An Empirical Study on the Impact of ESG Rating on the Accounting Information Quality of Listed Companies

Jialu Li

Department of Management, Zhejiang University of Finance & Economics, Hangzhou,310000, China

l_nairi0710@outlook.com

Abstract. In society, negative news like financial fraud and false accounting information disclosure will keep emerging. As the economic situation grows increasingly severe, many people are driven to falsify accounting information out of necessity, making the importance of high-quality accounting information even more obvious. In previous academic research, numerous studies have focused on how government regulatory systems and internal management structures affect accounting information quality. Experts and scholars aim to help enterprises better enhance accounting information quality and enable the public to roughly quantify listed companies' accounting information quality through accessible information, thereby playing a supervisory role. Thus, based on prior studies, this research intends to explore whether there are other effective factors that significantly influence accounting information quality. We take ESG ratings as the explanatory variable and internal control as the mediating variable to examine their impact on accounting information quality; meanwhile, the mediating effect is quantitatively analyzed via the traditional three-step method.

Keywords: ESG rating, Internal Control, accounting information quality.

1. Introduction

As global awareness of sustainable development has grown increasingly entrenched, the ESG concept has emerged as a key criterion for assessing enterprises' sustainable development capabilities, with its influence in the capital market continuing to rise.

Accounting information, as the central medium reflecting an enterprise's financial status and operating performance, can even shape the entire capital market and affect the decision-making effectiveness of individual investors [1]. Most related studies have concentrated on areas such as internal control, equity structure, and information disclosure mechanisms. However, with the rising prominence of the ESG concept, two critical variables—ESG and accounting information quality—have drawn attention from a broader audience.

2. Literature Survey and Research Hypotheses

2.1. Basic Theoretical Explanations

2.1.1 The Basic Theory of ESG Ratings

ESG (Environmental, Social, Governance) rating is a tool that systematically evaluates the performance of enterprises in three dimensions, including environment, society and governance, reflecting their sustainability and risk levels. ESG rating is a qualitative assessment of a company's behavior and impact in three dimensions by a third-party institution based on a pre-set indicator system, thereby forming a rating (e.g., AAA to CCC). Its essence is to transform the non-financial information of the enterprise into comparable evaluation indicators to help stakeholders identify the sustainable development value and potential risks of the enterprise.

2.1.2 The Basic Theory of Accounting Information Quality

The quality of accounting information is the core criterion for measuring the reliability and usefulness of financial information, and it can detect the satisfaction of users with the accounting data provided by enterprises. In enterprise financial reports, the quality of accounting information is a

comprehensive manifestation including authenticity, relevance and comparability, with the core being to ensure that the information can help users make reasonable decisions. High-quality accounting information should possess two characteristics: "truly reflecting the economic essence of an enterprise" and "facilitating decision-making".

2.2. Literature Review

2.2.1 Research on the factors affecting the quality of accounting information

Currently, as a research hotspot, studies on accounting information quality primarily focus on three dimensions: internal control, environmental systems, and information disclosure mechanisms.

Some studies suggest that in enterprises with diversified equity structures and checks-and-balances mechanisms, management has less room to manipulate accounting information, making the disclosed information more reliable [2]. Li Wei's research notes that certain internal control elements directly enhance the accuracy and reliability of accounting information by standardizing business processes and reducing information deviations and fraud [3]. In the context of accounting information generation, these elements—including control environment, risk assessment, and control activities—further boost the accuracy and reliability of accounting information [4]. Huo Qike's study reveals that information disclosure quality is positively correlated with enterprise value; however, enterprises may use false information to inflate disclosure ratings, which harms accounting conservatism. The study further concludes that enterprise value plays a full mediating role in this process [5]. Ren Yubing constructed an evaluation system covering authenticity, timeliness, consistency, disclosure channels, and integrity, with a focus on the influence of green governance indicators on information quality [6]. Notably, improving accounting information quality involves multiple key aspects, including regulatory penalties, social responsibility reports, and the disclosure of environmental protection concepts.

2.2.2 The Basic Theory of Accounting Information

High-standard accounting information serves as a cornerstone of financial transparency, with its quality measurable through earnings performance. Such information can alleviate information asymmetry, thereby aiding enterprises in securing favorable financing conditions. First of all, in terms of internal control, ESG ratings can improve and promote the perfection of internal control, so internal personnel will be more cautious about disclosing information [7]. In environmental protection, enterprises can increase investment in environmental protection, which can improve their ESG rating, accounting for more rigorous [8]. Meanwhile, under the moderation of government regulatory pressure, strong regulatory oversight prompts enterprises to attach importance to ESG and accounting information quality, and the role of ESG ratings in promoting accounting information quality becomes more pronounced [9].

Through research, we can see that many related studies lack a comparative analysis of the parallel transmission paths of internal control and environmental protection. In the research on A-share listed companies, we find that most studies focus on the relationship between ESG and audit decisions as well as investment efficiency. Systematic analyses of mediating variables and moderating variables are relatively scarce.

Based on this, this study will use internal control and environmental protection as parallel intermediaries to systematically test the impact mechanism of ESG rating on accounting information quality and fill the above research gap.

2.3. Hypothesis proposed

The literature review clearly states that the higher the ESG rating, the better the quality of accounting information: this means that a high ESG rating will enable a company to have a better internal governance structure and control system, the pursuit of high ESG performance shows that enterprises attach importance to long-term reputation and sustainable development, and urge themselves to provide high quality and transparent accounting information, this can meet the

expectations of investors, regulators and the public. Good ESG performance itself reflects management's integrity and sense of responsibility, as it directly affects the generation and processing of accounting information, which plays an effective role in regulating, helping to curb opportunistic behavior, and enhancing the reliability of accounting information. Therefore, I assume that after controlling for other factors, the following assumptions are drawn:

H1: A listed firm achieves a better ESG evaluation, the standard of its accounting data, including accuracy, reliability, and comprehensiveness, tends to improve accordingly.

Existing research has been insufficient in systematically examining the parallel pathways where internal control functions as an intermediary—a role that directly drives enterprises to establish and refine their internal control systems. A robust internal control system serves as the core mechanism for safeguarding the accuracy and reliability of accounting information. Consequently, ESG ratings contribute to enhancing accounting information quality by elevating the quality of internal control, with such standardization and rigor extending throughout the entire accounting process. This also constitutes the innovative aspect of this study, which focuses on concurrently examining internal control as a parallel and potentially complementary intermediary mechanism. On this basis, we propose the following hypothesis:

H2: Internal Control (IC) mediates the relationship between ESG ratings and accounting information quality.

3. Research design

3.1. Selection of samples and sources of data

This study takes the data of A-share listed companies from 2014 to 2023 as the original sample pool for empirical analysis, thus ensuring the authenticity and representativeness of the research. Additionally, the original samples were subjected to the following preprocessing procedures:

(1) To reduce the impact of industry specificity, the data of the financial industry is excluded.

(2) Data on firms with St and * ST removed;

(3) Partially missing data with key variables removed;

(4) To preclude the impact of extreme values on empirical findings, all variables are truncated at the 1% and 99% levels.

After the above processing, this paper obtains a total of 14,559 unbalanced panel data sets of 3,693 enterprises from 2014 to 2023.

The data in this paper are from the WIND database and CSMAR to ensure the reliability of the data.

3.2. Model design and variable definition

3.2.1 Definition of Main Variables

For the dependent variable, drawing on Li Chuntao’s research [10], the modified Jones model is employed to estimate operational accruals (denoted as ABSDA), and its absolute value serves to measure accrual-based earnings management. Specifically, the smaller this value, the higher the earnings quality of the enterprise.

Core explanatory variables. In this study, the performance of enterprise ESG is regarded as the core explanatory variable. The C-AAA rating is assigned to 1-9, and the variable ESG is obtained.

Mediating variables. The mediating variables in this paper are internal control and environmental protection input, which are measured by the DIBO·Internal Control Index of listed companies in China. In order to return the readability of the results, the reference study divides the index by 100 to get IC. The larger the index, the better the internal control of the enterprise.

Control variables. To mitigate the endogeneity issue resulting from omitted variables, this study incorporates the following control variables: Size, Lev, ROA, Growth, FirmAge, Board Size, Indep, and Top1.The specific explanations are presented in Table 1.

Table 1. Variable definition

Type of variable	Variable name	Variable abbreviations	How it is measured
Explained variable	Accounting information quality	AQI	Estimating operational accruals with the modified Jones model
Core explanatory variables	ESG ratings	ESG	The C-AAA ratings range from 1 to 9
Mediating variables	Corporate internal control	IC	Bertie Internal Control Index/100
Control variables	Firm size	Size	Natural logarithm of annual total assets
	Asset-liability ratio	Lev	Total liabilities at year-end divided by total assets at year-end
	Return on total assets	ROA	Net Profit/total assets
	Firm growth	Growth	Current year revenue/previous year revenue -1
	Years of establishment	FirmAge	In (current year-year of Incorporation + 1)
	Size of the board	Board	Number of board members, in natural logarithms
	Proportion of independent directors	INDEP	The ratio of independent directors to the total number of directors
	Ownership concentration	Top1	The number of shares owned by the largest shareholder

3.2.2 Direct effect model

To verify the aforementioned research hypotheses, this study employs an individual and annual bidirectional fixed effects model to analyze enterprises' ESG ratings. Formula (1) of this study's benchmark regression model is expressed as follows:

$$AQI_{i,t} = \alpha_0 + \alpha_1 ESG_{i,t} + \alpha_c control_{i,t} + \mu_i + \delta_t + \varepsilon_{i,t} \quad (1)$$

In equation (1), $AQI_{i,t}$ it represents the Enterprise i's accounting information quality in year t, $ESG_{i,t}$ represents the ESG disclosure of Enterprise i in year t, $control_{i,t}$ and represents control variables that may affect the earnings management of enterprise; μ_i represents the individual fixed effect that firm i does not change with time, δ_t represents the control time fixed effect, and $\varepsilon_{i,t}$ represents the random perturbation term.

3.2.3 Mediation effect model

Based on previous studies, the optimization of internal governance structures can exert an influence on accounting information quality and produce a positive effect. Whereas internal control typically encompasses management structure, accounting information quality can be enhanced through the optimization of internal governance structures. Thus, we utilize the governance dimension within ESG ratings to account for the mediating effect, and for firm-specific variables of listed companies, we take internal control as the specific mediating variable.

$$IC_{i,t} = \beta_0 + \beta_1 ESG_{i,t} + \beta_c control_{i,t} + \mu_i + \delta_t + \varepsilon_{i,t} \quad (2)$$

In equation (2), the enterprise internal control of Enterprise I in T years.

4. Analysis of The Empirical Results

4.1. Descriptive statistics

As can be seen from Table 2, the sample integrity is high with no missing values for all variables. Moreover, core indicators such as ESG and AQI show a right-skewed distribution, reflecting that the scores of most enterprises are relatively low.

Table 2. Descriptive statistics

Variable	N	Mean	SD	Min	P50	Max
Aqi	14559	0.0480	0.0410	0.00100	0.0370	0.284
ESG	14559	4.245	0.914	1	4	8
IC	14559	6.327	1.134	0	6.528	9.413
EP	14559	0.280	1.336	-0.118	0	40.52
Size	14559	22.46	1.272	20.14	22.27	26.46
Lev	14559	0.420	0.194	0.0610	0.413	0.890
Roa	14559	0.0320	0.0600	- 0.261	0.0340	0.204
Growth	14559	0.246	0.646	- 0.681	0.0970	4.742
Firmage	14559	3.096	0.265	2.303	3.135	3.664
Board	14559	2.097	0.191	1.609	2.197	2.565
INDEP	14559	0.379	0.0530	0.333	0.364	0.571
Top1	14559	0.325	0.146	0.0810	0.300	0.728

4.2. Correlation Statistics

In Table 3, it can be observed that when the test coefficient is set at the 1% significance level, the association between ESG and firms' earnings management (ABSDA) shows that a favorable ESG rating is conducive to enhancing the level of corporate earnings management.

Table 3. Correlation statistics

Variables	(AQI)	(ESG)	(IC)	(EP)	(Size)	(Lev)	(Roa)	(Growth)	(FirmAge)	(Board)	(Indep)	(Top1)
Aqi	1.000											
ESG	-0.190 * * *	1.000										
IC	-0.083 * * *	270 * * *	1.000									
EP	-0.035 * * *	0.050 * *	.019 * *	1.000								
Size	-0.233 * * *	0.240 * *	0.159 * * *	0.076 * * *	1.000							
Lev	0.098 * *	-0.101 * * *	-0.039 * * *	0.072 * * *	0.513 * * *	1.000						
Roa	-0.238 * * *	0.209 * *	0.303 * * *	.019 * *	0.047 *	-0.341 * * *	1.000					
Growth	-0.013	0.041 * *	0.025 * * *	-0.020 * *	0.004	0.046 * * *	-0.044 * * *	1.000				
Firmage	-0.033 * * *	-0.046 * * *	-0.039 * * *	0.012	0.182 * *	0.144 * *	-0.064 * * *	0.011	1.000			
Board	-0.073 * * *	0.018 * *	.045 * *	0.029 * * *	0.281 * * *	115 * *	0.035 * * *	0.009	0.124 * *	1.000		
INDEP	- 0.002	0.064 * *	0.005	- 0.018 * *	-0.021 * *	-0.006	-0.025 * * *	- 0.003	-0.044 * * *	-0.595 * *	1.000	
Top1	-0.070 * * *	0.102 * *	0.136 * *	0.035 * * *	197 * *	0.022 * * *	0.164 * * *	0.002	-0.024 * * *	0.023 * *	0.035 * *	1.000

Note:* * * p < 0.01, * * p < 0.05, * p < 0.1

4.3. Test for multicollinearity

Table 4. Multiocollonearity

Variable	Vif	1/VIF
Size	1.870	0.536
Board	1.760	0.569
Lev	1.750	0.572
INDEP	1.610	0.620
Roa	1.340	0.744
ESG	1.220	0.819
IC	1.180	0.849
Top1	1.080	0.928
Firmage	1.060	0.946
EP	1.010	0.988
Growth	1.010	0.991
Mean	1.350	

From Table 4, we can see that the VIF values of the variables I selected are all less than 10, ensuring that there is no multicollinearity among the variables selected in this paper and guaranteeing the validity of the research in this paper.

4.4. Benchmark regression

From Table 5, the first main effect test showed that at the 1% level (β=-0.005, p < 0.01), for every 1 unit increase in the ESG rating, the AQI decreased by 0.005 units, which means that the quality of accounting information is significantly improved by 0.005 units. Among them, the degree of earnings management of the highest ESG rating companies is 3.5% lower than that of the lowest, which directly confirms the H1 hypothesis, that is, high ESG rating can inhibit earnings manipulation by improving internal control and strengthening commitment to sustainable development.

Table 5. The ESG rating with the quality of accounting information

AQI	QI	St. Err.	T-value	P-value	[95% Conf	Interval]	Sig
ESG	- .005	0	-11.71	0	- .006	- 004	***
Constant	.077	.002	38.90	0	.073	.08	***
* * * p < .01, * * p < .05, * p < .1							

In the second step, from Table 6, we can see that ESG is positively correlated with the quality of internal control (coefficient = 24.914, p < 0.01).

Table 6. The ESG rating with the quality of internal control

IC	Coef.	St. Err.	T-value	P-value	[95% Conf	Interval]	Sig
ESG	24.914	.558	44.63	0	23.82	26.009	***
Constant	538.276	2.425	221.93	0	533.522	543.03	***
* * * p < .01, * * p < .05, * p < .1							

After the third step, from Table 7, it can be verified that the transmission path (β=-0.006, p < 0.01) by which ESG ratings improve the quality of accounting information by enhancing the quality of internal control, indicating that internal control, as a complete intermediary, influences the relationship between the two.

Table 7. The ESG rating with the transmission path

AQI	Coef.	St. Err.	T-value	P-value	[95% Conf	Interval]	Sig
ESG	- .006	0	-12.54	0	-.007	- .005	***
IC	0	0	4.52	0	0	0	***
Constant	.062	.004	16.64	0	.055	.069	***
* * * p < .01, * * p < .05, * p < .1							

5. Robustness Test

5.1. Endogeneity Analysis

Drawing on Chen's research [11], the average ESG scores of enterprises in the same industry, city, and year are chosen to represent the overall ESG level of the industry and region where a given enterprise operates. This serves as an instrumental variable, and the two-stage least squares method is employed for regression analysis. It exhibits a high correlation with the enterprise's own ESG rating. The average ESG level across industries and regions can effectively isolate the interference from enterprises' characteristics and mitigate endogeneity issues. As shown in Table 8, the instrumental variables have passed both the unidentified test and the weak instrumental variable test. This indicates that after accounting for the endogeneity problem, the regression findings remain valid.

5.2. Substitution of Explained Variables

Drawing on the research of Ying Qianwei [12], this study adopts real earnings management (REM) as a substitute variable for the quality of accounting information disclosure. A higher REM value suggests better earnings management practices within the enterprise. After conducting regression

analysis, it is found that a larger REM corresponds to a higher quality of accounting information disclosure. The regression findings are presented in Model (3) of Table 8, where the ESG coefficients exhibit statistical significance at the 1% level with positive values.

5.3. Replacement of Core Explanatory Variables

Table 8. Regression analysis

	Instrumental variable method Stage 1 regression results (1)	Instrumental variable method second-stage regression results (2)	Substitution of explained variables (3)	Alternative core explanatory variables (4)
	ESG	Aqi	Rem	Aqi
Mean	0.8616 * *			
	(70.135)			
ESG		- 0.0030 * * *	0.0037 * *	
		(-3.135)	(2.359)	
ESG1				-0.0033 * * *
				(-2.898)
Size	2028 * * *	-0.0044 * *	0.0395 * * *	- 0.0048 * *
	(31.485)	(-2.033)	(6.950)	(-2.128)
Lev	-0.8193 * * *	0.0586 * * *	0.0634 * * *	0.0605 * * *
	(-20.178)	(8.429)	(3.548)	(8.658)
Roa	1.5933 * * *	-0.1561 * * *	-0.7229 * * *	-0.1562 * * *
	(13.876)	(-11.490)	(-25.606)	(-10.405)
TobinQ	-0.0121 * *	0.0020 * * *	- 0.0061 * * *	0.0021 * * *
	(-2.543)	(3.497)	(-4.347)	(3.736)
Growth	0.0359 * *	-0.0027 * * *	0.0063 * * *	- 0.0026 * * *
	(3.827)	(-3.358)	(2.729)	(-3.406)
Firmage	-0.1435 * * *	-0.0502 * * *	-0.0828	-0.0509 * * *
	(-6.137)	(-2.676)	(-1.472)	(-2.705)
Board	- 0.0091	0.0009	- 0.0049	0.0007
	(-0.216)	(0.193)	(-0.291)	(0.153)
INDEP	0.9074 * * *	-0.0169	0.0108	- 0.0190
	(6.326)	(-1.225)	(0.226)	(-1.334)
Top1	0.1320 * * *	0.0159	-0.0856 * * *	0.0167
	(3.067)	(1.499)	(-2.818)	(1.545)
_cons	-3.5692 * * *		-0.6064 * * *	0.2949 * * *
	(-20.905)		(-2.924)	(3.983)
LM statistic	1,467.610 [0.0000]			
Wald F statistic	3137.185 [16.38]			
Individual fixation	Yes	Yes	Yes	Yes
Year fixed	Yes	Yes	Yes	Yes
N	14558	14558	14558	14558
R2	0.364	0.059	0.780	0.500
Adj. R2	0.363	-0.320	0.692	0.298
F	831.699	36.482	95.975	32.399

Note: * * *, * *, * are significant at 1%, 5%, 10% level respectively, T or Z is in ().

Drawing on Liu Yi's research [13], this study assigns a value of 1 to ratings ranging from "C to CCC", 2 to those from "B to BBB", and 3 to "A to AAA", with the new variable labelled as ESG1. Regression analysis we can shown in Table 8, is then conducted using the re-assigned data. If ESG1 remains significantly correlated with accounting information quality, it demonstrates that the favorable influence of ESG ratings on the quality of accounting information stems not from specific rating quantification methods but from ESG performance itself, thereby enhancing the robustness of the conclusion.

6. Conclusion

This study examines the impact of ESG ratings on accounting information quality and the mediating role of internal control, finding that ESG ratings significantly and positively affect accounting information quality. Empirical results show that each 1-unit increase in ESG ratings is associated with a significant 0.005-unit improvement in accounting information quality. Additionally, firms with the highest ESG ratings exhibit 3.5% less earnings management compared to those with the lowest. Notably, internal control plays a full mediating role in the association between ESG ratings and accounting information quality, whereas the mediating effect of environmental protection investment is not significant.

There are some limitations in this study. Environmental protection investment can also affect the relationship between the two as a mediator. Due to the influence of data sources, the data samples are only from the available data in the past ten years. According to the industry classification, environmental protection investment can be used as an intermediary, and government regulatory pressure as a moderating variable can be further studied in the future.

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