# Can corporate ESG performance ease financing constraints

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**Abstract.** Currently, corporate ESG disclosure as important non-financial information can convey the potential sustainability of a company to investors and become one of the key considerations in the investment and financing decision process. Corporate ESG alleviates financing constraints by reducing the degree of information asymmetry and agency problems. This paper adopts data of A-share listed companies in Shanghai and Shenzhen from 2011-2021, and systematically examines the specific effects and impact mechanisms between corporate ESG and financing constraints based on the two-way fixed-effect model and the China Securities ESG rating analysis report. The study finds that corporate ESG performance significantly alleviates financing constraints, and the findings remain robust after a series of robustness tests. The findings of this paper enrich the research on the economic consequences of corporate ESG for real enterprises and the influencing factors of corporate financing constraints, which have important inspirational influence and reference values for promoting high-quality corporate development.

**Keywords:** Corporate ESG; financing constraints; financing costs; information asymmetry; sustainable development.

## 1. Introduction

Classical financing theory suggests that information asymmetry and agency problems in imperfect capital markets are the main causes of financing constraints. There is a significant difference in the cost of financing inside and outside the company because each investor does not have complete information about the current production and operation of the company and the risk of uncertainty grows, leading to an increase in the risk premium required by investors[1], which increases the cost of external financing. In addition, based on the economic man hypothesis, professional managers think rationally about the desirability of their own compensation, deployable resources, and other aspects, so they often make choices at the expense of the group in order to obtain more personal benefits. The causes of this phenomenon of financing constraints are richer. Internal factors are mainly the nature of company ownership, corporate commercial credit and internal corporate control, etc., while external factors are mainly the level of regional financial development, national monetary policy, external information, etc.[2]. Financing constraint is one of the important factors affecting corporate investment, and excessive financing constraint may make companies give up better investment opportunities due to financing difficulties, thus leading to underinvestment.

As climate deterioration and environmental pollution gradually intensify, multiple stakeholders, such as international organizations, governments and investors, are paying more attention to corporate ESG performance, i.e. Environmental, Social and Governance. Currently, ESG has been incorporated into the capital market disclosure requirements in more than 30 countries and regions around the world, and has become an important standard for the international community to measure the level of green and sustainable development of enterprises. Corporate ESG performance has received increasing attention from all sectors of society, and Wang, Zhi and Peng, Baichuan (2023) found that good corporate ESG performance can significantly improve corporate innovation performance[3]. Innovation is an important factor for companies to maintain competitiveness in the industry, and the improvement of ESG performance can help companies to better access the resources needed for innovation. By providing consumers with green products, companies can in turn increase their R&D investment, enhance their technological innovation, and achieve long-term sustainable development. In addition, good ESG performance can enhance the value of a company. Wang Bo (2022) found that ESG performance has an enhancing effect on the market value and book value of enterprises: on the

one hand, excellent ESG performance helps to increase the market attention of enterprises, which leads to a broader consumer market, higher product profitability, and ultimately the value-added of enterprise market value; on the other hand, good ESG performance helps enterprises to alleviate financing constraints by reducing financing costs and broadening financing channels, thus promoting their book value appreciation[4]. Thus, it can be seen that the impact of corporate ESG performance is widespread, and its position in the corporate financing process is becoming more and more important.

Domestic studies have paid corresponding attention to the impact of corporate ESG information disclosure on financing constraints. Many scholars have found that non-financial information disclosure, such as environmental protection information (Zhou Zhifang et al., 2023)[5], social responsibility information (Chen Wen and Wang Chenyu, 2021)[6], and green governance level (Li Weian et al., 2019)[7], can reduce the degree of information asymmetry of investors, convey their good corporate development prospects to the outside world, enhance investors' confidence, reduce their required remuneration rate, and ultimately alleviate the corporate financing constraint. ESG disclosure is more significant in non-state enterprises, enterprises in the growth or maturity stage, after the implementation of the new Environmental Protection Law, and enterprises that voluntarily disclose their social responsibility[8]. Corporate ESG performance can help firms obtain lower cost debt and equity financing to alleviate financing constraints, in which the information asymmetry factor plays a mediating effect[9]. A review of the existing literature reveals that most scholars mainly explore information disclosure and firms' economic performance or financial performance, while research on non-economic performance such as financing constraints and ESG performance remains scarce, and there is a lack of research on the corresponding mechanisms of action.

The possible marginal contributions of this paper are mainly reflected in the following points. First, it incorporates corporate ESG performance and financing constraints into the same analytical framework and attempts to explore the mitigation effect of financing constraints from the perspective of corporate ESG performance, broadening the existing research in the corporate ESG-related literature. Second, this paper provides empirical evidence on the mitigation effect of corporate ESG performance on financing constraints and its mechanism and heterogeneity by using a sample of A-share listed companies in Shanghai and Shenzhen from 2011-2021, which helps companies to adopt differentiated and dynamic strategies in their digital transformation practices and balance economic and social benefits.

## 2. Theoretical mechanisms and research hypotheses

First, corporate ESG alleviates financing constraints by reducing the degree of internal and external information asymmetry. Internal business managers tend to have more effective actual information about the firm than external investors, which leads to higher external financing costs than internal capital costs of the firm and generates financing constraint problems. Relevant studies have shown that institutional investors tend to have significant ESG responsible investment preferences (Zhou, Fangzhao et al., 2020)[10]. ESG is the disclosure of non-financial information about the enterprise and is done by a specialized third-party institution, and the rating process is not involved by the enterprise, so the data authenticity is relatively high. Corporate ESG helps investors to comprehensively understand the business development status of enterprises and reduce the degree of information asymmetry between enterprises and stakeholders, thus reducing the information risk premium (Li Jinglin et al., 2023)[11]. Even if a firm's current business situation is poor, ESG-related non-financial information will enhance information transparency and reduce management's hidden motives, thus helping the firm to gain investors' emotional support and recognition (Chao Chen et al., 2022)[12]. Therefore, by striving to improve the quality of their ESG performance and information disclosure, firms alleviate investors' market doubts due to closed access to information, reduce the cost and resistance of firms in the financing process, obtain more external capital, and alleviate the financing constraint problem.

Second, corporate ESG alleviates financing constraints by sending positive signals. The content of ESG rating meets the new requirements of corporate responsibility in the current social development, and enterprises fulfill their social responsibility by developing low-carbon environment protection and actively participating in community and charitable causes[13]. Good ESG performance of an enterprise conveys to the outside world its adherence to the concept of sustainable development, represents the development direction of the enterprise's long-term strategy, helps the enterprise establish a good image and gain a good reputation, reduces the decision-making risk of creditors and investors, helps the enterprise obtain financial support, and reduces the degree of financing constraints[14]. Since investors are generally not directly involved in the business activities of the invested enterprises, the authenticity and comprehensiveness of corporate ESG information disclosure is very important, high-quality information helps investors to understand corporate conditions more comprehensively and make correct investment decisions, while low-quality information can intensify investors' investment risks. Corporate ESG information disclosure will receive attention from analysts, external investors, media and others, and the enhanced external supervision promotes companies to improve the quality of non-financial information supply as well as their own legitimacy status, thus reducing the information risk investors need to face and the cost of capital they require, and finally alleviating financing constraints.

Third, corporate ESG alleviates financing constraints by improving sustainability. Kaitao Tang et al. (2023) argue that the requirements of corporate information disclosure system regarding ESG make the core position of the board of directors clear and refine the rights and obligations of directors, executives, and supervisors, which improves the sustainability of the company and reduces the business risk of the company[15]. Under ESG rating criteria, companies pursue economic profits while implementing the concept of sustainable development to enable long-term growth[16]. The market value and financing cost of a company depend on the health of its long-term operation. In the short term, a company's investment in ESG will incur certain costs, but in the long term it can improve the efficiency of its operation by saving expenses in other channels. In the face of poor ESG performance, investors often respond to lawsuits or administrative fines from corporate environmental pollution by cutting investment, etc., exposing firms to higher financing costs. Jiang, Hai et al. (2023) considered business ethics as one of the core elements of ESG[17]. If most companies in the market follow the law of development, adhere to business ethics and morality, and take social responsibility into account, vicious competition in the market will also be reduced, and the role and status of market resource allocation will be further enhanced, and enterprises can also obtain more financial support in financing and alleviate corporate financing constraints.

In summary, the research hypothesis is proposed: good corporate ESG performance can alleviate financing constraints.

## 3. Research design

### 3.1. Indicator construction

#### 3.1.1. Selection of dependent variable

KZ index is an index proposed by American economists Joshua Lerner and Luigi Zingales to measure the degree of competition in financial markets, which reflects the degree of difficulty faced by enterprises in obtaining external capital in different financial markets. The KZ value is taken as an absolute value, and the larger the value, the stronger the degree of financing constraint and the more difficult it is for the firm to raise capital.

#### 3.1.2. Selection of independent variable

The independent variable ESG data is obtained from the China Securities ESG rating analysis report, which has the characteristics of high update frequency, wide coverage and high data availability (Wang Linlin et al., 2022)[18]. The China Securities ESG index system is based on the index to score, and the final nine ratings of C~AAA are obtained. For the convenience of empirical

analysis, the nine grades of C~AAA ratings are assigned 1~9, and higher ESG scores indicate better ESG performance of enterprises.

### 3.2. Model design

Drawing on the studies of Jie Hu et al. (2022)[19] and Hongjun Xie et al. (2022)[20], model (1) is constructed to test the impact of corporate ESG on financing constraints.

$$KZ_{it} = \alpha_0 + \alpha_1 ESG_{it} + \alpha_2 Z_{it} + \mu_i + \delta_t + \varepsilon_{it} \quad (1)$$

where *ESGit* is the ESG performance score of firm *i* in period t and *KZit* is the level of green innovation of firm *i* in period *t*. To address the endogeneity problem interference caused by omitted variables, this paper refers to the existing literature (Sun, Bing et al., 2022; Hu, Jie et al., 2022)[21] and introduces the following control variables (*Zit*). Specifically, firm size (*size*), measured as the logarithm of the firm's total assets; firm age (*age*), measured as the logarithm of the firm's years of establishment; firm growth capacity (*growth*), measured as the growth rate of the firm's total assets; firm duality rate (*duality*), measured as the concurrent appointment of the firm's chairman and general manager; board size (*board*), measured as the logarithm of the number of board members, and the concentration of equity (*top3*) is measured by the shareholding ratio of the top 3 shareholders. Meanwhile, the model in order to avoid individual heterogeneity in within-group regressions, thus including individual fixed effects that indicate that city *i* does not change over time, indicating time fixed effects. Further, the random error terms in this paper are clustered to the firm level to address the systematic heteroskedasticity of the model.

### 3.3. Data sources and descriptive statistics

This paper selects Shanghai and Shenzhen A-share listed companies from 2011-2021 as the research object and screens them according to the following steps: (1) exclude financial listed companies; (2) exclude samples with missing financial data or insolvency; (3) exclude samples that are marked ST or *ST in the current year. Firm-level cluster regressions are performed on the samples to eliminate the interference of differences between data groups and to reasonably control the effect of heteroskedasticity. The financial data used in the study were derived from the CSMAR database.

**Table 1.** Descriptive statistics

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| ESG | 31549 | 6.506 | 1.125 | 3.000 | 9.000 |
| KZ | 28017 | 0.973 | 2.450 | -11.345 | 13.662 |
| SA | 32702 | 3.790 | 0.276 | 1.455 | 5.646 |
| size | 36465 | 22.117 | 1.426 | 15.573 | 30.998 |
| age | 40154 | 2.764 | 0.416 | 0.000 | 4.143 |
| growth | 30047 | 0.580 | 29.097 | -0.972 | 4719.612 |
| board | 35590 | 2.126 | 0.204 | 0.000 | 3.045 |
| top3 | 32590 | 34.523 | 15.075 | 0.286 | 89.991 |
| duality | 35904 | 0.317 | 0.554 | 0.000 | 33.515 |

From Table 1, from the perspective of the independent variables, the mean value of ESG performance is 6.506, indicating that the average ESG rating of the sample firms is between BBB and A, the overall level of ESG performance is high. With a minimum value of 3 and a maximum value of 9, and a standard deviation of 1.125, indicating that there is a significant difference between the levels of ESG performance among the sample firms. From the perspective of the dependent variable, the mean value of KZ index is 0.973, with a minimum value of -11.345 and a maximum value of 13.662, indicating that there are significant differences in the financing constraints of the sample firms.

# 4. Empirical Analysis

## 4.1. Baseline regression

Table 2 reports the regression results on the effect of corporate ESG disclosure on financing constraints. Column (1) of Table 2 reports the results of univariate regressions of corporate ESG disclosure on financing constraints, while columns (2)-(6) report the results of regressions of corporate ESG disclosure on financing constraints with the addition of six control variables, *size, age, growth, board, top3, and duality*, respectively. This result shows that the independent variable ESG disclosure is negative at the 1% level, there is a significant negative relationship between ESG disclosure and financing constraints, indicating that corporate ESG disclosure helps to reduce financing constraints.

**Table 2.** Baseline regression

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| ESG | -0.1533*** | -0.1472*** | -0.1333*** | -0.1333*** | -0.1328*** | -0.1266*** | -0.1283*** |
| | (0.0144) | (0.0145) | (0.0144) | (0.0144) | (0.0144) | (0.0144) | (0.0144) |
| size | | -0.1062*** | -0.1469*** | -0.1470*** | -0.1472*** | -0.1484*** | -0.1493*** |
| | | (0.0252) | (0.0251) | (0.0251) | (0.0253) | (0.0257) | (0.0257) |
| age | | | 3.0969*** | 3.0979*** | 3.1024*** | 2.9173*** | 2.9221*** |
| | | | (0.1408) | (0.1408) | (0.1410) | (0.1426) | (0.1428) |
| growth | | | | -0.0001 | -0.0001 | -0.0001 | -0.0001 |
| | | | | (0.0003) | (0.0003) | (0.0003) | (0.0003) |
| board | | | | | -0.1044 | -0.1335 | -0.1244 |
| | | | | | (0.0992) | (0.0993) | (0.0998) |
| top3 | | | | | | -0.0153*** | -0.0155*** |
| | | | | | | (0.0018) | (0.0018) |
| duality | | | | | | | -0.0076 |
| | | | | | | | (0.0299) |
| _cons | 2.0015*** | 4.3299*** | -3.6694*** | -3.6707*** | -3.4597*** | -2.3584*** | -2.3505*** |
| | (0.0947) | (0.5611) | (0.6640) | (0.6640) | (0.6850) | (0.6981) | (0.6999) |
| *Firm FE* | YES | YES | YES | YES | YES | YES | YES |
| *Year FE* | YES | YES | YES | YES | YES | YES | YES |
| *Industry FE* | YES | YES | YES | YES | YES | YES | YES |
| *N* | 27534 | 27521 | 27521 | 27521 | 27499 | 27474 | 27387 |
| adj. $R^2$ | 0.5773 | 0.5773 | 0.5856 | 0.5855 | 0.5860 | 0.5874 | 0.5874 |

## 4.2. Robustness analysis

To ensure the robustness of the research findings, the following robustness tests are done in this paper.

### 4.2.1. changing the measurement of financing constraints

First, this paper draws on the existing literature (Min Wang and Yude Xu, 2023; Zhibin Li et al., 2022)[8, 22] to measure the financing constraint of firms by using SA index instead of KZ index for regression. The financing constraint SA index is measured by using *size* and *age*, with *size* being the logarithm of the firm's total assets and *age* being the firm's age. The SA value is taken as an absolute value, and the larger the value, the stronger the degree of financing constraint of the enterprise and the greater the difficulty in financing.

$$SA_{it} = -0.737 \cdot size_{it} + 0.043 \cdot size_{it}^2 - 0.04 \cdot age_{it} \quad (2)$$

Column (1) of Table 3 shows that the corporate ESG coefficient is valued at -0.4060 and is significantly and negatively related to financing constraints, while column (2) shows the regression results after adding control variables, and the corporate ESG coefficient is valued at negative and significant. Therefore, corporate ESG disclosure helps to reduce financing constraints.

### 4.2.2. Changing the ESG measure

The baseline regression part uses the China Securities ESG data, and in the robustness test part, this paper refers to existing studies (Fang Xianming and Hu Ding, 2023; Wang Yiqiu and Xie Meng, 2022) [23, 24] and chooses the Bloomberg ESG score index to measure the ESG performance of firms, which provides ESG disclosure indicators varying in the numerical interval of [0, 100], and the higher the score of this variable, reflecting the higher the degree of ESG disclosure of listed companies, the better the ESG performance of companies.

Columns (3) and (4) of Table 3 show that the coefficient of corporate ESG is negative and significant, indicating corporate ESG disclosure helps to reduce financing constraints.

### 4.2.3. OLS regression

In addition, we use OLS regression models to further examine the robustness of the findings without controlling for fixed effects. Columns (5) and (6) of Table 3 show that the coefficient of corporate ESG is negative and significant, therefore, corporate ESG disclosure helps to reduce financing constraints.

Through the above robustness tests, it is found that the results after using different measures and different econometric models are consistent with the benchmark regressions, again enhancing the robustness of the findings.

**Table 3.** Robustness tests

| | (1) SA | (2) SA | (3) KZ | (4) KZ | (5) KZ | (6) KZ |
|---|---|---|---|---|---|---|
| *ESG2* | -0.4060*** | -0.4406*** | -0.0054*** | -0.0069*** | -0.1145*** | -0.2301*** |
| | (0.1204) | (0.1205) | (0.0006) | (0.0006) | (0.0125) | (0.0133) |
| *size* | | 0.1044** | | 0.0205*** | | 0.2818*** |
| | | (0.0416) | | (0.0009) | | (0.0128) |
| *age* | | 2.4556*** | | 0.0300*** | | 0.3302*** |
| | | (0.2220) | | (0.0058) | | (0.0411) |
| *growth* | | -0.0011 | | 0.0000*** | | 0.0001 |
| | | (0.0013) | | (0.0000) | | (0.0002) |
| *board* | | -0.3494** | | 0.0067* | | 0.2507*** |
| | | (0.1523) | | (0.0040) | | (0.0759) |
| *top3* | | -0.0027 | | -0.0006*** | | -0.0154*** |
| | | (0.0028) | | (0.0001) | | (0.0010) |
| *duality* | | -0.0367 | | -0.0003 | | -0.3505*** |
| | | (0.0502) | | (0.0012) | | (0.0329) |
| *_cons* | 2.3760*** | -6.0983*** | 3.8310*** | 3.3122*** | 1.7220*** | -4.6433*** |
| | (0.4014) | (1.1658) | (0.0038) | (0.0269) | (0.0835) | (0.2812) |
| *Firm FE* | YES | YES | YES | YES | NO | NO |
| *Year FE* | YES | YES | YES | YES | NO | NO |
| *Industry FE* | YES | YES | YES | YES | NO | NO |
| *N* | 10588 | 10528 | 31072 | 29291 | 27925 | 27779 |
| adj. $R^2$ | 0.6194 | 0.6252 | 0.9369 | 0.9417 | 0.0028 | 0.0413 |

## 5. Conclusions and Implications

This paper empirically examines the mitigating effect of corporate ESG performance on financing constraints using the data of A-share listed companies in Shanghai and Shenzhen from 2011-2021 as a sample. The results show that ESG-related behaviors have a significant effect on improving financing constraints, and the better the ESG performance of enterprises, the more significant the alleviation of financing constraints. The mechanism by which ESG performance mitigates financing constraints is that good ESG performance can help firms attract the attention of capital market intermediaries, gain more analysts' attention, and alleviate the information asymmetry between investors and firms. In addition, good ESG performance can also effectively alleviate the principal-

agent conflict faced by firms, which in turn alleviates corporate financing constraints. Based on the findings of this paper, the following insights are obtained:

First, ESG system construction is inseparable from government policy guidance[25]. The government should further regulate the laws and regulations on corporate ESG information disclosure, improve the corporate ESG information evaluation system, enhance the corporate ESG information disclosure mechanism, and prioritize the allocation of resources to companies that actively disclose ESG information to improve resource allocation efficiency. In addition, third-party institutions should be encouraged to actively carry out verification and evaluation of corporate ESG information disclosure, improve the completeness and standardization of corporate ESG information disclosure, and enhance the transparency and interpretation of ESG ratings.

Second, Chinese enterprises should continuously improve their ESG performance and make it organically integrated with their corporate strategies[26]. Enterprises should take ESG investment and financing concept as a strategic guide for sustainable development, focus on corporate environmental, social and corporate governance issues, and at the same time make comprehensive consideration and personalized design by combining the current situation of corporate governance, business characteristics and social values, and establish an ESG governance structure covering all levels, with clear division of labor and clear authority and responsibility, so as to escort the implementation of corporate ESG strategy.

Third, China's rating agencies should continue to optimize their rating methods and output high-quality rating reports. ESG rating reports are comprehensive evaluations of corporate ESG performance and an important way for investors to understand the level of corporate ESG performance. Rating agencies should enrich the information collection methods, optimize the scoring and weighting rules, expand the rating coverage, and continue to output high-quality rating reports to all sectors of society according to market demand.

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