



The Impact of ESG Information Disclosure on the Financing Efficiency of Listed New Energy Companies

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Abstract. With the development of the "dual carbon" approach and the expansion of the global notion of sustainable development, disclosure of environmental, social, and corporate governance (ESG) information has steadily grown in importance as a gauge of an organization's capacity for sustainable development. Especially in the new energy industry, a capital-intensive, technology-driven strategic emerging industry, ESG performance may have a profound impact on its financing efficiency. This paper examines how finance efficiency is impacted by ESG information disclosure using data from China's A-share new energy listed companies from 2015 to 2023. The findings demonstrate that a high degree of ESG performance can greatly increase the effectiveness of corporate finance. In addition, this paper also explores whether ESG affects financing efficiency by reducing corporate financing constraints. High-level ESG companies' ESG scores have a more noticeable impact on increasing corporate finance efficiency, according to the heterogeneity test. In addition to adding to the empirical data supporting the effect of ESG on corporate financing efficiency, this study offers new energy firms a useful resource for capital structure optimization and ESG strategic management.

Keywords: Financing efficiency, Financing constraints.

1 Introduction

An essential metric for showcasing a company's operational circumstances and capacity for sustainable development is ESG (environment, society, and government). A revised version of the "Corporate Governance Guidelines for Listed Companies" was released in 2018 by the CSRC, which explicitly required listed companies to disclose ESG information. The "Non-Financial Reporting Directive" was issued by the EU in 2014, requiring big businesses to include ESG data in their external non-financial reports. Since then, ESG information disclosure has gradually become institutionalized. Currently, the financing of listed companies is mainly based on the financial information of the company. However, non-financial information will also have an impact on the judgment of corporate sustainable development.

Investors are paying close attention to the new energy industry's overall performance in the capital market due to the "dual carbon" strategy and green finance rules, which are the main drivers behind the economy's green transformation. As an enterprise with

great social impact, high technological barriers and capital intensiveness, the financing efficiency of the new energy industry is critical to the sustainable development of the enterprise.

This article focuses on the new energy industry and explores the role of ESG in the financing of new energy companies. In order to investigate the effect of ESG disclosure on the financing efficiency of listed companies in the new energy industry, as well as to confirm whether the action path of ESG is achieved by reducing financing constraints, this article selects the financial data of some listed companies in the new energy industry from 2015 to 2023 and the ESG scores in the CSMAR database.

2 Theoretical Mechanism and Research Hypothesis

2.1 Stakeholder Theory

The stakeholder theory was proposed by economist Feldman in 1994. According to the theory, any individual or group that could have or have an impact on the achievement of corporate goals is considered a stakeholder. In order to attain a comprehensive governance structure, it promotes that businesses should consider the interests of other stakeholders, such as the external market environment, in addition to the rights and interests of shareholder. A company's ESG performance displays financial information, meets stakeholders' multi-level and all-round information needs on the company's operating status, and reflects the company's emphasis on stakeholders [1]. Companies that prioritize stakeholder interests can enhance their reputation, build stronger relationships, and thereby gain important financing resources [2]. By improving management levels in the areas of environment, employee relations and diversity, and governance transparency (corresponding to the three levels of E, S, and G), and strengthening communication and collaboration with key stakeholders, companies can form a stable trust mechanism, improve the capital market's valuation of the company, and reduce risk premiums, thereby potentially improving corporate financing efficiency by enhancing capital acquisition capabilities [3].

In light of this, this study puts forth hypothesis H1: ESG disclosure can improve corporate financing efficiency.

2.2 Information Asymmetry Theory

Kim et al. used ESG performance data to conduct panel data analysis on a large number of US companies. The findings demonstrated that information asymmetry can be lessened by ESG performance [4]. and strengthen the constraints and supervision of management execution [5]. Compared with investors, enterprises are more aware of their financial status and sustainable development [6], and may conceal operational problems in order to obtain more financing amounts or greater financing possibilities. Investors may have a crisis of confidence in companies that do not disclose information in place. On the one hand, the decline in investment willingness leads to a decrease in the amount of corporate financing. On the other hand, investors may constrain management behavior by requiring listed companies to increase asset collateral or increase loan interest rates [7], resulting in higher corporate financing costs. Companies that disclose ESG

information, including indicators such as efficient environmental practices, social responsibility, and governance structure, can obtain external financing with lower equity because they effectively reduce the risk judgment of external investors on the uncertainty of the company's operating conditions [8]. Based on this, this article proposes Hypothesis H2 and Hypothesis H3.

Hypothesis H2: The better the corporate ESG performance, the lower the degree of financing constraints

Hypothesis H3: Corporate ESG disclosure improves financing efficiency by reducing the intermediary path of financing constraints.

3 Sample Selection and Data Sources

Data samples of new energy businesses registered between 2015 and 2023 on the Shanghai and Shenzhen A-share exchanges are chosen for this article. Since some companies do not disclose ESG rating information or have financial data gaps, this paper makes a preliminary selection of the data in the process of constructing the panel data, and only retains the new energy

3.1 Variable Setting

This paper uses ESG score (ESG) as the explanatory variable and adopts the ESG value score provided by the CSMAR database to quantify the ESG performance of enterprises. The ESG rating assigns a value of 0-100 to the ESG performance level of the rated entity. In order to avoid the existence of ESG rating results of 0, this paper uses $\ln(ESG+1)$ to quantify the ESG index; the enterprise financing efficiency (FinEff) is used as the explained variable, and the enterprise's real financing cost rate is used to gauge the financing efficiency. The indicator is measured in the form of interest-bearing liabilities and financial expenses $\pm$ exchange gains and losses. The lower the index is, the lower the marginal cost of capital used by the enterprise, which can in turn indicate higher financing efficiency. To investigate if corporate finance efficiency can be impacted by ESG performance by reducing their financing constraints, this paper introduces the SA index (financing constraints) proposed by Hadlock and Pierce as an intermediary variable to quantify financing constraints [9]. To reduce the random errors of the explained variables, this paper uses company size, profitability and debt-to-asset ratio as control variables. Company size (Size) is quantified by the enterprise's total assets expressed as a natural logarithm. The larger the market size of the enterprise, the more financing channels and financing amounts it may obtain. The ratio of net profit attributable to the parent firm to total assets is used to calculate profitability (ROA). The higher the ROA value, the stronger the stability of the enterprise, and the lower the corresponding financing risk. The ratio of the company's total liabilities to its total assets is known as the debt-to-asset ratio (Lev). A higher ratio of debt to assets suggests a greater dependence on debt financing., which is likely to raise the financing party's concerns about the business's operational risks and, consequently, the financing cost of the organization.

The specific information on the variables is shown in Table 1.

Table 1. Specific Information.

Variable Types	Variable Name	Variable Symbols	Variable explanation
Explained variable	Financing efficiency (actual financing cost rate)	FinEff	(Financial expenses $\pm$ exchange losses)/interest-bearing liabilities
Explanatory variables	ESG Ratings	ESG	$\text{Ln}(1+\text{ESG})$
Mediating variables	Financing constraints	SA	$\text{SA} = -0.737 \times \text{Size} + 0.043 \times \text{Size}^2 - 0.040 \times \text{Age}$
	Company size	Size	$\text{Ln}(\text{Total assets})$
Control variables	Profitability	ROA	Net income attributable to shareholder/Total assets
	Debt-to-asset ratio	Lev	Total Liabilities/Total Assets

3.2 Model Construction

To validate hypothesis H1, this paper defines the basic regression model as follows:

$$FinEff_{it} = \alpha_0 + \beta_1 \cdot ESG_{it} + \sum \gamma_k \cdot Controls_{kit} + \varepsilon_{it} \tag{1}$$

Mediating effect model: This model takes financing constraints (SA) as the dependent variable to test whether ESG performance significantly affects corporate financing constraints.

$$SA_{it} = \alpha_1 + \beta_2 \cdot ESG_{it} + \sum \gamma_k \cdot Controls_{kit} + \varepsilon_{it} \tag{2}$$

If ESG and financing constraints are introduced at the same time and the SA coefficient decreases significantly while the ESG coefficient decreases significantly, there may be a mediating effect.

$$FinEff_{it} = \alpha_2 + \beta_3 \cdot ESG_{it} + \delta \cdot SA_{it} + \sum \gamma_k \cdot Controls_{kit} + \varepsilon_{it} \tag{3}$$

4 Empirical Analysis

4.1 Regression Model Test

The test results of the benchmark regression are shown in Table 2. The first column of regression results shows the impact of corporate ESG ratings on corporate financing efficiency (actual financing cost rate). The regression coefficient of ESG ratings is -

0.051, which has a significant negative impact on the financing cost rate at the 10% level. Since this paper uses the financing cost rate to reversely measure financing efficiency, it can be derived that, the efficiency of corporate finance can be greatly enhanced by raising ESG rating scores, indicating that ESG ratings have a substantial beneficial influence on corporate financing efficiency. Hypothesis H1 is established.

This paper tests regression model 2 to see if ESG ratings impact corporate financing efficiency through financing constraints. The second column of regression results indicates that corporate ESG ratings have a negative regression coefficient, but it does not reach the statistical significance level for financing constraints. This result shows that the improvement of ESG rating scores cannot significantly reduce the degree of corporate financing constraints. Hypothesis H2 does not hold.

The third column of regression results incorporates ESG rating scores and the mediating variable financing constraints (SA) into the model to test the joint impact of ESG rating scores and financing constraints on financing efficiency, and at the same time test whether the intermediary variable path of financing constraints is established. The results show that after the introduction of the mediating variable SA, the impact of ESG ratings on financing efficiency is still significant. The regression coefficient of Sa is -0.036, but it does not reach the statistical significance level. This result shows that ESG does not affect corporate financing efficiency through the intermediary path of financing constraints, but directly affects corporate financing efficiency. Hypothesis H3 does not hold.

Table 2. Specific Information.

VARIABLES	(1) Fin Eff	(2) Sa	(3) Fin Eff
esg	-0.051* (0.030)	-0.028 (0.123)	-0.052* (0.030)
sa			-0.036 (0.023)
size	0.013** (0.005)	0.640*** (0.021)	0.035** (0.015)
roa	0.409*** (0.098)	0.538 (0.397)	0.428*** (0.098)
lev	0.007 (0.009)	-0.028 (0.036)	0.006 (0.009)
Constant	-0.007 (0.143)	-11.265*** (0.581)	-0.408 (0.292)
Observations	123	123	123
R-squared	0.143	0.900	0.161

Standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

4.2 Robustness Test

To verify the robustness of the empirical results, this paper divides enterprises into a high ESG group and low ESG group based on the median ESG score, constructs an ESG grouping dummy variable (*high_eff*); constructs a variable with 1% upper and lower extreme values (*fin_eff_w*); and uses alternative financing efficiency variable *fin_eff_w*: (financial expenses±exchange gains and losses)/total assets, as the dependent variable. Robustness tests are conducted from these four perspectives, and the test results are shown in Table 3.

Both the high and low ESG performance groups are compatible with the main regression model, according to the regression findings obtained by splitting the sample companies into these two distinct groups. but neither of them has reached statistical significance. The reasons may be that the sample size is small, the standard error is large, and other control variables such as enterprise size (*Size*) and profitability (*Roa*) have a dominant influence; the results of the 1% upper and lower extreme value treatment of the financing efficiency variable (*fin_eff*) show that after eliminating the interference of extreme samples, the significance is increased to 5%, and the significance still shows a negative impact, which is consistent with the main regression model; the robustness test using the substitution variable method shows that the ESG significance reaches the 1% significance level and the direction is consistent. The results show that even if the measurement caliber of financing efficiency is changed, ESG's beneficial effects are still strong.

The total test findings demonstrate that new energy listed businesses' disclosure of ESG information has a very strong positive effect on corporate financing efficiency.

Table 3. Robustness test

	(1) Fin Eff	(2) Fin Eff	(3) Fin Eff	(4) Fin Eff
esg	-0.128 (0.130)	-0.0359 (0.0441)	-0.0505** (0.0202)	-0.0121*** (0.00374)
size	0.0101 (0.0115)	0.00672 (0.00466)	0.0127** (0.00594)	0.00169** (0.000649)
roa	0.796* (0.416)	0.266* (0.156)	0.409* (0.229)	-0.0151 (0.0135)
lev	0.197* (0.111)	0.00307** (0.00153)	0.00718** (0.00357)	0.00207*** (0.000228)
Observations	61	62	123	123
R-squared	0.287	0.085	0.143	0.220

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

4.3 Heterogeneity test

This study uses a heterogeneity test, splits the sample into groups with high and low ESG levels based on the median ESG rating score, and regresses the sub-samples independently to investigate whether there are variations in the effects of various ESG rating levels on the financing efficiency of new energy A-share listed companies. Table 4 displays the regression findings. According to the regression results, ESG scores can positively affect financing efficiency while negatively affecting the financing cost rate in both the high and low groups. Although the impact of both high and low groups failed to reach statistical significance, the regression coefficient of the high-level ESG group (-0.099) was greater than that of the low-level ESG group (-0.053), indicating that the positive impact of ESG on corporate financing efficiency is more significant in companies with higher ESG levels. Therefore, it can be concluded that the impact of ESG level on the financing efficiency of new energy A-share listed companies is heterogeneous. A high ESG level contributes to the company's sustainability and is a short- and long-term profitable business strategy [10]. Therefore, companies with relatively excellent ESG performance may have more advantages in financing efficiency due to their operational stability and high recognition in the capital market.

Table 4. Heterogeneity test

VARIABLES	(1)	(2)
	Fin Eff	Fin Eff
ESG	-0.099 (0.144)	-0.053 (0.067)
size	0.012 (0.011)	0.007 (0.006)
roa	0.848*** (0.202)	0.235 (0.155)
lev	0.195** (0.077)	0.002 (0.008)
Constant	0.094 (0.621)	0.104 (0.290)
Observations	61	62
R-squared	0.319	0.156

Standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

5 Conclusions

Based on the data of A-share listed companies in China's new energy field from 2020 to 2023, this paper uses empirical tests to examine how the effectiveness of corporate

funding is affected by the publication of ESG data. To investigate the mediating influence, the degree of financing constraints is also introduced. This paper also conducts two robustness tests to verify the reliability of the main regression model, and divides high-ESG level companies and low-ESG level companies for heterogeneity tests. Based on the above analysis results, ESG performance can significantly and stably have a positive impact on financing efficiency, but the mechanism of ESG performance improving financing efficiency by reducing financing constraints is not the main influencing path. The conclusions of the two robustness tests show that the direction of ESG impact is consistent, but the significance is slightly weakened under the grouping variable. Through the heterogeneity test, it can be concluded that ESG has differences in improving corporate financing efficiency, and corporate financing efficiency is improved more significantly by the ESG performance of high-ESG performance companies. Therefore, it can be concluded that ESG information disclosure can improve corporate financing efficiency directly and consistently.

This paper mainly focuses on the background of the new energy industry, condenses the research object, and introduces financing constraints as a mediating variable to explore the mechanism of ESG affecting financing efficiency. However, this paper uses the SA index as a static proxy variable for financing constraints, and only considers the impact of company size and years of operation, without dealing with complex factors such as the external financing environment and corporate governance structure. Therefore, the explanatory fit for the ESG impact path is limited.

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