ESG performance and improvement of corporate accounting information quality

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Abstract. In recent years, the concept of ESG development has attracted increasing attention, and ESG performance has gradually become an important measurement dimension in the evaluation of sustainable development and long-term investment value of listed companies. The article examines the effect and mechanism of ESG performance on the quality of corporate accounting information using a sample of China's A-share listed companies in Shanghai and Shenzhen from 2009 to 2021. The study finds that corporate ESG performance is conducive to improving the quality of corporate accounting information, and that good corporate ESG performance can help alleviate corporate financing constraints, improve corporate reputation and thus improve the quality of corporate accounting information. In addition, the heterogeneity of the nature of enterprise ownership and industry type shows that ESG performance has a more obvious effect on the quality of accounting information for non-state-owned enterprises and enterprises in heavily polluted industries. The article reveals the relationship between ESG performance and the quality of corporate accounting information, which provides a reference for the subsequent research on the economic consequences of ESG performance, and has a certain revelation significance for promoting the high-quality development of Chinese enterprises.

Keywords: ESG performance, accounting information quality, corporate reputation, Financing constraints, Nature of property rights, Type of industry.

1. Introduction

ESG is an acronym for Environment, Social and Governance, which is an evaluation system that considers the three dimensions of corporate environment, social responsibility and corporate governance. in the 1960s, with the rise of social movements and the deterioration of the climate environment, investors paid more and more attention to the consideration of social responsibility and environmental factors in decision-making. From the 1980s to the present, the emergence of financial fraud and other negative events has triggered the public to think about the issue of corporate governance (Milosevic et al., 2015) [1]. In 2006 the United Nations Principles for Socially Responsible Investment (UN-PRI) organization put forward the concept of ESG (Environmental, Social and Governance) for the first time by taking the environmental (E), social (S) and governance (G) factors as an important indicator for measuring sustainable development. Since then, the ESG concept has begun to receive widespread attention globally. Government departments, regulators and industry associations have introduced a series of measures aimed at strengthening the ESG practices of listed companies, improving the ESG disclosure system, enhancing the quality of corporate ESG disclosure, and encouraging and promoting listed companies to incorporate ESG issues into their development strategies, to reap the double dividends of economic and social values and realize a "win-win situation". "The following are some examples of ESG practices of listed companies. Accounting has a crucial role for a business. The quality of accounting information will affect the development of the enterprise, and the development of the enterprise will affect the interests of the enterprise operators. As the reform of China's market economic system continues to advance, the role and function of accounting information has become particularly important. Enterprises are the providers of accounting information, effective accounting information helps to get the attention of investors and release certain signals to the market to improve the investor's "anchoring effect", which helps the information users to assess the financial operation status of the enterprise and the enterprise value as well as to predict the future performance of the enterprise, and helps the information users

to make the correct economic decisions. However, for a long time, the quality of China's corporate accounting information is still at a relatively low level. Since the beginning of the 21st century, after the financial fraud case of Enron in the United States, Xerox, WorldCom and other large companies have broken out one after another accounting scandals. In such an international context, China has also broken out financial fraud cases many times in recent years, such as the Kangmei incident in 2019, the Ruixing financial fraud incident in 2020, the Yihua Life information disclosure violation case in 2021, and the Tongjitang information disclosure violation case in 2022, etc., which seriously affects the economic subjects to make investment decisions and restricts the rapid development of China's market economy, and the social community is also increasingly realize the urgency and importance of improving the quality of accounting information disclosure. Therefore, this paper tries to ask the following questions: Does good ESG performance help to improve the quality of accounting information? If yes, what is the transmission mechanism? What are the differences in the effects of ESG performance on the quality of accounting information among different corporate ownership and industry types? A comprehensive discussion of the above questions will not only help improve the quality of accounting information of listed companies, but also optimize resources, translate ESG performance into actual resource allocation, and allow funds to flow continuously among "green" enterprises to achieve green and sustainable development.

It has been found that good ESG performance improves corporate performance (Yuan and Xiong, 2021) [2], increases firm value (Wang and Yang, 2022) [3], improves investment efficiency (Gao et al., 2021) [4], eases financing constraints (Xi and Zhao, 2022) [5], prompts firms to increase R&D investment by easing financing constraints and curbing resource mismatches (Lin and Li, 2023) [6], and promotes firms' innovation performance through reputational and resource allocation effects(Wang and Peng, 2022) [7]. As important non-financial information, corporate ESG performance can release positive signals to the market, which can bring positive promotion effect to the credit rating of the enterprise (Attig et al., 2020) [8], and at the same time, corporate ESG performance is also an important basis for investors to make investment decisions (Broadstock et al., 2021; Heje et al., 2020) [9] [10], however, the current literature seldom deals with the impact of corporate ESG performance on the quality of accounting information.

As for the research on accounting information quality, the literature has studied the influencing factors of accounting information quality from a variety of factors such as internal and external factors of the company, but there is little research on the impact of ESG on accounting information quality from the three aspects of the environment, social responsibility, and corporate governance. From an intra-firm perspective, Fan et al. (2013) [11] found that high-quality internal controls are a way to reduce corporate surplus management; Xu and SEOP (2018) [12] use data from the Shenzhen Stock Exchange and find that the proportion of state-owned shares, the proportion of outstanding shares, the concentration of ownership, the size of the board of directors, the size of the supervisory board, and the proportion of the board of directors' ownership are all positively related to the quality of accounting information disclosure; Liu and Wang (2021) [13] verified that the nature of corporate ownership also has an impact on surplus management. From the external point of view, Lai (2016) [14], after regression analysis, found that a high-quality institutional environment will increase the violation cost of false accounting information disclosure, and form a certain constraint on the behavior of managers, which will have a positive effect on the improvement of the quality of the company's accounting information disclosure; Xie (2019) [15]studied all listed firms from 2012 to 2016 and concluded that there is a positive relationship between the quality of accounting disclosure and external audit supervision; Shao and Chen (2018) [16] found that the weaker the link between the accounting firm and the enterprise, the higher the independence, and the higher the truthfulness and completeness of information disclosure of the audited enterprise; Ren and Wang (2019) [17] study that the more competitive the external market situation is, the higher the quality of corporate accounting disclosure will be to obtain more market.

In view of this, this paper uses the CSI ESG rating data, which has a higher update frequency, wider coverage and higher data availability in the current domestic rating system, as the basis for

evaluating corporate ESG performance. China's A-share listed companies in Shanghai and Shenzhen from 2009 to 2021 are selected as samples, and the impact mechanism of ESG performance on improving the quality of corporate accounting information is examined. The empirical results show that the improvement of corporate accounting information quality stems from the fact that good ESG performance can alleviate corporate financing constraints and improve corporate reputation. Further, the results of heterogeneity test based on the nature of enterprise ownership and industry indicate that: the positive impact of ESG performance on accounting information quality is more obvious for non-state-owned enterprises; the higher the pollution level of the industry in which the enterprise is located, the greater the positive impact of ESG performance on the quality of enterprise accounting information.

Compared with the established literature, this paper may have the following marginal contributions: (1) By examining ESG performance and the accounting information quality of listed companies, this paper provides the latest evidence that ESG can improve the quality of accounting information, and expands and enriches the literature in this area. (2) After confirming that ESG performance can improve the quality of accounting information, it further analyzes the mediating mechanism through which ESG performance affects the quality of accounting information: ESG performance can act on the quality of accounting information by alleviating corporate financing constraints and enhancing corporate reputation. This clarifies the intrinsic mechanism of ESG performance affecting the quality of corporate accounting information, and makes an important addition to the literature for in-depth understanding of the specific mechanism of ESG impact. (3) Since the current ESG-related literature rarely involves the nature of the industry as a moderating variable, this paper analyzes the heterogeneous impact of ESG performance on corporate accounting information in a more comprehensive and in-depth manner from the perspectives of both the nature of corporate property rights and the nature of the industry, expands and enriches the related research on the mechanism of the impact of ESG performance on the quality of corporate accounting information, and provides more targeted suggestions for further improving the quality of accounting information.

2. Theoretical analysis and research hypotheses

2.1. Mechanisms of ESG performance on the quality of corporate accounting information

From the viewpoint of the existing literature, the reasons for management's surplus manipulation usually include satisfying managerial self-interested behavior, alleviating financing constraints, and satisfying capital market stakeholders' expectations, which are mostly related to firms' operating performance and capital needs (Gao and Hang, 2023; Ye et al., 2015; He and Mi, 2012) [18] [19] [20]. In contrast, firms with good ESG performance usually have good operating performance, adequate sources of capital, and high external attention, and with these incentives for surplus management mitigated, corporate management will reduce surplus manipulation accordingly, and the quality of corporate accounting information will improve, According to signaling theory, companies actively practicing ESG practices can send positive signals to stakeholders: first, it shows that the company is socially conscious. Lins et al. (2017) scholars in their study of the relationship between social capital, trust and firm performance found that socially performing firms tend to be more favored and supported by investors and have easier access to key resources needed for firm growth [21]. According to Richardson and Welker (2001) research, social responsibility disclosure can reduce the cost of corporate finance, which to a certain extent can alleviate the financing constraints faced by enterprises [22]; secondly, it shows that enterprises have strong environmental awareness. Villiers and Staden (2010) found that firms that disclose detailed environmental information and have good environmental performance are more likely to obtain external investment and achieve their financing goals [23]. Plumlee et al. (2015) found that proactive disclosure of environmental information increases firms' free cash flow and reduces the cost of equity financing [24]. At the same time, with the implementation of the green credit policy and the increase in environmental penalties, banks are more willing to lend to enterprises that actively disclose environmental information and emphasize

environmental protection (Qiu and Yin, 2019) [25]; Thirdly, it shows that the corporate governance mechanism is perfect. Ashbaugh-Skaife et al. (2009) found that the cost of equity capital for external financing will be elevated when the internal governance of the enterprise has malpractices [26]. At the same time, forced by the pressure of moral cost, rational corporate management tends to be more honest and trustworthy, establish a perfect internal governance mechanism, and release positive signals to the outside world to win investors' favor.

Corporate ESG performance provides investors with more comprehensive and integrated corporate information, creates a better investment environment for investors, helps investors assess corporate value, predict corporate future development, make more informed investment decisions, and investors' interests can be better protected. Therefore, good ESG performance is conducive to meeting the expectations of capital market stakeholders, catering to the investment preferences of investors, helping enterprises to better raise the funds needed for their own development, and the motivation of corporate surplus management is alleviated, thus reducing corporate surplus management behavior and improving the quality of corporate accounting information. Therefore, this paper puts forward the research hypothesis:

H1: ESG can improve the quality of accounting information by alleviating financing constraints.

According to Mishina et al. (2012) [27], corporate reputation, as a unique resource closely related to stakeholder groups, gathers the perceptions and emotions of corporate stakeholders about the past actions and prospects of the enterprise, and this subjective feeling is a kind of evaluation of the enterprise by the stakeholders based on the fulfillment of their own expectations and will have an impact on their next actions. Analyzing previous studies, it is found that in terms of environmental performance, if a company actively undertakes environmental responsibility, it will reduce the degree of corporate information opacity through environmental information disclosure and establish a green reputation (Yu et al., 2021) [28]; in terms of social performance, a good performance of corporate social responsibility will lead to the enhancement of corporate information transparency and the acquisition of social reputation (Chi et al., 2017) [29]; and in terms of governance performance, in the case of unknown corporate performance, the corporate governance mechanism directly determines stakeholders' perceptions of corporate reputation. determines stakeholders' perception of corporate reputation (Wang and Zhang, 2011) [30]. Due to the existence of information asymmetry between enterprises and stakeholders, each stakeholder must pay a high cost to obtain more comprehensive information, and sometimes it is difficult to get accurate and reliable information even after paying resources. Therefore, by developing ESG practices and proactively disclosing information related to them, enterprises can improve their transparency in environmental, social and corporate governance, enable stakeholders to better understand the enterprise and meet the expectations of different stakeholder groups for the enterprise, and help the enterprise create reputational capital.

On the other hand, firms with good ESG performance are subject to more external attention and monitoring, which reduces the possibility of management's self-interest. Zhang and Bao (2014) [31] found that the external image of a firm will be severely damaged if the firm is investigated by the regulator for financial fraud and misrepresentation violations. The good reputation and image built up by the firm through improving ESG performance will fade away. Therefore, companies with good ESG performance will minimize their surplus management activities to provide more truthful and reliable accounting information to the outside world for the sake of maintaining corporate reputation (Dhaliwal et al., 2011; Kim et al., 2012) [32] [33]. Therefore, this paper proposes the research hypothesis:

H2: ESG can improve the quality of accounting information by enhancing corporate reputation.

2.2. Moderating effects of the nature of property rights and industry type

At the firm level, it has been found that the nature of a firm's ownership affects the motivations behind its ESG performance (Gao and Huang, 2023; Yi and Sun,2023; Wang et al., 2022) [34] [35] [36]. (1) Liu et al. (2014) [37] scholars showed that Chinese SOEs have higher surplus smoothing

and lower value relevance. Non-state-owned enterprises are more efficient in operation and management compared to state-owned enterprises, which is more favorable for them to reduce their own real surplus management activities while implementing ESG strategies. (2) State-owned enterprises (SOEs) are characterized by the duality of "entrepreneurial" and "public" and have the dual status of state intervention and market participant, so SOEs are more inclined to respond to the call of the state to fulfill the three aspects of the environment, social responsibility and corporate governance, rather than economic interests. rather than economic interests. Compared with SOEs, non-SOEs, as pure market participants, are more focused on pursuing short-term economic benefits, and the difference in the motivation and form of ESG practices will lead to a stronger enhancement effect of non-SOEs' ESG performance on the improvement of accounting information quality (Wang et al., 2022). [38] (3) In the view of stakeholders, the fulfillment of social responsibility by SOEs is an intrinsic requirement. Compared with non-SOEs, SOEs face higher public pressure and social expectations in terms of ESG performance, and the benchmarking effect is significant. As a result, SOEs tend to have higher external attention per se, and it is difficult for firms to engage in surplus manipulation and higher quality of accounting information. Therefore, for non-state-owned enterprises, the margin of enhancing ESG in improving accounting information quality is high relative to state-owned enterprises, and the enhancement effect is stronger. (4) SOEs have a strong correlation with the government. Because SOEs have the responsibility to develop the economy, maintain social stability, improve employment, protect the environment, etc., it is more advantageous for SOEs to obtain support from the government and state-owned banks, while SOEs do not have "blood relationship" with the government and state-owned banks, and usually need to pay a lot of rent-seeking costs to obtain resources. Therefore, compared with non-state-owned enterprises, state-owned enterprises themselves have lower economic pressure and surplus incentives. To summarize, the paper proposes the following hypotheses:

H3: Compared to SOEs, the enhancement effect of ESG performance on accounting information quality is stronger for non-SOEs.

At the industry level, it has been found that differences in the level of pollution in the industry in which a company operates can have a significant impact on the company's ESG performance (Yan, 2022; Sun, 2022; Liang and Xu, 2023) [39] [40] [41]. Compared to enterprises in low-pollution industries, highly polluting enterprises have greater incentives to practice ESG practices. Enterprises with high pollution levels have higher negative externalities in their production and operation activities, which can have a greater adverse impact on the environment and people's lives, and receive greater public attention and market response. "Green mountains are golden mountains", in today's era of more emphasis on ecological civilization construction as well as green development, highly polluting enterprises will face greater environmental protection pressure to save energy and reduce emissions, so the state and the public are more concerned about the performance of enterprises in heavily polluting industries in improving ESG. The heavy pollution industry's emphasis on ESG performance is conducive to creating an excellent image of green enterprises with greater marginal benefits, strengthening their long-term competitiveness, and having a more positive impact on improving the quality of corporate information. Therefore, this paper proposes the following hypotheses:

H4: The enhancement effect of ESG performance on accounting information quality is stronger for heavily polluting firms compared to non-heavily polluting firms.

3. Method

3.1. Data source

This paper selects China's A-share listed companies in Shanghai and Shenzhen from 2009 to 2021 as the research sample, and processes the obtained data as follows: exclude the samples of ST and *ST; exclude the samples with missing observations; exclude the samples of the financial industry, the real estate industry, and the companies with special treatment status; exclude the samples with

abnormal data, such as the total operating income is 0, the asset liability ratio is greater than 1, etc.; perform a 1% quartile WINSORIZE on all continuous variables. Finally, the unbalanced panel data of 3296 companies with 24254 sample observations are obtained. ESG data are taken from CSI ESG ratings in WIND database, and other data are obtained from CSMAR database. Data processing and analysis are mainly done by stata17.0.

3.2. Variables

3.2.1. Explained Variable: Quality of accounting information

Most scholars believe that corporate surplus management behavior often affects the quality of accounting information (Yuan et al., 2017; Wang and Wang, 2019; Ma et al., 2022) [42] [43] [44]. According to Xia (2002), it was found that using the modified Jones model to measure the quality of accounting information has better results [45]. Therefore, this paper uses the modified Jones model to calculate the manipulable accrued profit and takes its absolute value to measure the quality of accounting information. The solution process of $\mathrm{DA}_{\mathrm{n,t}}$ is as follows:

$$\frac{\mathrm{TA}_{\mathrm{n,t}}}{\mathrm{A}_{\mathrm{n,t-1}}} = \alpha_1 \times \frac{1}{\mathrm{A}_{\mathrm{n,t-1}}} + \alpha_2 \times \frac{\Delta\mathrm{REV}_{\mathrm{n,t}} - \Delta\mathrm{REC}_{\mathrm{n,t}}}{\mathrm{A}_{\mathrm{n,t-1}}} + \alpha_3 \times \frac{\mathrm{PPE}_{\mathrm{n,t}}}{\mathrm{A}_{\mathrm{n,t-1}}} + \varepsilon_{\mathrm{n,t}}$$

$$\mathrm{NDA}_{\mathrm{n,t}} = \alpha_1 \times \frac{1}{A_{n,t-1}} + \alpha_2 \times \frac{\Delta\mathrm{REV}_{\mathrm{n,t}} - \Delta\mathrm{REC}_{\mathrm{n,t}}}{\mathrm{A}_{\mathrm{n,t-1}}} + \alpha_3 \times \frac{PPE_{n,t}}{A_{n,t-1}}$$

$$\mathrm{DA}_{\mathrm{n,t}} = \left| \frac{TA_{n,t}}{A_{n,t-1}} - \mathrm{NDA}_{\mathrm{n,t}} \right|$$

Where $\mathrm{TA}_{\mathrm{n,t}}$ and $\mathrm{PPE}_{\mathrm{n,t}}$denote the total accrued profit and the original value of fixed assets at the end of the period for the n samples in period t, respectively; $\mathrm{A}_{\mathrm{n,t-1}}$denotes total assets at the end of the period for the n-sample in period t-1; $\Delta\mathrm{Rev}_{\mathrm{n,t}}$ and $\Delta\mathrm{REC}_{\mathrm{n,t}}$ denote the amount of change in business revenue and accounts receivable from year t-1 to year t for the n samples, respectively. $\mathrm{NDA}_{\mathrm{n,t}}$ is the non-manipulative accruals and $\mathrm{DA}_{\mathrm{n,t}}$ is the absolute value of the manipulable accruals included in the accruals.$\mathrm{DA}_{\mathrm{n,t}}$is inversely proportional to the quality of firms' accounting information. The larger the $\mathrm{DA}_{\mathrm{n,t}}$, the lower the level of firms' accounting information quality.

3.2.2. Explanatory Variable: ESG performance

Based on the existing research results, this paper adopts the ESG ratings of CSI from the WIND database to measure the ESG performance of companies (Gao et al., 2021; Wang et al., 2022; Wang and Guo, 2023) [46] [47] [48]. Compared with other ESG evaluation systems (e.g. Bloomberg, Shangdao Ronglv, Runling Global, etc.), CSI ESG Rating is characterized by its proximity to the Chinese market (based on the mainstream ESG development experience of foreign countries, and further combining with the characteristics of China's market), high timeliness (adopting a combination of quarterly periodic evaluation and dynamic tracking), and wide coverage (covering all A-share listed companies). The CSI ESG evaluation system combines the actual situation of the domestic market and constructs a three-level index system from top to bottom. The indicators are assigned values based on literature research, national standards, and data types, and the industry weight matrix is constructed with reference to Thomson Reuters' importance matrix for weight setting. Based on the environmental, social and governance scores, each dimension is weighted to calculate the total ESG score, and nine grades of ratings from C to AAA are finally obtained. This paper adopts the method of assignment, based on the above ratings, the nine ratings of C~AAA are assigned values from 1 to 9, thus obtaining the variable ESG.

3.2.3. Mediating variables: corporate reputation and financing constraints

For the mediating variable corporate reputation (Rep), most scholars believe that corporate reputation is a special intangible asset (Zhao, 2007; Zheng and Wang, 2009; Zhao, 2022 [49] [50] [51]. to existing studies, scholars basically use proxy variables to measure corporate reputation. Therefore, in the measurement of corporate reputation (Rep), this paper draws on the research of

Zhou et al. (2016) [52] scholars and adopts the logarithm of corporate intangible assets as a proxy variable to measure corporate reputation. This measure is not a fuzzy judgment based on stakeholders' perception and is more objective to a certain extent. for the mediating variable financing constraints (Kz), according to Kaplan and Luigi (1997) [53], financial information such as firms' net operating cash flows, dividends, cash holdings, gearing ratios, and Tobin's Q are synthesized into a single index called the KZ index, which serves as a proxy for measuring financing constraints. This approach has been widely adopted in subsequent studies by numerous scholars (Wei et al., 2014; Li and Huang, 2020; Gao et al., 2021) [54] [55] [56]. Therefore, this paper uses the KZ index as a proxy variable to measure corporate financing constraints.

3.2.4. Moderating variables: nature of ownership and nature of industry

For the nature of ownership (Soe), the sample enterprises are categorized according to the type of enterprise ownership in the basic information of the enterprises in the GuotaiAn database, and a dummy variable for the nature of ownership is constructed, assigning the value of 1 to non-SOEs and 0 to SOEs, to study the impact of the ESG performance of enterprises on the quality of accounting information in different ownerships. For the nature of industry (Wr), by combining the Guidelines on Industry Classification of Listed Companies (2012), the solicitation draft of Guidelines on Environmental Information Disclosure of Listed Companies issued by the Ministry of Environmental Protection (MEP) in 2010, as well as the identification of heavy polluting industries in the "Listed Company Environmental Verification Industry Classification and Management Directory" (Environmental Protection Letter [2008] No. 373) [19 - 20], and Referring to the study of Wang et al. (2022), we construct a dummy variable for industry nature [57], assigning 1 to heavily polluted industries and 0 to non-heavily polluted industries.

3.2.5. Control variables

Referring to the existing literature of Peng (2021) [58], Lijun Ma et al. (2022) [59] and Feng and Guo (2021) [60], this article controls multidimensional indicators that may affect the quality of corporate accounting information, covering the aspects of operation, profitability, and development. The variable definitions and descriptions are shown in detail in Table 1.

Table 1. Variable description

Type	Name	Symbol	Interpretation
Explained Variable	Quality of accounting information	Da	Manipulation of the absolute value of accrued profits under the modified Jones model
Explanatory Variable	ESG performance	ESG	CSI ESG ratings are assigned from 1-9 from low to high
Mediating Variable	Financing constraints	Kz	Calculation of KZ Index
	Corporate Reputation	Rep	Logarithm of intangible assets
Moderating variables	Nature of property rights	Soe	1 for non-state-owned, 0 for state-owned
	Nature of industry	Wr	Heavily polluted industries take 1, non-heavily polluted industries take 0
Control Variable	Scale of enterprise	Size	Natural logarithm of total assets at the end of the year
	Shareholding Ratio of the Largest Shareholder	Top	Shareholding ratio of the first largest shareholder
	Size of Board of Directors	Board	Logarithm of the number of board of directors

	Percentage of Independent Directors	Indep	Percentage of independent directors
	Whether the auditor is an international Big 4 auditor	Big4	International Big Four Audit Institutions take 1, otherwise 0
	Operating Cash Flow	Cash	Net cash flow to total assets ratio
	Company Growth	Grpwth	Operating income growth rate
	Two jobs in one	Dual	Chairman and General Manager are the same person take 1, otherwise 0
	Book-to-market ratio	Bm	Book-to-market ratio
	Time effect	Year	Year dummy variable
	Industry effect	Indusry	Industry dummy variables; SEC 2012 industry classification, manufacturing industry takes two codes, other industries use broad categories

3.3. Empirical Model

Examining the mechanism of the impact of ESG rating performance on the quality of corporate accounting information requires empirical testing of the above hypotheses. The following model is developed:

$$Da_{i,t}=\beta_0+\alpha_0 ESG_{i,t}+\sum Control_{i,t}+\text{Year}+\text{Industry}+\text{Company}+\varepsilon_{i,t} \quad (1)$$

$$Kz(Cf)_{i,t}=\beta_1+\alpha_1 ESG_{i,t}+\sum Control_{i,t}+\text{Year}+\text{Industry}+\text{Company}+\varepsilon_{i,t} \quad (2)$$

$$Da_{i,t}=\beta_2+\alpha_2 Kz(Cf)_{i,t}+\alpha_3 ESG_{i,t}+\sum Control_{i,t}+\text{Year}+\text{Industry}+\text{Company}+\varepsilon_{i,t} \quad (3)$$

$$Da_{i,t}=\beta_3+\alpha_4 ESG_{i,t}+\alpha_5 Soe_{i,t}+\alpha_6 ESG_{i,t}\times Soe_{i,t}+\sum Control_{i,t}+\text{Year}+\text{Industry}+\text{Company}+\varepsilon_{i,t} \quad (4)$$

$$Da_{i,t}=\beta_4+\alpha_7 ESG_{i,t}+\alpha_8 Wr_{i,t}+\alpha_9 ESG_{i,t}\times Wr_{i,t}+\sum Control_{i,t}+\text{Year}+\text{Industry}+\text{Company}+\varepsilon_{i,t} \quad (5)$$

In model (1), the explanatory variable is accounting information quality (Da), and the explanatory variable is corporate ESG performance (ESG), while controlling for year fixed effects, industry fixed effects and individual fixed effects, and controlling for factors such as enterprise size, board size, percentage of independent directors, percentage of shares held by the first largest shareholder, company growth, and cash flow from operations, and if corporate ESG performance (ESG) regression coefficient is significantly negative, then it proves that corporate ESG performance has a positive impact on accounting information quality. Mediation effect analysis is used to verify H1 and H2 using model (1), model (2) and model (3), i.e., to examine whether financing constraints and corporate reputation play a mediating effect. For models (4) and (5), the interaction terms of firms' ESG performance (ESG) and nature of property rights (Soe) as well as the interaction terms of firms' ESG performance (ESG) and nature of industry (Wr) are introduced to test H3 and H4, i.e., to examine the moderating effects of the nature of firms' property rights and nature of the industry, and the expected coefficients of the interaction terms are significantly negative.

4. Empirical Results and Discussion

4.1. Descriptive statistics

The results of descriptive statistics of variables are shown in Table 2. From the table, the mean value of the quality of accounting information of the sample enterprises is 0.0567, the standard deviation is 0.0590, the maximum value is 0.3186, and the minimum value is 0.0006, which indicates

that there is room for improvement in the level of the quality of the accounting information of the sample enterprises. About the ESG ratings, the mean value of the ESG is 4.1078, the standard deviation is 0.9462, the maximum value is 8.0000, the minimum value The mean ESG rating is 4.1078, the standard deviation is 0.9462, the maximum value is 8.0000, the minimum value is 8.0000, and the median is 4.0000, which indicates that the average ESG rating of the sample firms ranges from B to BB. However, the standard deviation of the ESG data is large, which suggests that there is a large difference in the ESG performances of the sample firms, which is conducive to better serving the hypotheses put forward in this paper. In terms of corporate governance, the average Top1 shareholding ratio of the first largest shareholder is 34.23%, and the shareholding of listed companies is relatively concentrated; the mean value of Indep share of independent directors is 37.43%, which is larger than the requirement of the SEC that the board of directors should include at least 1/3 independent directors; the mean value of Big4 is 0.0591 indicating that the vast majority of the companies are not audited by the Big 4 (PwC, Deloitte, KPMG, EY) audits; the mean value of Dual is 0.2594, indicating that more than a quarter of the sample has both positions. Overall, the dependent variable, independent variables and other firm-level control variables all show large variability, representing a wide range of variable selection in this paper.

Table 2. Variable description

variable	N	Mean	SD	Min	Max	p25	p50	p75
Da	24254	0.0567	0.0590	0.0006	0.3186	0.0173	0.0389	0.0737
ESG	24254	4.1078	0.9462	1.0000	8.0000	3.5000	4.0000	4.7500
Kz	24254	1.0470	2.3056	-5.7061	6.1662	-0.2866	1.2891	2.5889
Rep	24254	8.1526	0.7183	6.0939	10.1234	7.7285	8.1362	8.5612
Size	24254	9.6616	0.5390	8.6919	11.3228	9.2762	9.5883	9.9675
Top1	24254	0.3423	0.1455	0.0923	0.7382	0.2297	0.3200	0.4376
Board	24254	2.1353	0.1981	1.6094	2.7081	1.9459	2.1972	2.1972
Indep	24254	0.3743	0.0527	0.3333	0.5714	0.3333	0.3333	0.4286
Big4	24254	0.0591	0.2359	0.0000	1.0000	0.0000	0.0000	0.0000
Cash	24254	0.0505	0.0654	-0.1323	0.2380	0.0116	0.0482	0.0887
Grpwth	24254	0.1743	0.3791	-0.5016	2.3541	-0.0131	0.1129	0.2720
Dual	24254	0.2594	0.4383	0.0000	1.0000	0.0000	0.0000	1.0000
Bm	24254	0.6053	0.2470	0.1194	1.1652	0.4151	0.5972	0.7896

4.2. Correlation analysis

To conduct preliminary screening of variables and determine the problem of covariance, the correlation test is carried out in this paper. According to the test results, it can be found that the correlation coefficient between the independent variable ESG and the dependent variable Dais -0.0912, which is significant and negative at 1% level, which indicates that Dais negatively correlated with ESG, and as the rating of ESG is higher, the degree of surplus management of enterprises is lower, and the quality of accounting information of enterprises is higher. That is, ESG performance can improve the quality of accounting information, which can initially support the hypothesis of this paper. From the correlation coefficient of ESG and Kz (-0.1999) and the correlation coefficient of Kz and Da (-0.0914), ESG and Kz show negative correlation, and Kz and Da show positive correlation, which indicates that ESG can improve the quality of accounting information by alleviating the financing constraints, and initially verifies the hypothesis H1. from the correlation coefficient of ESG and Rep (-0.1652) and the correlation coefficient of Rep and Da (-0.1152), the hypothesis H1 is supported by the hypotheses of this paper. From the correlation coefficient of ESG and Rep (0.1652) and the correlation coefficient of Rep and Da (-0.1132), ESG is positively correlated with Rep, and Rep is negatively correlated with Da, which indicates that ESG can improve the quality of accounting information through improving corporate reputation, and initially verifies the hypothesis H2. At the same time, all the coefficients of the correlation matrix have an absolute value of less than 0.8, which initially confirms that there is no problem of multiple covariations among the variables.

4.3. Regression analysis

The regression results of the mechanism of ESG influence on the quality of corporate accounting information are shown in Table 3. Column (1) of Table 3 shows that the ESG coefficient is -0.0045 and it passes the 1% significance level test. This shows that good ESG can improve the quality of accounting information, thus supporting the hypothesis of this paper. Columns (2) through (5) further test the specific mechanisms behind firms' ESG performance to improve the quality of firms' accounting information.

The ESG coefficient of -0.1834 in column (2) is significantly negative at the 1% level, indicating that good ESG can reduce the Kz index and alleviate financing constraints. The coefficient of Kz in column (3) is 0.0009 significantly positive at the 1% level, indicating that severe financing constraints reduce the quality of corporate accounting information. Meanwhile the coefficient of the core explanatory variable ESG remains significantly negative at the 1% level and the coefficient size does not change significantly from column (1), which can further conclude the existence of incomplete mediation effect.

Table 3. ESG Performance and Accounting Information Quality - Estimation of Main and Mediating Effects

VARIABLES	(1)	(2)	(3)	(4)	(5)
	m1	m2	m3	m4	m5
	Da	Kz	Da	Rep	Da
ESG	-0.0045***	-0.1834***	-0.0043***	0.0112***	-0.0044***
	(-7.5525)	(-14.0426)	(-7.2454)	(3.5700)	(-7.4710)
Kz			0.0009***		
			(2.8203)		
Rep					-0.0043***
					(-3.2754)
Size	0.0019	0.3617***	0.0016	0.9342***	0.0060**
	(0.7890)	(6.6599)	(0.6584)	(71.8162)	(2.1647)
Top1	-0.0062	-0.8484***	-0.0054	0.0535	-0.0059
	(-0.9275)	(-5.8061)	(-0.8136)	(1.5295)	(-0.8930)
Board	-0.0002	-0.3503***	0.0001	0.0117	-0.0001
	(-0.0412)	(-3.6527)	(0.0301)	(0.5075)	(-0.0297)
Indep	0.0217	-0.3810	0.0220*	0.0283	0.0218
	(1.6203)	(-1.2953)	(1.6458)	(0.4023)	(1.6298)
Big4	0.0021	-0.1189	0.0022	0.0134	0.0022
	(0.5501)	(-1.4074)	(0.5776)	(0.6622)	(0.5652)
Cash	-0.0419***	-16.0572***	-0.0276***	0.0421	-0.0417***
	(-5.8653)	(-102.2209)	(-3.1597)	(1.1202)	(-5.8411)
Grpwth	0.0094***	-0.4268***	0.0098***	-0.0125**	0.0093***
	(8.9306)	(-18.4834)	(9.2178)	(-2.2587)	(8.8804)
Dual	0.0002	-0.0832***	0.0003	-0.0034	0.0002
	(0.1621)	(-2.7880)	(0.2165)	(-0.4775)	(0.1513)
Bm	-0.0196***	-2.5024***	-0.0174***	0.0651***	-0.0193***
	(-6.4461)	(-37.3763)	(-5.5353)	(4.0624)	(-6.3530)
Constant	0.0196	0.6500	0.0190	-0.9291***	0.0156
	(0.3715)	(0.5597)	(0.3606)	(-3.3401)	(0.2958)
Observations	24,254	24,254	24,254	24,254	24,254
R-squared	0.0275	0.4337	0.0279	0.4111	0.0280
Year FE	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES
Company FE	YES	YES	YES	YES	YES

Note: *** p<0.01, ** p<0.05, * p<0.1, t-values in parentheses. Same below.

The coefficient of ESG in column (4) is 0.0112 significantly positive at 1% level, which indicates that good ESG can improve corporate reputation. The Rep coefficient in column (5) is -0.0043 is significantly negative at the 1% level, indicating that firms with good corporate reputation reduce corporate surplus management activities and improve the quality of corporate accounting information; the ESG coefficient stays significantly negative at the 1% level and the absolute value of the coefficient size decreases from 0.0045 when Rep is not added to 0.0044, i.e., the direct effect of ESG on improving the quality of corporate accounting information is smaller than its effect on the quality of corporate accounting information. That is, the direct effect of ESG on improving the quality of corporate accounting information is smaller than its total effect on the quality of accounting information, which side by side indicates that corporate reputation plays a part of the mediating effect in the influence of ESG on the quality of corporate accounting information.

In summary, corporate ESG performance can simultaneously improve the quality of corporate accounting information through the two mechanisms of alleviating financing constraints and improving corporate reputation, further verifying the hypotheses H1 and H2 of this paper.

4.4. Further analysis: heterogeneity test

In this paper, dummy variable cross-regression is used to perform heterogeneity analysis. To mitigate the high degree of covariance between the interaction term and the independent and moderating variables when performing moderated effects analysis, it is usually necessary to center the independent variables, and the above bias can be corrected through centering, without affecting the estimation of the model. The relevant results are listed in Table 4.

4.4.1. Property Rights Properties

This paper categorizes all samples into two groups, SOEs and non-SOEs, based on the property rights attributes of the firms' listed operations, and then examines whether there is a moderating effect of property rights attributes on the relationship between ESG performance and improved accounting information quality. The coefficient of the core explanatory variable ESG in column (1) is -0.0028 which is significantly negative at the 1% level and the cross term of the dummy variable of non-SOEs and ESG is significantly negative at the 5% level. This indicates that the nature of property rights affects the relationship between corporate ESG performance and accounting information quality, and the ESG performance of non-state-owned enterprises has a stronger effect on the improvement of accounting information quality, which further verifies the hypothesis H3 of this paper.

4.4.2. Nature of industry

According to Wang et al. (2022), "Heterogeneous Environmental Policies, Executive Risk Preferences and Green Technology Innovation: An Empirical Study Based on Heavily Polluted Listed Companies in China", this paper divides the sample enterprises into two groups: heavily polluted and non-heavily polluted industries, and then examines whether the nature of the industry has a moderating effect on the relationship between ESG performance and the improvement of accounting information quality. there is a moderating effect. The coefficient of the core explanatory variable ESG in column (2) is -0.0041, which is significantly negative at the 1% level, and the cross-sectional term of the dummy variable of heavy polluting firms and ESG is significantly negative at the 5% level. This indicates that the nature of the industry affects the relationship between firms' ESG performance and accounting information quality. That is, compared with non-heavily polluted firms, the ESG performance of heavily polluted firms has a stronger effect on the improvement of accounting information quality, which further validates the hypothesis H4 of this paper.

Table 4. Moderating effect of nature of ownership and industry type on ESG performance and accounting information quality

VARIABLES	(1)	(2)
	m1	m2
	Da	Da
ESG	-0.0028***	-0.0041***
	(-3.0689)	(-6.5349)
Soe	0.0051	
	(0.9700)	
ESG×Soe	-0.0027**	
	(-2.3441)	
Wr		0.0110**
		(2.4203)
ESG×Wr		-0.0025**
		(-2.3071)
Size	0.0018	0.0019
	(0.7428)	(0.7895)
Top1	-0.0049	-0.0062
	(-0.7343)	(-0.9387)
Board	-0.0007	-0.0002
	(-0.1493)	(-0.0489)
Indep	0.0216	0.0216
	(1.6126)	(1.6194)
Big4	0.0024	0.0021
	(0.6340)	(0.5498)
Cash	-0.0417***	-0.0417***
	(-5.8460)	(-5.8439)
Grpwth	0.0094***	0.0094***
	(8.9818)	(8.9568)
Dual	0.0004	0.0002
	(0.3003)	(0.1737)
Bm	-0.0196***	-0.0197***
	(-6.4554)	(-6.4699)
Constant	0.0182	0.0186
	(0.3443)	(0.3519)
Observations	24,254	24,254
R-squared	0.0279	0.0278
Year FE	YES	YES
Industry FE	YES	YES
Company FE	YES	YES

4.5. Robustness Analysis

In order to enhance the reliability of the research findings, this paper conducts a robustness test in terms of the Heckman test, key variable substitution, and transforming the way the model is set up.

4.5.1. Endogeneity: Heckman two-stage test

The number of enterprises issuing ESG reports in China has increased year by year in recent years, but a unified and authoritative ESG disclosure standard has not yet been formed in the country. Corporate ESG disclosure is based on voluntary disclosure, and when a company's ESG performance is good, the company may be more willing to disclose its ESG performance. For companies that do not disclose their ESG performance, data will not be available. Therefore, the research sample may suffer from sample selection bias. To reduce the interference of the endogeneity problem caused by

sample selection bias on the research conclusions, this paper adopts the Heckman two-stage modal to conduct the test.

In the first stage, the probit model is used to estimate the probability of corporate disclosure of ESG performance, and the Inverse Mills Ratio is calculated; in the second stage, the Inverse Mills Ratio derived from the first stage is added to the original regression equation, and then the regression parameters are estimated. Table 5 shows the results of Heckman's two-stage test, from the data in the table, the coefficient of Inverse Mills Ratio is not significant, which indicates that there is no serious sample selection bias problem in this paper. The ESG coefficient in column (2) of Table 5 is significantly negative at the 1% level, which shows that the findings of this paper remain unchanged after controlling for the inverse Mills ratio.

Table 5. Heckman two-stage test

VARIABLES	(1)	(2)
	m1	m2
	ESGHeck	Da
ESG		-0.0045***
		(-7.5169)
Size	0.1591***	0.0125
	(9.6873)	(0.8845)
Top1	0.1603***	0.0044
	(3.6119)	(0.2832)
Board	0.0156	0.0008
	(0.5338)	(0.1675)
Indep	0.4370***	0.0500
	(4.8966)	(1.2594)
Big4	0.0155	0.0031
	(0.6045)	(0.7649)
Cash	-0.0097	-0.0424***
	(-0.2040)	(-5.9104)
Grpwth	-0.0162**	0.0083***
	(-2.3021)	(4.6594)
Dual	-0.0318***	-0.0019
	(-3.5099)	(-0.6139)
Bm	0.0591***	-0.0156**
	(2.9038)	(-2.5277)
IMR		0.1428
		(0.7585)
Constant	-0.9316***	-0.1475
	(-2.6395)	(-0.6511)
Observations	24,254	24,254
R-squared	0.0253	0.0275
Year FE	YES	YES
Industry FE	YES	YES
Company FE	YES	YES

4.5.2. Replacement of the variables

1) Replacement of the Explained Variable

In the robustness test, this paper uses real surplus management to measure the quality of corporate accounting information. Referring to the Roychowdhury (2006) [61] model to measure the true level of surplus management of firms. The regression results are consistent with those of the previous paper, further supporting the original hypotheses H1, H2, H3, and H4.

2) Replacing measures of financing constraints

Since the KZ index includes many financial variables with endogeneity, such as cash flow, leverage, etc., in order to avoid endogeneity interference, Hadlock and Pierce (2010) use the explanatory variables that best reflect the characteristics of corporate financing constraints - firm size

(Size) and firm's age of establishment (Age), to constructed the SA index that reflects the degree of corporate financing constraints [62].Therefore, this paper adopts the SA index and takes the absolute value of the SA index to measure the enterprise financing constraints, and conducts the robustness test. the larger the absolute value of SA, the higher the degree of the enterprise's financing constraints. The regression results still support the hypothesis H1 of this paper.

3) Replacement of metrics for corporate reputation

The image of an enterprise is multifaceted and consists of many different elements of its image, making it difficult to measure the evaluation of corporate image by different market players through a single indicator. In the capital market, listed companies are required to publicly disclose to investors information about significant matters including corporate penalties. The announcement of corporate penalties is usually publicized on the official government website, which has a high degree of credibility. The number of times an enterprise is penalized will affect the image of the enterprise, and the more times the enterprise is penalized, the worse the image of the enterprise will be. Accordingly, based on the study of Zhu (2020) [63], this paper constructs a dummy variable to measure corporate reputation (CF) by whether the enterprise has been penalized in the past three years. Firms have been penalized within three years are assigned a value of 1, otherwise 0. The regression results are basically consistent with the previous regression results, indicating that the conclusion H2 drawn in the previous paper is robust.

4.5.3. Considering industry differences over time

Table 6. Controlling for industry changes over the year

VARIABLES	(1)	(2)	(3)	(4)	(5)
	m1	m2	m3	m4	m5
	Da	Kz	Da	Rep	Da
ESG	-0.0048***	-0.1857***	-0.0046***	0.0115***	-0.0047***
	(-8.1083)	(-14.0072)	(-7.7635)	(3.5699)	(-8.0149)
Kz			0.0010***		
			(3.1313)		
Rep					-0.0048***
					(-3.7169)
Size	-0.0008	0.2262***	-0.0011	0.9344***	0.0037
	(-0.3366)	(4.0293)	(-0.4254)	(68.4433)	(1.3107)
Top1	-0.0012	-0.5541***	-0.0006	0.0703**	-0.0008
	(-0.1791)	(-3.7640)	(-0.0961)	(1.9645)	(-0.1277)
Board	0.0008	-0.2987***	0.0011	0.0183	0.0009
	(0.1927)	(-3.1244)	(0.2616)	(0.7870)	(0.2133)
Indep	0.0215	-0.2017	0.0217*	0.0367	0.0217*
	(1.6316)	(-0.6867)	(1.6471)	(0.5131)	(1.6456)
Big4	0.0030	-0.0863	0.0031	0.0181	0.0031
	(0.7959)	(-1.0222)	(0.8186)	(0.8828)	(0.8193)
Cash	-0.0442***	-15.8538***	-0.0285***	0.0243	-0.0441***
	(-6.1794)	(-99.3731)	(-3.2683)	(0.6273)	(-6.1649)
Grpwth	0.0105***	-0.3826***	0.0109***	-0.0118**	0.0104***
	(9.9212)	(-16.2493)	(10.2151)	(-2.0633)	(9.8693)
Dual	-0.0001	-0.0643**	-0.0000	-0.0028	-0.0001
	(-0.0774)	(-2.1637)	(-0.0297)	(-0.3859)	(-0.0875)
Bm	-0.0156***	-2.5809***	-0.0131***	0.0562***	-0.0153***
	(-4.9285)	(-36.5485)	(-3.9934)	(3.2746)	(-4.8430)
Constant	0.0445	1.8906	0.0427	-0.8994***	0.0402
	(0.7750)	(1.4763)	(0.7425)	(-2.8884)	(0.6995)
Observations	24,254	24,254	24,254	24,254	24,254
R-squared	0.1227	0.4756	0.1231	0.4381	0.1233
Year FE	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES
Company FE	YES	YES	YES	YES	YES
Industry×Year FE	YES	YES	YES	YES	YES

Due to the existence of unobservable at the industry level over time, this paper further considers the robustness of industry variation over time by introducing the interaction term of industry fixed effects and time fixed effects, the results of which are shown in Tables 6, -7. From the results of the robustness tests, there is no substantial change in the regression results and the robustness of the original conclusions is confirmed.

Table 7. Controlling for industry changes over the year - Estimated results of the heterogeneity test

VARIABLES	(1)	(2)
	m1	m2
	Da	Da
ESG	-0.0033***	-0.0045***
	(-3.6102)	(-7.2595)
Soe	0.0058	
	(1.1129)	
ESG×Soe	-0.0024**	
	(-2.1065)	
Wr		0.0079*
		(1.7507)
ESG×Wr		-0.0018*
		(-1.7238)
Size	-0.0009	-0.0008
	(-0.3560)	(-0.3277)
Top1	-0.0003	-0.0012
	(-0.0505)	(-0.1886)
Board	0.0005	0.0008
	(0.1153)	(0.1856)
Indep	0.0213	0.0216
	(1.6138)	(1.6361)
Big4	0.0033	0.0030
	(0.8585)	(0.7883)
Cash	-0.0441***	-0.0441***
	(-6.1606)	(-6.1615)
Grpwth	0.0105***	0.0105***
	(9.9634)	(9.9350)
Dual	0.0000	-0.0001
	(0.0097)	(-0.0682)
Bm	-0.0156***	-0.0157***
	(-4.9299)	(-4.9516)
Constant	0.0419	0.0435
	(0.7289)	(0.7567)
Observations	24,254	24,254
R-squared	0.1230	0.1228
Year FE	YES	YES
Industry FE	YES	YES
Company FE	YES	YES
Industry×Year FE	YES	YES

5. Conclusion

ESG, as a comprehensive non-financial indicator measuring the specific effectiveness of the three aspects of environment, society and corporate governance, to a certain extent reflects the long-term development capability of enterprises and provides more investment information for the market, so the performance of enterprises in ESG is highly concerned. Meanwhile, high-quality accounting information disclosure is an important way to realize the communication between investors and enterprises, which plays a key role in the development of modern market economy. Based on this, this paper selects China's A-share listed companies in Shanghai and Shenzhen from 2009 to 2021 as the research sample, and examines the impact effect and mechanism of corporate ESG performance

on improving the quality of accounting information. This paper obtains the following main conclusions: (1) Corporate ESG performance can improve the quality of corporate accounting information. (2) The mechanism test shows that corporate ESG performance can act on corporate accounting information quality by alleviating corporate financing constraints and improving corporate reputation. (3) Further analysis reveals that the positive impact of ESG performance on accounting information quality is more obvious for non-state-owned enterprises and enterprises in high-pollution industries. The above conclusions still hold after a series of robustness tests dealing with endogeneity issues, replacing variable measures and considering industry changes over time. Based on the above findings, the following policy recommendations can be obtained:

5.1. For enterprises

Enterprises should not only see one-sidedly the increase in costs due to the assumption of environmental and social responsibility and improvement of corporate governance, but also see the positive impact of actively practicing ESG on the long-term development of the company, especially in terms of the improvement of the quality of accounting information. Enterprises should fully integrate ESG into their strategic planning, build an ESG governance structure suitable for their development, fully implement ESG concepts into all aspects of their operations and management, and incorporate ESG into their comprehensive rating system, set up corresponding assessment indicators, rewards and punishment policies, to obtain the double dividends of economic and social values and realize a "win-win situation". "The enterprise should also take the initiative to strengthen the disclosure of ESG information. Enterprises should also take the initiative to strengthen ESG information disclosure, refer to the ESG scores obtained to solve the problems of enterprises, and improve the ESG performance of enterprises, to promote the improvement of enterprise quality such as the quality of accounting information.

Considering that the enhancement of ESG practices by non-state-owned enterprises (NSOEs) and enterprises in heavily polluted industries has a more obvious effect on the enhancement of corporate information quality, NSOEs and heavily polluted enterprises should actively participate in environmental protection, actively fulfill their social responsibilities, and proactively improve their corporate governance model in order to win the favor of investors, improve their corporate reputations, alleviate financing constraints, and gain a competitive advantage to achieve the company's goal of long-term development.

5.2. For the government and regulators

For the government, due to the unsound ESG disclosure system in China, the quality of corporate ESG disclosure varies and ESG rating information is difficult to obtain quickly. Therefore, the government should improve and perfect the legislation related to corporate ESG and promulgate relatively uniform and complete ESG disclosure guidelines for listed companies, to continuously improve the scope and quality of corporate ESG disclosure and further promote the quality of corporate accounting information. The government should also provide incentives and penalties according to the ESG performance of enterprises, and support enterprises with good ESG performance through tax exemptions and the issuance of green credits to encourage ESG-related activities; and penalize enterprises with poor ESG performance by including them in negative lists, administrative notifications, and raising loan interest rates to increase the cost of ESG malpractices and false performances. Encourage and support third-party rating agencies to continuously improve ESG assessment methods, follow the international trend of ESG development and build an ESG rating system with Chinese characteristics, so that ESG can effectively play the role of soft market regulation. For regulators, ESG-related regulators should strengthen supervision, improve the regulatory system, and strengthen the role of administrative guidance in various aspects, so that ESG disclosure can become an important part of corporate disclosure, to improve corporate quality such as the quality of corporate accounting information, and create a better investment environment for investors.

5.3. For investors

In addition to paying attention to the financial information of enterprises, investors should also pay attention to the non-financial information of enterprises on environmental, social and governance aspects, recognize the importance of the ESG performance of enterprises to the quality of accounting information of enterprises, and incorporate the ESG performance of enterprises into the framework of investment decision-making. Since ESG performance reflects, to a certain extent, a company's ability to develop over the long term, investors are expected to obtain better sustainable returns by investing in companies with good ESG performance. At the same time, investors will tilt their resources to enterprises with good ESG performance, which is conducive to optimizing resource allocation, transforming ESG performance into the allocation of actual resources, forming a positive feedback mechanism, promoting enterprises to disclose their ESG performance on their own, and allowing funds to flow continuously among "green" enterprises to achieve green and sustainable development.

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