

# Corporate ESG Performance and Accounting Information Quality

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**Abstract.** This paper empirically examines the impact of ESG rating performance on the quality of corporate accounting information with 10015 listed companies in China's A-share market from 2012 to 2021. The results show that the better the ESG rating performance, the lower the level of real surplus management and the higher the quality of accounting information. Mechanism analysis shows that corporate ESG performance improves accounting information quality by reducing financing constraints and reducing information asymmetry. Heterogeneity analysis finds that the contribution of corporate ESG performance to accounting information quality is more significant in non-state-owned enterprises, non-polluting industry enterprises, enterprises in the eastern region. The research in this paper reveals the promotion effect of ESG on accounting information quality and provides a reference for the research on ESG in China.

**Keywords:** ESG; Accounting Information Quality; Financing Constraints; Information Asymmetry.

## 1. Introduction

ESG is a collective term for environmental, social and corporate governance, an evaluation system that reflects the three dimensions of environment, society and governance. Since it was formally proposed by the United Nations in 2004, it has received great attention from all walks of life. In order to promote enterprises to actively practice the ESG concept, regulators have successively issued relevant policies to regulate the disclosure of ESG information of listed companies, such as the "Governance Guidelines for Listed Companies" (Revised Edition) issued by the China Securities Regulatory Commission (CSRC) in 2018, which for the first time put forward the basic framework of ESG disclosure of listed companies, and the "Guidelines on the Contents and Format of Disclosure of Information of Companies Issuing Securities in Public Issue No. 2" issued in 2021 with amendments --Content and Format of Annual Report", which added new requirements on disclosure of corporate environmental, social responsibility and corporate governance information. At present, China is in the process of exploring green and low-carbon transformation, and enterprises, as the main participants of the real economy, greatly influence the quality and speed of China's economic development. ESG concepts in this context are particularly suitable for China's economic development to move to the fast lane, and provide a new way to promote economic and social transformation and realize the national "carbon peak, carbon neutral" dual-carbon goal. It provides a new approach to promoting economic and social transformation and realizing the national "carbon peak and carbon neutral" goal, and is an effective tool for realizing high-quality economic development. Compared with the traditional concept of aiming at short-term business results, ESG concept advocates long-term economic benefits and sustainable returns for enterprises.

With the growing importance of ESG, the quality of accounting information in China's capital market has also put forward higher requirements. The quality of accounting information is an important index for evaluating the accounting information of enterprises, however, China's capital market is still characterized by many problems such as serious information opacity and low transmission efficiency (Wu Lianghai et al. 2016), and surplus management is precisely one of the representative problems. Enterprise management, out of different motives, carries out surplus management through policy choices or control of economic operations to regulate accounting profits, which seriously reduces the quality of accounting information (Ning Yaping et al. 2004), which may not only mislead investors to make decisions, but also affect the healthy development of the capital market. In recent years, due

to increasing regulation, real surplus management has become the main means for management to manipulate financial information due to its stronger concealment (Peng Yazhe and Wang Changyun, 2022). With the rise of ESG concept, its governance effect on surplus management should not be ignored, and studies have confirmed that ESG plays an important role in reducing information asymmetry (Tan and Zhu, 2022), and helps firms to implement the concept of sustainable development, enhance the relationship with stakeholders, and improve corporate performance (Li Jinglin et al., 2021).

The current literature on ESG performance mainly focuses on financing constraints (Hongyan Xu et al., 2023) and enterprise value (Linlin Wang et al., 2022). However, there is little literature on the impact of ESG on the quality of accounting information, and the few relevant papers that have been published on the relationship between ESG and accrued surplus management have mostly focused on foreign firms (Pathak and Gupta, 2022) and lacked the exploration of the corresponding impact mechanisms and moderating effects. However, unlike foreign capital markets, the Chinese capital market, due to its special institutional influence on firms, has seen more and more Chinese firms tend to manipulate financial information by adopting real surplus management, ignoring the real surplus management that is widely used by Chinese firms at present, and it is insufficient to simply examine the impact of ESG on accrual surplus management. Therefore, in order to comprehensively analyze the impact of ESG on the quality of accounting information in China's institutional environment, this paper takes Chinese A-share listed companies from 2012 to 2021 as the research object and examines the impact of ESG rating performance on the quality of corporate accounting information. It is found that good ESG performance of firms positively affects accounting information quality. Through a series of robustness tests such as replacing the explanatory and interpretive variables and dealing with endogeneity issues, the conclusion still holds. The paper also finds that corporate ESG performance affects accounting information quality through two paths: alleviating financing constraints, reducing information asymmetry. In addition, the study finds that the contribution of corporate ESG performance to accounting information quality is more significant among non-state-owned firms, firms in non-polluting industries, firms in the eastern region.

Compared with the existing literature, the contribution of this paper is mainly reflected in the following three aspects: first, unlike previous literature that examines the relationship between corporate ESG performance and financing constraints (Yi Xiuqin et al., 2023), firm value (Wang Linlin et al., 2022), and investment efficiency (Hou Qiaoming et al., 2023), this paper supplements and analyzes the impact of ESG performance on true surplus management, which contributes to a comprehensive understanding of corporate relationship between ESG performance and accounting information quality, enriching the literature in the field of ESG performance related areas. Second, compared with the literature on corporate ESG performance and accounting information quality, this paper tries to elaborate the relationship between corporate ESG performance and accounting information quality by using the sustainable development theory, signaling theory and stakeholder theory at the theoretical level, and verifies that corporate ESG performance affects the quality of accounting information by alleviating the financing constraints and reducing the asymmetry of information, which enriches the mechanism of the relationship between ESG performance and accounting information quality. Third, this paper analyzes the relationship between ESG performance and accounting information quality from the perspectives of property rights, region, and region. Thirdly, this paper analyzes the heterogeneity in terms of property rights, region, marketization degree, pollution degree, and competition intensity, which is of practical significance for the implementation of the "dual-carbon" policy in the capital market.

## **2. Theoretical Analysis and Research Hypothesis**

### **2.1. ESG Performance and Quality of Accounting Information**

According to the theory of sustainable development, ESG ratings represent the extent to which a company fulfills its responsibilities in three areas: environmental, social and corporate governance.

From the environmental (E) point of view, good environmental performance means that the enterprise actively responds to the government's "carbon peak" and "carbon neutral" call to reduce pollution emissions; from the social responsibility (S) point of view, the enterprise's active social responsibility not only indicates that the enterprise responds to the government's relevant policies, but also means that the enterprise has closer ties with consumers, suppliers and other subjects, which is conducive to long-term development. From the perspective of social responsibility (S), the active undertaking of social responsibility by enterprises not only indicates that they have responded to relevant government policies, but also implies that they have closer ties with consumers, suppliers and other subjects, which is conducive to long-term development; from the perspective of corporate governance (G), the good level of governance of enterprises indicates that the internal governance mechanism of the enterprise is more perfect, and the management system is relatively mature, which is conducive to the enrichment of human resources as the talent pool of the enterprise. As a non-financial comprehensive rating system, the ESG rating system reflects the comprehensive ability and long-term development ability of the enterprise, and enterprises with good ESG performance usually have a better code of conduct due to actively responding to the national policy and macroeconomic situation, paying attention to the outside world and the enterprise's own image, and their risk management system is more complete, and they are able to identify and respond to the environmental, social responsibility and governance risks of the enterprise's operation, thus harming the stakeholders' interests, and thus reducing the risks. and governance risks, so there are fewer surplus management activities that harm the interests of stakeholders, and at the same time, enterprises actively practicing the ESG concept usually pay more attention to future sustainable development and the realization of long-term value (Huang Shizhong et al., 2021), which tends to avoid the conflict between short-term and long-term interests, reduce the short-sighted behavior that is detrimental to the long-term development of the enterprise, reduce fraud and other activities, and thus improve the quality of the accounting information disclosed by the enterprise. quality of accounting information.

According to signaling theory, the active fulfillment of ESG responsibilities by enterprises can send a positive signal to the outside, help enterprises establish a good corporate reputation and image to obtain the support and trust of stakeholders, and bring powerful advantages such as financing convenience and image enhancement to enterprises, thus occupying a favorable position in the market and bringing about the enhancement of business performance, and the motivation of management to manipulate surplus management to reduce the quality of accounting information will also be further reduced (Luo Jinhui and Wu Yilong, 2021). When the enterprise faces the impact of unfavorable events, due to the foundation of good cooperation and trust, stakeholders will give more support to the enterprise to help it tide over the difficulties, which reduces the opportunistic behavior of the enterprise management and improves the quality of its accounting information.

According to the stakeholder theory, the fulfillment of ESG responsibilities by enterprises can promote the communication between enterprises and external stakeholders, help enterprises to establish and maintain long-term and stable ties with them, and improve the development ability of enterprises and thus improve the quality of their accounting information. The fulfillment of ESG responsibility also helps to alleviate the information asymmetry between enterprises and stakeholders, reduce agency costs, improve operational efficiency, reduce fraud and other activities to improve the quality of accounting information. Resource dependence theory points out that resources are the key to corporate success, and good ESG performance can help enterprises gain the trust and support of stakeholders, acquire key strategic resources needed for sustainable development, form competitive advantages, and improve corporate efficiency. With the application and practice of ESG concepts in the context of "carbon peak" and "carbon neutrality", listed companies with good ESG performance will inevitably attract more external attention, and under the external supervision of the government, financial institutions and the public, the room for management to manipulate surplus management will be further reduced. Under the external supervision of the government, financial institutions, the public and so on, the space for management to manipulate surplus management will be further reduced, and rational corporate management will relatively reduce the opportunistic tendency and

provide higher quality accounting information to the outside world. Summarizing the above analysis, this paper puts forward the hypothesis:

H1: Corporate ESG performance improves the quality of a firm's accounting information.

## **2.2. Corporate ESG Performance, Financing Constraints and Accounting Information Quality**

The motivation of corporate management to engage in real surplus management is mostly related to financing constraints and performance pressure. On the one hand, due to the phenomenon of information asymmetry, the cost of external financing is higher than the cost of internal financing, and in order to reduce the financing constraints, corporate management usually engages in positive surplus management to raise funds (Zhou, Xiaosu et al., 2016). On the other hand, under greater performance pressure, corporate management will also engage in more surplus manipulation activities.

According to the classical theory of financing constraints, a higher degree of financing constraints will inhibit the sustainable development of an enterprise. According to the signaling theory, good ESG performance can transmit the signal of "enterprises actively fulfilling their environmental, social and corporate governance responsibilities" to the outside world, alleviate the information asymmetry between enterprises and investors and other stakeholders, and easily gain the trust and support of external investors for the enterprise, which will help the enterprise to obtain more financial support. This will help enterprises obtain more financial support, thereby alleviating financing constraints, realizing sustainable development of enterprises, reducing the level of corporate surplus management, and improving the quality of accounting information. In addition, positive ESG performance helps enterprises obtain additional financial support such as government grants and green credit. Li Zhibin et al. (2022) find that good ESG rating performance can alleviate corporate financing constraints. Yuan Yehu and Xiong Xiaohan's (2021) study also confirms that firms with superior ESG rating performance have better performance levels. Therefore, with the alleviation of financing constraints and performance pressure, the level of true surplus management of firms will be reduced accordingly to improve the quality of their accounting information. To summarize, the better the ESG performance of the enterprise, the more it helps the enterprise to improve the availability of funds, reduce the cost of funds, increase the future cash flow of the enterprise, thus reducing the level of surplus management and improving the quality of accounting information. Therefore, this paper proposes the hypothesis:

H2: Corporate ESG performance improves the quality of accounting information by alleviating financing constraints.

## **2.3. Corporate ESG Performance, Information Asymmetry and Accounting Information Quality**

According to existing research, Wu Lianghai et al. (2016) empirically examined the relationship between the level of information asymmetry and firms' investment efficiency in China's capital market and found that it inhibits firms' investment efficiency, and the degree of inhibition increases with the increase of risk. Media attention (Li Xiaohui and Yang Kun, 2015), internal control (Hao Dongyang and Han Ying, 2018), etc. can inhibit management's manipulation of surplus management, thus reducing the level of information asymmetry. In addition, some scholars have also studied manipulable accrual surplus management as a measure of the level of information asymmetry based on the Modified Jones model and the manipulable accrual surplus management calculated by Lu Jianqiao (1999) model. However, most of the academic research in this area focuses on exploring the influencing factors of information asymmetry and its consequences, and seldom links it to ESG responsibility performance. Based on stakeholder theory, it is believed that the ESG performance of an enterprise demonstrates how well the enterprise fulfills its environmental, social and corporate governance responsibilities, and provides another channel for stakeholders other than the

management to understand the enterprise's operation and management level and performance, which alleviates the information asymmetry between the enterprise and stakeholders to a certain extent, and the management will reduce the level of surplus management and thus improve the accounting performance of the enterprise under the pressure of more external attention. Management will reduce the level of surplus management under the pressure of more external attention, thus improving the quality of accounting information of the enterprise.

Based on the theory of sustainable development, companies with better ESG performance will continue to maintain or pursue better ESG performance, improve their disclosure system and strengthen internal risk management according to the existing evaluation standards (Xiaofang et al., 2021), which will generate a virtuous cycle of ESG performance, thus obtaining sustainable competitiveness, further reducing risks, and realizing stable growth in operating performance, with relatively less pressure on the performance of corporate management, less incentive for surplus management, less information asymmetry, and improved quality of accounting information. Therefore, this paper proposes the hypothesis:

H3: Firms' ESG performance positively affects accounting information quality by reducing information asymmetry.

### **3. Research Design**

#### **3.1. Sample Selection**

In this paper, the A-share listed companies in Shanghai and Shenzhen from 2012 to 2021 are selected as the initial sample, and the sample is screened according to the following criteria: (1) financial industry companies are excluded; (2) ST, \*ST, and PT companies are excluded; (3) samples with missing data are excluded; and (4) in order to avoid the influence of extreme values on the results, all continuous variables are subjected to the upper and lower 1% shrinking tail treatment, and finally we get 10015 sample observations. The ESG performance data of companies used in this paper are from Wind database, and the rest of the company financial data and industry characteristics data are from CSMAR database.

#### **3.2. Definition of Variables**

##### **3.2.1. Dependent Variable: Quality of Accounting Information**

Existing studies show that enterprises are more inclined to implement true surplus management in the face of insufficient accounting flexibility and strict external regulation (Li Bin et al., 2011), and with the increasing improvement of China's accounting standards and the strengthening of regulation, there is less and less room for enterprises to manipulate the management surplus of accrued items, so it is more likely that listed companies will achieve their goals by manipulating true activities. Therefore, this paper selects the degree of real surplus management (*Acq*) as a proxy variable for the quality of accounting information, drawing on the research model of Dechow (1998), Roychowdhury (2006) to measure the level of real surplus management of enterprises, the higher the quality of the company's accounting information, the lower the degree of real surplus management.

##### **3.2.2. Dependent Variable: Firms' ESG Performance**

At present, a number of domestic organizations have released ESG rating data of Chinese listed companies, such as CSI, Bloomberg, ShangDao RongLu, RunLing Global, etc. Compared with other data organizations, the ESG rating data released by CSI covers a wide range and a long time span, and refers to the international mainstream rating framework, and combines with the characteristics of China's capital market to measure all the A-share listed companies since 2009, and the CSI ESG rating system can make the data collection of this study more representative and reliable. The CSI ESG rating system can make the data collection of this study more representative and reliable. Therefore, this paper selects the composite score disclosed in the CSI ESG rating report as a proxy

variable to measure the ESG performance of enterprises, and the higher the value represents the better ESG performance of enterprises.

### 3.2.3. Mediating Variables: Financing Constraints

In existing studies, the indicators for measuring financing constraints mainly include SA index, WW index, and KZ index, among which SA index only includes variables that do not change much over time and are strongly exogenous, such as enterprise size and the number of years of enterprise establishment, etc. Therefore, this paper refers to the SA index constructed by Hadlock and Pierce (2010), and draws on the practice of Jou et al. (2013), adopting the SA index's The absolute value (Sa) measures the degree of financing constraints on firms, and the larger the value is, the higher the degree of financing constraints on firms. The specific measurements of the SA index are as follows:

$$SA = -0.737 \times Size + 0.043 \times Size - 0.040 \times Age$$

Where Size represents the natural logarithm of the firm's total asset size and Age represents the difference between the year of observation and the year of the firm's establishment.

### 3.2.4. Mediating Variables: Level of Information Asymmetry

Regarding information asymmetry indicators, in addition to existing studies that measure information disclosure quality (including financial indicators: surplus management, third-party ratings: the higher the rating of the quality of stock exchange disclosure, and trading volume dependence: KV index, etc.), Song Min et al. (2021) and Yu Wei et al. (2012) propose to utilize the trading information of individual shares of a firm to capture the degree of information asymmetry between uninformed and informed traders about firms' value in a securities market, and use this as a proxy variable for the degree of information asymmetry between capital suppliers and firms. trader's information about firm value, and to use it as a proxy variable for the degree of information asymmetry between capital suppliers and firms. The study shows that in stock trading, informed traders who are close to the firm usually have more information about the firm's business conditions and prospects than other traders, and that uninformed traders, fearing that they will suffer losses due to their informational disadvantages, will ask for premium compensation to compensate for the potential losses that may be caused by the adverse selection problem. The strength of information asymmetry about the value of an asset is an important determinant of asset liquidity; the greater the information asymmetry and the adverse selection problem, the higher the premium and the less liquid the stock.

Based on this, this paper adopts the approach of Song Min et al. (2021) and Yu Wei et al. (2012) to characterize stock market liquidity by calculating the Amihud et al. (1997) liquidity ratio indicator, LR, and the Amihud (2002) illiquidity ratio indicator, ILL, and then the yield inversion indicator, GAM, and then finally conducts a principal component analysis based on these three stock market liquidity indicators. Finally, a principal component analysis is conducted based on these three stock market liquidity indicators to capture their common variance information, i.e., the components related to asymmetric information, which is denoted as information asymmetry indicator Asy. The formula of the indicators involved is as follows:

$$LR_{it} = -\frac{1}{D_{it}} \sum_{k=1}^{D_{it}} \sqrt{\frac{V_{it}(k)}{|r_{it}(k)|}}$$

$$ILL_{it} = \frac{1}{D_{it}} \sum_{k=1}^{D_{it}} \sqrt{\frac{|r_{it}(k)|}{V_{it}(k)}}$$

$GAM = |\gamma_{it}|$  The coefficient  $\gamma_{it}$  it is estimated by the following equation:  $r_{it}^e(k) = \theta_{it} + \varphi_{it}r_{it}(k-1) + \gamma_{it}V_{it}(k-1)sign[r_{it}^e(k-1)] + \varepsilon_{it}(k)$ , where  $r_{it}^e(k) = r_{it}(k) - r_{mt}(k)$  denotes the excess return,  $r_{mt}(k)$  denotes the market return weighted by market capitalization,  $rm$  denotes the market return weighted by market capitalization outstanding,  $r$  denotes the company's individual stock return,  $V$  denotes the daily turnover, and  $D$  denotes the number of trading days in a year.

Through principal component analysis of the original indicators, their common variance information, i.e., components related to asymmetric information, is extracted, which is denoted as the information asymmetry indicator *Asy*, and the larger the value, the higher the information asymmetry.

### 3.2.5. Control Variable

This paper controls for other variables that may affect the quality of firms' accounting information in terms of both the firm's financial position and governance level: firm size (*Size*), capital structure (*Lev*), profitability (*Roa*), nature of property rights (*Soe*), book-to-market ratio (*Bm*), market-to-book ratio (*Pb*), accounts receivable ratio (*Rec*), growth rate of total assets (*Agrowth*), whether it is loss-making (*Loss*), board size (*Board*), and whether the firm is a member of the board of directors. (*Loss*), and Board size (*Board*). In addition, in order to further control for unobservables that do not vary with industry and time, time fixed effects (*Year*) and industry fixed effects (*Ind*) are added to the model, and the specific definitions of the variables are shown in Table 1.

**Table 1.** Definition of variables

	Variables	Symbol	Description
dependent variable	Quality of Accounting Information	<i>Acq</i>	Real Earnings Management
independent Variable	Corporate ESG Performance	<i>Esg</i>	CSI ESG Composite Score
	Financing constraints	<i>Sa</i>	Absolute Value of Sa Index
	Information Asymmetry	<i>Asy</i>	Principal Component Analysis Extraction
	Percentage of Independent Directors	<i>Indep</i>	Number of independent directors / number of all directors
	Capital Structure	<i>Lev</i>	Total liabilities/total assets at the end of the year
	Growth Capability	<i>Growth</i>	(Net profit of the current period - net profit of the previous period)/net profit of the previous period
Mediating variables	Book-to-Market Ratio	<i>Bm</i>	Book Value/Total Market Capitalization
	P/B Ratio	<i>Pb</i>	Price per share/net assets per share
	Accounts Receivable Ratio	<i>Rec</i>	Net accounts receivable at the end of the year/total assets
	Total Assets Growth Rate	<i>Agrowth</i>	(Total assets for the current period - Total assets for the previous period)/Total assets for the previous period
	Loss or not	<i>Loss</i>	Assigned a value of 1 if the net profit for the year is less than 0, and 0 otherwise.
	Board Size	<i>Board</i>	ln(total number of board members)
	Year	<i>Year</i>	Dummy variable
	Industry	<i>Ind</i>	Dummy variable

### 3.3. Model Building

To test hypothesis H1 this paper constructs model (1) as follows:

$$Acq_{i,t} = \theta_0 + \theta_1 Esg_{i,t} + \theta_2 Controls_{i,t} + \sum Year + \sum Ind + \varepsilon_{i,t} \quad (1)$$

*i* denotes firm, *t* denotes year,  $ESG_{i,t}$  denotes the ESG composite score of firm *i* in period *t*,  $Controls_{i,t}$  denotes a series of control variables,  $\varepsilon_{i,t}$  is a random error term, and year effect (*Year*) and industry effect (*Ind*) are fixed in the model.

To test hypotheses H2, H3 this paper constructs model (2) (3) as follows:

$$Sa_{i,t} = \theta_0 + \theta_1 Esg_{i,t} + \theta_2 Controls_{i,t} + \sum Year + \sum Ind + \varepsilon_{i,t} \quad (2)$$

$Sa_{i,t}$  denotes the degree of financing constraints of firm  $i$  in period  $t$ ,  $Controls_{i,t}$  denotes a series of control variables,  $\varepsilon_{i,t}$  is a random error term, and year effect (Year) and industry effect (Ind) are fixed in the model.

$$Asy_{i,t} = \theta_0 + \theta_1 Esg_{i,t} + \theta_2 Controls_{i,t} + \sum Year + \sum Ind + \varepsilon_{i,t} \quad (3)$$

$Asy_{i,t}$  denotes the degree of information asymmetry of firm  $i$  in period  $t$ ,  $Controls_{i,t}$  denotes a series of control variables,  $\varepsilon_{i,t}$  is a random error term, and year effect (Year) and industry effect (Ind) are fixed in the model.

## 4. Empirical Results and Analysis

### 4.1. Descriptive Statistics

Table 2 presents the descriptive statistics of the main variables of this paper. Among them, the mean value of ESG performance of enterprises is 73.7096, the median is 73.8300 the minimum value is 59.1100, the maximum value is 84.9500, and the standard deviation is 5.2287, which indicates that there is a large gap in ESG performance among enterprises. The mean value of corporate accounting information quality is 0.0658, the median is 0.0438, the minimum value is 0.0008, and the maximum value is 0.3939, implying that there is a large difference in the level of accounting information quality among different listed companies. In addition, the standard deviation of the price-to-book ratio is 2.5566, the minimum value is 0.4880, and the maximum value is 14.8062, which means that the price-to-book ratios of the sample firms also have a large difference, and the distributions of the rest of the control variables are within a reasonable range.

**Table 2.** Descriptive statistics results

Variable	Sample	Mean	Median	Standard deviation	Minimum	Maximum
<i>Acq</i>	10,015	0.0658	0.0438	0.0700	0.0008	0.3939
<i>Esg</i>	10,015	73.7096	73.8300	5.2287	59.1100	84.9500
<i>Size</i>	10015	22.5886	22.4113	1.2913	20.2609	26.4116
<i>Indep</i>	10015	37.4625	33.3300	5.6097	18.1800	80.0000
<i>Lev</i>	10,015	0.4194	0.4159	0.1943	0.0506	0.8409
<i>Growth</i>	10,015	0.1887	0.1231	0.3621	-0.4422	2.1575
<i>Bm</i>	10,015	0.6213	0.6111	0.2637	0.1233	1.2037
<i>Pb</i>	10,015	3.2758	2.5298	2.5566	0.4880	14.8062
<i>Rec</i>	10,015	0.1244	0.1060	0.1021	0.0005	0.4726
<i>Agrowth</i>	10,015	0.1882	0.1076	0.3211	-0.2085	2.1430
<i>Loss</i>	10,015	0.0703	0	0.2557	0.0000	1.0000
<i>Board</i>	10,015	2.1379	2.917	0.1942	1.6094	2.7081

### 4.2. Correlation Analysis

In order to test the correlation between the main variables, this paper conducted the Pearson correlation coefficient test between corporate ESG performance and corporate accounting information quality, and the correlation coefficient between corporate ESG performance and

corporate accounting information quality was significantly negative at the 1% level, which preliminarily verified the reasonableness of the hypothesis H1, that is, the corporate ESG performance can promote the improvement of corporate accounting information quality. Secondly, from the size of the correlation coefficients of other variables, there is no high correlation between the variables. In addition, this paper also examines the value of variance inflation factor VIF of each major variable and finds that none of them exceeds 3.79, which is much lower than the critical value of 10, further indicating that the model does not have the problem of multicollinearity.

### 4.3. Regression Analysis

**Table 3.** Regression results

	(1)	(2)	(3)
	<i>Acq</i>	<i>Acq</i>	<i>Acq</i>
<i>Esg</i>	-0.0028*** (-4.1373)	-0.0024*** (-3.6290)	-0.0023*** (-3.4257)
<i>Size</i>		-0.0124*** (-2.6504)	-0.0143*** (-2.9760)
<i>Indep</i>		-0.0002 (-0.2566)	-0.0002 (-0.2909)
<i>Lev</i>		0.1209*** (4.9977)	0.1579*** (6.4177)
<i>Growth</i>		0.0059 (0.5363)	0.0113 (1.0005)
<i>Bm</i>		0.1616*** (6.5304)	0.1980*** (7.6452)
<i>Pb</i>		-0.0012 (-0.4573)	-0.0033 (-1.2140)
<i>Rec</i>		0.2111*** (5.3953)	0.1959*** (4.7380)
<i>Agrowth</i>		0.0321** (2.0287)	0.0224 (1.3991)
<i>Loss</i>		0.0589*** (7.1108)	0.0494*** (5.8373)
<i>Board</i>		-0.0224 (-1.0223)	-0.0184 (-0.8271)
<i>Constant</i>	0.1830*** (3.7263)	-3.6954* (-1.6932)	-10.0550*** (-4.0433)
Year	No	No	Yes
Industry	No	No	Yes
Sample	10,015	10,015	10,015
Adj R-squared	0.005	0.078	0.097

This paper first tests the relationship between corporate ESG performance and accounting information quality according to model (1), and the regression results are shown in Table 3. In column (1), no other control variables are added to the regression in order to test the direct impact of corporate ESG performance on the quality of accounting information, and the results show that the regression coefficient of corporate ESG performance is -0.0028, and it is significant at the 1% level. In column (2), a series of control variables are added and the regression coefficient of firms' ESG performance is -0.0024, which is still significant at the 1% level. Further controlling for year and industry fixed effects in column (3), the significance is the same as in column (2). The above results indicate that corporate ESG performance at this stage can significantly contribute to the improvement of corporate accounting information quality, and hypothesis H1 is verified.

#### **4.4. Robustness Test**

##### **4.4.1. Replacement of the Dependent Variable**

In order to test the robustness of the results, this paper uses the modified Jones model of accrued surplus management instead of the real surplus management regression, the test results are shown in column (4) of Table 4, the regression coefficients of the variable Esg are -0.0003, respectively, which is significantly negative at the 5% level, and the findings of this paper remain unchanged.

##### **4.4.2. Replacement of Independent Variables**

In order to test the robustness of the results, this paper uses the assignment of CSI ESG ratings instead of ESG composite score regression, the test results are shown in column (3) of Table 4, the regression coefficients of the variable Esg are -0.0100, respectively, which is significantly negative at the 1% level, and the findings of this paper remain unchanged.

##### **4.4.3. Narrowing the Sample Interval**

This paper narrows the study interval to 2017-2021 and the results are shown in column (5) of Table 4, where the regression coefficient of the variable Esg is significantly negative at the 1% level, and the findings of this paper remain unchanged.

##### **4.4.4. Independent Variable Lagged One Period**

As the impact of corporate ESG performance on the quality of accounting information may be lagged and two-way causality, because this paper will be the core explanatory variable Esg lagged one period to re-regression, the test results are shown in column (2) of Table 4, the regression coefficient of the variable Esg is significantly negative at the 1% level, the conclusions of this paper remain unchanged.

##### **4.4.5. Instrumental Variable**

Considering that there may be endogeneity problems such as omitted variables between firms' ESG performance and accounting information quality, this paper thus draws on the practice of Yi Xiuqin et al. (2023) to use the mean of ESG performance of other listed firms in the same region at the same time and in the same region, except for the Company, as the instrumental variable in the two-stage regression. The ESG performance of other listed companies in the same region and time will have an impact on the ESG performance of a listed company, but it will not directly affect the quality of the firm's accounting information, so the instrumental variable satisfies the correlation condition. In the first stage regression, the estimated coefficients of instrumental variables are significant at 1% level, which indicates that the instrumental variables have good explanatory power for the endogenous variables, and the F-statistic value of Wald test is 41.893, which passes the weak instrumental variables test. The regression results of instrumental variables test are shown in column (6) of Table 4. In the second stage regression, the coefficient of the fitted value of the variable Esg is significantly negative at the 1% level, which is consistent with the main regression results, indicating that the findings of this paper are relatively robust.

**Table 4.** Robustness test results

	(1)	(2)	(3)	(4)	(5)	(6)
	<i>Acq</i>	<i>Acq</i>	<i>Acq</i>	<i>Acq</i>	<i>Acq</i>	<i>Acq</i>
<i>Esg</i>	-0.0007 (-1.3734)			-0.0003** (-2.0034)	-0.0016*** (-3.3253)	-0.0195*** (-2.8325)
<i>Esg_1</i>		-0.0023*** (-4.8575)				
<i>Value</i>			-0.0100*** (-3.2821)			
<i>Constant</i>	-9.8846*** (-4.2045)	-4.7162* (-1.8043)	-10.2714*** (-4.1320)	1.9085*** (2.5765)	-1.1025 (-0.2574)	-0.2032 (-0.0955)
Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Sample	10,015	7624	10,015	10015	5386	10014
Adj R-squared	-0.190	0.105	0.097	0.167	0.123	0.1488

## 5. Further Analysis

### 5.1. Mechanism Analysis

For hypotheses H2, H3, this paper takes real surplus management as the explanatory variable, financing constraints and information asymmetry as the mediator variables respectively, and corporate ESG performance as the explanatory variable, and carries out the mediation effect test in accordance with the model (2) (3) respectively, and the regression results are shown in Table 5, the ESG regression coefficients of financing constraints and information asymmetry are respectively are -0.0024 and -0.0011, which are all significant at 1%, indicating that the improvement of corporate ESG performance can significantly alleviate corporate financing constraints, reduce information asymmetry. Existing studies show that financing constraints and information asymmetry have a significant negative effect on corporate true surplus management (Cheng Qian et al. 2023, Luo Jinhui and Wu Yilong, 2021, Zhang Yinghui et al. 2021). In summary, corporate ESG performance improves corporate accounting information quality through two paths: alleviating financing constraints and reducing information asymmetry, and research hypotheses H2 and H3 are all verified.

### 5.2. Heterogeneity Analysis

#### 5.2.1. Property

In terms of the motivation for fulfilling ESG responsibilities, state-owned enterprises, due to their stronger affiliation with the government, lower marginal cost of obtaining support from the government and financial institutions, and more convenient access to relevant resources, fulfill their ESG responsibilities basically out of responding to the government's call, while non-state-owned enterprises, as market participants driven by economic interests, actively fulfill their ESG responsibilities to meet the needs of stakeholders such as the government, financial institutions, the public, etc., thus obtaining the benefits of their support and having a more improving effect on the quality of accounting information. and thus obtain the benefits of their support, which has a stronger effect on improving the quality of accounting information. In terms of the process of fulfilling ESG responsibilities, SOEs are subject to strict control by the government, and at the same time undertake non-economic objectives such as economic objectives and social responsibilities (Pan Jun et al. 2020; Qiao Pengcheng and Xu Xiangbing 2021; Wang Xianbin and Huang Liangxiong 2021), and are

subject to stricter market supervision and stronger demonstration effects, so in terms of actual organizational management and production and operation, the ESG practices of SOEs need to comprehensively consider the policy, social repercussions and other factors, compared with non-state-owned enterprises are subject to more restrictions, resulting in a weaker role in improving the quality of accounting information. Therefore, this paper speculates that the ESG performance of non-state-owned enterprises has a greater impact on the quality of accounting information, and assigns the value of 1 to state-owned enterprises and 0 to non-state-owned enterprises for testing. As shown in column (1)(2) of Table 6, the regression coefficient of Esg for state-owned enterprises is -0.0006, while the regression coefficient of Esg for non-state-owned enterprises is -0.0035, which is significantly negative at the 1% level, consistent with the speculation.

**Table 5.** Mechanism test results

	(1)	(2)
	<i>Sa</i>	<i>Asy</i>
<i>Esg</i>	-0.0024*** (-5.1181)	-0.0011*** (-2.6482)
<i>Size</i>	-0.0763*** (-25.5432)	0.1108*** (40.9183)
<i>Indep</i>	-0.0005 (-1.0173)	-0.0003 (-0.7536)
<i>Lev</i>	0.2193*** (13.0622)	0.0384** (2.5212)
<i>Growth</i>	-0.0291*** (-3.7362)	-0.0178** (-2.5214)
<i>Bm</i>	-0.0554*** (-3.1785)	-0.2745*** (-17.3820)
<i>Pb</i>	-0.0117*** (-7.5053)	0.0006 (0.3991)
<i>Rec</i>	-0.1710*** (-6.9602)	-0.2824*** (-12.6706)
<i>Agrowth</i>	0.0368*** (4.1870)	0.0231*** (2.9013)
<i>Loss</i>	-0.0318*** (-3.4251)	-0.0432*** (-5.1230)
<i>Board</i>	0.0889*** (6.0580)	0.1133*** (8.5154)
<i>Constant</i>	-95.1092*** (-36.2813)	35.5193*** (14.9400)
Year	Yes	Yes
Industry	Yes	Yes
Sample	10,015	10,015
Adj R-squared	0.2514	0.3198

### 5.2.2. Region

Different regions have different levels of economic development and different degrees and speeds of economic response to corresponding policies. The eastern region has better overall economic development, better corresponding policies, and a more mature financial regulatory system than that of the central and western regions, which can provide policy support for enterprises actively fulfilling their ESG responsibilities, and thus improve the quality of their accounting information. Therefore, this paper hypothesizes that the ESG performance of enterprises in the eastern region has a more obvious effect on the quality of accounting information than that in the central and western regions. According to the division of the three major economic zones in China, the sample firms are divided into the eastern region and the central and western region for testing. As shown in columns (3) and (4) of Table 6, the regression coefficient of Esg in the eastern region is -0.0027, which is significantly negative at the 1% level, while the regression coefficient of Esg in the central and western regions is -0.0015, which indicates that ESG performance of firms in the eastern region has a more significant effect on the improvement of the quality of accounting information than that of the central and western regions.

### 5.2.3. Competition Intensity

The degree of market competition affects the ESG performance of enterprises mainly by influencing the allocation of market resources, thus affecting the quality of their accounting information. The stronger the competition in the industry, the more companies need to consider the competitors' reaction, market reaction and other factors to fulfill their ESG responsibilities, and their positive degree of ESG performance is limited, while companies with weak competitive intensity are more likely to improve their market competitiveness by actively fulfilling their ESG responsibilities due to their weaknesses in other aspects, which has a stronger effect on the improvement of accounting information quality. Therefore, this paper hypothesizes that firms with weak competitive intensity have a more significant effect on the improvement of accounting information quality. In order to measure the degree of market competition, this paper draws on the practice of Wang Yanchao et al. (2020) to construct the industry lerner index (lerner), which is calculated by the formula of (operating revenue - operating costs - selling expenses - administrative expenses) / operating revenue. The smaller the index, the greater the intensity of competition faced by the firm. In this paper, the median of the sample data to distinguish between high market competition and low market competition degree group for regression, regression results as shown in Table 6 columns (5) (6), the regression coefficient of Esg of enterprises with weak competitive intensity is -0.0037, which is significantly negative at the level of 1%, while the regression coefficient of Esg of enterprises with strong competitive intensity is -0.0010, and the results indicate that enterprises with weak competitive intensity whose ESG performance has a more significant effect on the improvement of accounting information quality.

**Table 6.** Results of heterogeneity analysis

	Property		Region		Competition intensity	
	(1) State-owned	(2) Non state-owned	(3) Eastern	(4) Midwestern	(5) Weak	(6) Strong
<i>Esg</i>	-0.0006 (-0.9379)	-0.0035*** (-6.6565)	-0.0027*** (-5.4701)	-0.0015* (-1.9434)	-0.0037*** (-6.0875)	-0.0010* (-1.8450)
<i>Constant</i>	-15.4080*** (-4.5087)	-9.7540*** (-3.1736)	-12.3688*** (-4.4987)	-6.5406 (-1.5702)	-10.0567*** (-2.8968)	-11.1613*** (-3.6428)
Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Sample	3509	6506	7125	2890	4809	5206
Adj R-squared	0.091	0.114	0.100	0.113	0.109	0.098

## 6. Conclusion and Implications

This paper explores the impact of corporate ESG performance on accounting information quality and its mechanism of action by using the panel data of 10015 listed companies from 2012 to 2021, and the research samples are grouped according to ownership attributes, regions, competitive intensity, whether they are polluting enterprises, and the degree of marketization to conduct heterogeneity analysis. The study finds that (1) corporate ESG performance has a significant positive effect on accounting information quality, i.e., the better the corporate ESG performance, the lower the level of corporate real surplus management and the higher the quality of accounting information. (2) Mechanism analysis shows that corporate ESG performance improves accounting information quality by reducing financing constraints and reducing information asymmetry. (3) Heterogeneity analysis finds that there is heterogeneity in various aspects such as property rights in the promotion of corporate ESG performance on accounting information quality, i.e., it is more significant in non-state-owned enterprises, non-polluting industry enterprises, enterprises in the eastern region.

Based on the above findings, this paper puts forward the following policy recommendations: First, enterprises should strengthen the awareness of fulfilling ESG responsibilities, fully incorporate the enhancement of ESG performance into the cultural construction and mechanism design as an important strategy for realizing the long-term value and sustainable development of the enterprise, and implement it into every aspect of operation and management, product development, employee cultivation, customer service, and public welfare; at the same time, they should incorporate ESG concepts into the rating system and take the initiative to strengthen the disclosure of ESG information to build up the reputation and image of the company through analysts and other channels. At the same time, ESG concepts have been integrated into the rating system and ESG information disclosure has been strengthened proactively to establish a good reputation and image of the company through the signaling function of analysts and other channels. Considering that non-state-owned enterprises, non-polluting industries, eastern regions, weaker competition, and enterprises with a higher degree of marketization have a more obvious role to play in improving the quality of accounting information, this type of enterprises should pay more attention to the construction of ESG, in order to strive for the key resources from investors, consumers, the government, and other stakeholders. Secondly, improve ESG-related legislation, increase the cost of poor ESG performance and false performance of enterprises, and promulgate relatively uniform and complete ESG disclosure guidelines for listed companies to guide and strengthen ESG disclosure of listed companies, at present, China's listed companies' ESG disclosure system is not sound, and the disclosure of information is still in a semivoluntary state, and it is necessary to enhance the disclosure of listed companies to improve the The quality of information disclosure of listed companies should be improved to provide protection for stakeholders, thus promoting the steady operation of the capital market. At the same time, institutional investors should be appropriately guided to pay attention to the research report on ESG performance of enterprises and deepen other investors' knowledge of ESG, so as to guide the benign development of enterprises and improve the quality of their accounting information. Third, investors should pay attention to the signals conveyed by ESG-related information, and on the basis of the macro environment and corporate financial information, they should additionally introduce non-financial information such as corporate environmental responsibility, social responsibility, corporate governance, etc., so as to integrate ESG into the strategic objectives of investment, research and analysis, portfolio management, risk control, due diligence management, etc., so as to reduce the risk of investment and obtain sustainable returns in the long term.

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