lower the information transparency of firms. This deterioration in the information environment directly leads creditors to adopt risk-averse behaviors, including shortening debt maturities and raising interest rates, which ultimately forces firms to rely on short-term financing and exacerbates the problem of "short-term lending and long-term investment".

6.1.3 Operational risk mechanism

ESG rating divergence can exacerbate corporate operational risk, which in turn reinforces the tendency of corporations to lend short and invest long. As the importance of ESG factors in corporate business decisions continues to rise, rating divergence can send negative signals to the market about the stability and sustainability of corporate operations. When there are significant differences in different rating agencies' assessment of an enterprise's ESG performance, it will trigger investors' and

creditors' concerns about the enterprise's real business risks, and this uncertainty is directly reflected in the enterprise's financing conditions and operational decisions. Specifically, this risk transmission mechanism is manifested in the following ways: firstly, rating divergence will magnify the uncertainty of the enterprise's strategy execution, forcing the management to adopt more conservative financial policies; secondly, supply chain partners and customers may reassess the enterprise's ESG risk exposure, leading to an increase in operating costs and a decrease in market competitiveness; and lastly, the regulatory agencies may regard rating divergence as a signal of the enterprise's insufficient compliance capability, thus strengthening regulatory scrutiny. and thus intensify regulatory scrutiny. To cope with these operational risks, firms are forced to turn to short-term debt financing to maintain liquidity, but this choice further worsens the maturity structure of the firm's debt, creating a vicious cycle in which operational and financial risks reinforce each other.

**Table 4. Mechanism of Action Analysis**

| | SY | ASY | RISK |
|---|---|---|---|
| VARIABLES | SY | ASY | Risk |
| | | | |
| ESGdif6 | -0.023* | -0.008** | 0.002*** |
| | (0.013) | (0.003) | (0.001) |
| Size | 1.738*** | -0.259*** | 0.002 |
| | (0.020) | (0.005) | (0.001) |
| Lev | -0.071 | 0.139*** | 0.023*** |
| | (0.076) | (0.019) | (0.005) |
| ROA | 7.155*** | -0.436*** | 0.059*** |
| | (0.120) | (0.028) | (0.007) |
| Cashflow | 0.835*** | -0.337*** | -0.012* |
| | (0.116) | (0.029) | (0.007) |
| Growth | 0.005*** | 0.001** | -0.002*** |
| | (0.002) | (0.000) | (0.000) |
| Top1 | -0.078 | 0.671*** | 0.029*** |
| | (0.136) | (0.036) | (0.008) |
| Constant | -33.638*** | 5.251*** | -0.015 |
| | (0.443) | (0.113) | (0.028) |
| | | | |
| Observations | 26,242 | 31,894 | 21,561 |
| R-squared | 0.905 | 0.753 | 0.509 |

The results in column (3) of Table 4 show that the coefficient of ESGdif on operational risk is 0.002 and significant at the 1% level, indicating that the higher the rating divergence, the higher the operational risk of the firms, which in turn promotes the firms' behavior of short-term lending and long-term investment.

### 6.2 Heterogeneity Test

Firms' own attributes, location and industry differences may have an impact on the research results. In order to explore the impact of these factors in depth, this paper analyzes the heterogeneity of firms in terms of their size, geographic location, and competitive position in the market, respectively.

6.2.1 Heterogeneity analysis of size

The sample firms are categorized into large-scale and small-scale based on the mean value of firm size within the same industry in the same year in order to explore the effect of firm size on the relationship between ESG rating divergence and short-term lending and long-term investment. The regression results in columns (1) and (2) of Table 5 show that large-scale firms' short-lending and long-investing behaviors are more susceptible to ESG rating divergence, while the sensitivity of small-scale firms is weaker and insignificant. This may be due to the fact that large-scale firms usually face stronger market scrutiny and investor attention, and ESG rating divergence may reflect information asymmetry or strategic disputes, leading firms to rely more on short-term financing to adjust their long-term investment strategies. In addition, large-scale firms are able to withstand the refinancing risk of short-term debt by virtue of stable cash flows and credit reserves, and are more likely to proactively utilize short-term lending and surrender to low costs. In contrast, small-scale enterprises with low ESG concern, more reliance on traditional financial indicators for financing decisions, and their weak risk resistance, even if ESG disagreement exists, will prioritize avoiding short-term lending and long-term investment behaviors to avoid capital chain breaks.

6.2.2 Heterogeneity analysis of region

The impact of ESG rating divergence on firms' short-term lending and long-term investment may show significant differences across regions due to large differences in regulatory levels and regulatory environments in different regions. This paper explores the heterogeneous impact of firms' geographic location on the results by categorizing firms into eastern and western regions based on their geographic location. The regression results in columns (3) and (4) of Table 5 indicate that firms' short-lending and long-investing behaviors are more likely to be

affected by ESG rating divergence in eastern regions compared to non-eastern regions. The reason may lie in the fact that, with strict ESG regulation and high investor attention in the eastern region, rating divergence is prone to push up the cost of financing, forcing firms to rely on short-term debt rolling financing. On the other hand, in the western region, policy enforcement is more relaxed, and the impact of ESG factors on financing constraints is limited. At the same time, enterprises in the western region rely on policy loans for a long time and have poor cash flow stability, so they actively avoid the possible risks of short-term loans and long-term investment.

6.2.3 Heterogeneity analysis of market competitive position

As an effective external governance mechanism, market competitive position will directly affect corporate disclosure, so under different market competitive positions, ESG rating divergence will produce some heterogeneity in short-term lending and long-term investment in enterprises (Zhou Zegui et al., 2023). In this paper, the Lerner index PCM is used to measure the market competitive position of listed companies, and a larger PCM indicates a higher market competitive position. The regression results by median market competitive position are shown in the results of columns (5) and (6) of Table 5, which indicate that the short-lending and long-term investment behaviors of firms with high competitive position are more likely to be affected by ESG rating divergence. The reason may be that, according to the performance pressure effect, high competitive position firms tend to adopt more aggressive financial strategies to maintain their market dominance. When ESG ratings diverge, such firms are more inclined to support long-term investments through short-term financing in order to quickly adjust their strategic layout, leading to an intensification of short-term lending and long-term investment behavior. On the other hand, based on the proprietary cost effect, high competitive position firms may selectively disclose ESG information and reduce transparency in order to avoid leaking core information. This information asymmetry pushes up the cost of external financing, forcing firms to turn to more flexible but riskier short-term debt instruments. In contrast, low-competitive-position firms face weaker performance pressure and proprietary information protection needs, and the impact of ESG rating divergence on their financing strategies is relatively limited.

**Table 5. Heterogeneity Analysis**

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | nostate | state | noeast | east | low_PCM | high_PCM |
| VARIABLES | STLI | STLI | STLI | STLI | STLI | STLI |
| | | | | | | |
| ESGdif6 | 0.003 | 0.009*** | 0.004 | 0.007*** | 0.002 | 0.014*** |
| | (0.003) | (0.003) | (0.004) | (0.002) | (0.003) | (0.004) |
| Size | -0.101*** | -0.063*** | -0.076*** | -0.084*** | -0.071*** | -0.144*** |
| | (0.008) | (0.008) | (0.006) | (0.004) | (0.004) | (0.006) |
| Lev | 0.124*** | 0.120*** | 0.082*** | 0.127*** | 0.066*** | 0.286*** |
| | (0.021) | (0.030) | (0.021) | (0.014) | (0.014) | (0.024) |
| ROA | -0.863*** | -1.069*** | -0.958*** | -0.902*** | -0.765*** | -1.083*** |
| | (0.030) | (0.043) | (0.035) | (0.020) | (0.020) | (0.037) |
| Cashflow | -0.819*** | -0.841*** | -0.837*** | -0.812*** | -0.771*** | -0.806*** |
| | (0.026) | (0.032) | (0.032) | (0.021) | (0.021) | (0.033) |
| Growth | -0.007*** | -0.005*** | -0.013*** | -0.005*** | -0.005*** | -0.009*** |
| | (0.002) | (0.002) | (0.001) | (0.000) | (0.000) | (0.001) |
| Top1 | 0.102*** | -0.124*** | -0.088** | 0.006 | -0.058** | 0.033 |
| | (0.037) | (0.045) | (0.037) | (0.026) | (0.026) | (0.041) |
| Constant | 2.063*** | 1.408*** | 1.667*** | 1.777*** | 1.549*** | 3.066*** |
| | (0.164) | (0.176) | (0.124) | (0.086) | (0.087) | (0.143) |
| | | | | | | |
| Observations | 15,468 | 14,205 | 8,298 | 21,784 | 15,269 | 13,893 |
| R-squared | 0.496 | 0.461 | 0.478 | 0.451 | 0.475 | 0.475 |

## 8. Conclusions and Implications

This paper empirically examines the impact of ESG rating divergence on firms' short-lending and long-investment behaviors and its internal mechanism using Chinese A-share listed companies from 2015-2023 as the research sample. The findings show that: ① ESG rating divergence significantly exacerbates firms' short-lending and long-investing behaviors, a finding that is validated in both benchmark regressions and a variety of robustness tests. Specifically, when there are large differences in the ESG performance evaluations of firms by different rating agencies, the market's uncertainty about firms' sustainability rises, which in turn affects their financing decisions and prompts firms to rely more on short-term debt to support long-term investments. ② The analysis of the mechanism of action shows that ESG rating disagreement affects the short-term lending and long-term investment behavior of enterprises through three paths: first, the mechanism of reputational risk, i.e., rating disagreement damages the reputation of enterprises, raises the cost of financing, and forces enterprises to turn to short-term debt financing; second, the mechanism of information asymmetry, i.e., rating disagreement exacerbates the friction of information between enterprises and investors, increases the cost of debt monitoring, and leads to the shortening of the term of the debt by the creditors; Third, the mechanism of operational risk, i.e., rating disagreement amplifies the uncertainty of business operations, prompting firms to maintain liquidity through short-term lending and long-term investment. (iii) Heterogeneity analysis finds that the impact of ESG rating divergence differs significantly across firms. Large-scale firms, firms in the eastern region, and firms with high competitive market positions are more sensitive to ESG rating divergence, which is mainly attributed to the differences in regulatory pressure, market attention, and competitive environments they face. Based on the above conclusions, The research in this paper provides important practical insights for policy makers, corporate managers and investors:

For policymakers: ① The standardization of ESG rating system should be promoted to reduce the information noise caused by inconsistent rating standards and enhance the market information efficiency. ② Regulators need to strengthen the monitoring of corporate debt maturity structure, especially for enterprises with large divergence in ESG ratings, to prevent the accumulation of financial risks due to short-term lending and long-term investment. (iii) Differentiated ESG disclosure guidelines can be formulated for enterprises in different regions and sizes, such as providing policy support for western regions or small and medium-sized enterprises (SMEs) to reduce the cost of their ESG practices.

For corporate managers: ① They should emphasize the consistency and transparency of ESG performance and proactively disclose high-quality ESG information to reduce the adverse impact of rating disagreements on financing costs. ② Optimize the debt maturity structure and avoid over-reliance on short-term debt to finance long-term assets in order to reduce financial risks. ③ Enterprises need to develop differentiated ESG strategies by combining their own scale, location and industry competition characteristics. For example, enterprises with a high competitive position can alleviate market doubts by enhancing the accuracy of ESG information disclosure.

For investors: ① When assessing the value of a company, they should pay full attention to the information asymmetry that may be brought about by ESG ratings divergence, and cautiously analyze the reasons behind the divergence and its impact on the long-term solvency of the company. ② Investors can take ESG rating divergence as one of the risk warning indicators, combined with other financial and non-financial information, to optimize investment decisions.

Although this paper provides new evidence for understanding the economic consequences of ESG rating divergence, it still has some limitations. The measurement of ESG rating divergence is mainly based on data from six domestic rating agencies, and in the future, more rating agency data can be introduced or textual analysis methods can be used to capture the extent of divergence more comprehensively. This paper does not fully consider the impact of macroeconomic cycles or industry heterogeneity on the findings, and the dynamic effects of ESG rating divergence in different economic environments or industries can be further explored in the future. Whether ESG rating

divergence affects firms' other financial decisions is also a direction worth exploring.

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