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Economic Consequences of Environmental, Social, and Governance Performance on Audit Quality in China

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ABSTRACT

This study examines the economic consequences of firms' environmental, social, and governance (ESG) performance for audit quality in China's emerging capital market. Using fixed-effects panel regressions, mediation analysis, and a series of robustness, endogeneity, and heterogeneity tests, the study identifies the underlying economic mechanisms. The empirical results show a positive correlation between audit quality and a firm's ESG performance: higher audit quality is associated with better ESG performance. The mechanism analysis indicates that operational risk and information risk act as mediators in this relationship. Strong ESG performance can reduce both operational and information risks for firms, providing auditors with a more stable economic environment and a clearer information basis, thereby improving audit quality. Heterogeneity analysis further reveals that the positive impact of ESG performance on audit quality is more pronounced in eastern regions and in high-tech and non-heavily polluting sectors. Overall, this study highlights the economic aspects of the ESG–audit nexus and suggests that strengthening ESG practices can improve audit quality and promote a more transparent, efficient, and sustainable environment in emerging markets.

1. Introduction

Corporate ESG (Environment, Social, and Governance) performance has gradually transcended the traditionally emphasized realm of CSR (Corporate Social Responsibility) to become a comprehensive indicator of a firm's long-term value and risk, in line with growing global awareness of sustainable development. As investors, regulators, and the public demand more ESG information, firms are incorporating ESG principles into their daily operations and strategic planning. Furthermore, ESG practices are increasingly recognized as influencing auditing, as they help mitigate a firm's operational risks and information asymmetry [1].

Friede *et al.,* [2] utilized over 2,000 cases from mature European and American markets and found that firms with high ESG performance typically have sound governance structures, internal control

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measures, and robust risk response processes, all of which positively impact financial performance and audit quality. Based on data from Italian firms, Landi and Sciarelli [3] found strong evidence of a substantial association between financial performance and ESG performance. While Zahid *et al.,* [4], based on data from Western European markets, reported that ESG activities increase corporate costs and may negatively affect financial performance. In emerging economies, based on data from Egyptian companies, Diab and Eissa [5] observed that organizations with higher ESG performance are more likely to receive unqualified audit opinions and require higher audit quality to enhance the credibility of financial reporting.

The Chinese A-share market offers a particularly suitable setting for analyzing the relationship between ESG performance and audit quality. First, emerging countries have implemented ESG policies relatively late. As the largest developing country, China can serve as a valuable sample for enriching ESG theoretical research in emerging countries. Second, given China's diversified ownership structure, unbalanced regional development, and differences in industry regulation, it provides a basis for investigating the diverse aspects of the relationship. However, research on corporate ESG performance in China remains limited. The primary motivation of this study is both theoretical and practical. From a theoretical perspective, existing research has extensively examined the economic consequences of ESG performance, including the idea that strong ESG performance can elevate stock returns [6], improve financial performance, and reduce the cost of debt financing [7]. However, there is currently a dearth of research on how ESG performance affects audit quality, despite auditors being significant observers and users of ESG data. From a practical perspective, regulators in China are actively promoting ESG disclosure to support high-quality economic development. Exploring whether stronger ESG performance leads to higher audit quality has direct implications for investors' investment decisions, financial stability, and capital market credibility, while offering firms incentives to refine ESG practices, mitigate economic risks, and strengthen connections with auditors.

Accordingly, this study has both practical and methodological aims. On the practical side, it aims to clarify whether and how ESG performance can enhance audit quality and thereby improve transparency and efficiency in the capital market, and to offer practical guidance for different market participants. For corporate managers, showing how improved ESG practices can lower operational and information risks, thereby reducing audit risks and financial costs. For regulators, ESG performance can inform the design of a supervision framework and disclosure requirements that foster sustainable, high-quality economic development. For auditors, the analysis demonstrates that incorporating ESG indicators into risk assessment, audit planning, and pricing facilitates more efficient, high-quality work. On the methodological side, this study constructs an empirical framework, using fixed-effect panel regressions to identify the impact of ESG performance on audit quality. Moreover, examining the economic mechanisms underlying the relationship by modeling operational risk and information risk as mediating variables, followed by robustness, endogeneity, and heterogeneity tests.

Thus, this study addresses the three core research questions:

i. Does a firm's ESG performance affect audit quality?
ii. What factors underlie the relationship between ESG performance and audit quality?
iii. Is the relationship between ESG performance and audit quality heterogeneous?

The study makes the following contributions: First, it broadens the literature on the economic consequences of ESG performance by focusing on audit quality as a key economic outcome. Previous studies have mostly focused on how ESG performance affects a firm's development, including financial performance, corporate value, and other audit-related issues, such as audit fees and audit

opinions. Few studies have directly examined the mechanisms by which ESG performance affects audit quality. This study provides new evidence on the economic mechanisms through which ESG performance influences audit quality by eliminating operational and information risks, thereby lowering economic uncertainty and mitigating information asymmetry between firms, stakeholders, and auditors. Second, this study integrates the Chinese institutional characteristics of "regional development imbalances" and "differentiated industry regulation" and finds that the impact of ESG performance on audit quality exhibits regional and industry heterogeneity, thereby forming a localized theoretical explanatory framework. Third, this study extends the literature by developing a theoretical framework to explain the relationship between firms' ESG performance and audit quality, drawing on reputation theory, agency theory, and information asymmetry. Showing how ESG-driven reputational capital and the mitigation of agency conflicts and information asymmetry jointly promote higher audit quality and, in turn, improve capital market efficiency from an economic standpoint.

Furthermore, this study provides the following practical references. For firms, ESG should be elevated to a strategic level, and performance should be improved to gain stakeholders' trust. For audit institutions, they should maintain professional sensitivity to ESG, incorporate it into the entire audit process, and implement differentiated audit strategies for firms with different levels of ESG performance. For auditors, they should continuously update their ESG knowledge to ensure it aligns with the audit process. Finally, regulators should accelerate the development and improvement of ESG systems to promote the growth of a sustainable capital market.

The rest of the paper is organized as follows. Part 2 presents the "Literature Review and Hypothesis Development". Part 3 presents the variables and model of the study. Part 4 presents the Empirical Methodology and Results. The last part represents "Conclusions, Limitations and Future Prospects".

2. Literature Review and Hypothesis Development

2.1 ESG Performance

Most prior research has examined ESG's economic effects from a business development perspective. At the corporate level, Khalfi and Bami [8] suggest that strong ESG performance sends favorable signals to capital markets, improving transparency, accountability, organizational resilience, and overall business performance. By disclosing ESG-related information, firms can improve their reputation and obtain social recognition, thereby reducing compliance risk [7]. Aydoğmuş *et al.,* [9] further argue that higher ESG performance can enhance investor interest, improve corporate image, and influence corporate value and profitability. At the market level, Chen and Wu [10] show that corporate ESG performance correlates positively with stock price efficiency by calming investor sentiment and mitigating information asymmetry. Moreover, Tohang *et al.,* [11], based on Asian industries, noted that ESG integration into business strategies drives sustainability by improving efficiency and optimizing operations.

In contrast, Zahid *et al.,* [4], based on data from Western Europe, found that ESG activities have a detrimental effect on businesses' financial performance. Similarly, Fabozzi *et al.,* [12] noted that achieving good ESG performance requires firms to invest more in corporate governance, social responsibility, and environmental protection, which negatively affect corporate financial performance measured by ROA, ROE, and Tobin's Q, ultimately harming overall corporate performance.

2.2 Audit Quality

Lennox *et al.,* [13] defined audit quality as having three aspects: estimation of inherent and control risks, the likelihood of detecting a misstatement, and auditors' willingness to report a misstatement. According to the research by DeFond and Zhang [14], audit quality measures are based on inputs. For the audit quality measure, Song *et al.*, [15] found that superior ESG performance is associated with better firm performance, leading to enhanced transparency and reduced information asymmetry, which in turn reduces risks and further lowers audit fees. Li *et al.,* [16] reported that the richer the ESG disclosure content, the more risks auditors need to consider and the more audit procedures they will take. In addition, strong ESG performance can offer investors more accurate, reliable, and quantitative non-financial information, thereby reducing investment risks, improving investment decisions, and providing auditors with additional non-financial information to enhance audit quality [17]. Based on evidence from Canada, Ahmad *et al.,* [18] noted that audit quality is a key factor in the reliability and credibility of data disclosure related to ESG activities.

Nelson [19] identified future directions for auditing in his research: under what circumstances would more information encourage auditors to improve audit quality? Existing literature has associated ESG with audit-related outcomes through theories of reputation, agency, and information asymmetry. However, a gap remains in the literature: few studies have examined whether auditors actively or passively improve audit quality in the context of increasing ESG information disclosure, or the mechanisms by which ESG performance affects audit quality empirically. In addition, prior evidence is dominated by developed markets; researchers have paid limited attention to emerging economies. Thus, the heterogeneity associated with China's unique institutional environment and economic features warrants further investigation.

2.3 Research Hypothesis

According to reputation theory, firms actively restrain their earnings management and financial statement whitewashing to prevent the loss of reputation capital, thereby constraining auditors as well. To reduce audit risks and protect their reputations, auditors are more diligent and responsible, thereby enhancing audit quality. According to agency theory, when a firm exhibits excellent ESG performance, it indicates that the firm has a reasonable internal governance structure and can effectively address agency conflicts and restrain management. That is, auditors have more trust in the firm, subjective audit risks are reduced, more accurate audit opinions are issued, and audit quality is enhanced. In addition, from an information asymmetry perspective, Kim and Park [20] demonstrate that strong ESG performance can reduce information asymmetry, thereby enabling auditors to reduce inspection risks, cut down search and screening costs arising from information friction, and elevate audit quality. Thus, this study proposes the following hypothesis, and the conceptual framework is shown in Figure 1.

H1: There is a significant positive association between corporate ESG performance and audit quality.

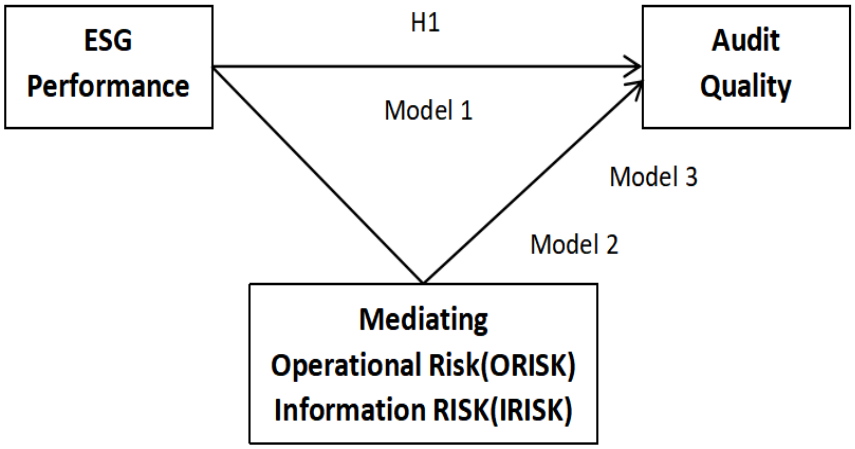

Fig. 1. Conceptual Framework

3. Research Design

3.1 Data Collection

From 2014 to 2023, 5,123 Chinese A-share listed firms provided the initial dataset. The data are derived from the CNRDS and the CSMAR. After collection, the data were systematically processed as follows: (1) excluding firms with abnormal operating conditions, including ST, *ST firms, and financial firms; (2) removing firms with missing or incomplete key data (such as ESG ratings, audit quality, corporate transparency) or those not present throughout the entire observation period; (3) winsorizing each variable at the 1% and 99% quantiles to reduce the impact of extreme values on the empirical findings. After processing, 16,754 pieces of data from 2,786 firms remained.

3.2 Definition of Variables

3.2.1 Dependent Variable

Following Wen [7], this study uses the Huazheng ESG rating index to measure firms' ESG performance. The index assigns nine grades (C-AAA) to values from 1–9 points, thereby retaining the original gradient of the rating index while meeting the quantitative requirements of empirical analysis. Higher values indicate better ESG performance.

3.2.2 Independent variable

According to research by Gul *et al.,* [21], audit quality can be measured by predicting the likelihood that an auditor will issue a standard audit opinion, then taking the negative absolute value of the difference between this prediction and the actual audit opinion. A higher value of this measurement indicates higher audit quality. The specific calculation process is outlined in Eq. (1):

$$Y_{i,t} = \alpha_0 + \alpha_1 QR_{i,t} + \alpha_2 AR_{i,t} + \alpha_3 Other_{i,t} + \alpha_4 lNV_{i,t} + \alpha_5 ROA_{i,t} + \alpha_6 LOSS_{i,t} + \alpha_7 LEV_{i,t} + \alpha_8 SIZE_{i,t} + \alpha_9 AGE + \alpha_{10}$$

$$AQ_{i,t} = -\left|Opinion_{i,t} - Y_{i,t}\right| \quad (1)$$

Here, QR is the quick ratio; AR is the ratio of accounts receivable to total assets. Other is the proportion of total assets to other receivables; INV is the ratio of inventory to total assets; ROA is return on assets; LOSS indicates whether the company reported a loss; LEV is the ratio of debt to

assets; SIZE is firm size; AGE is years since listing; and Opinion is the auditor's actual audit opinion for firm i in year t.

3.2.3 Mediating Variable

A higher level of a firm's operational risk is associated with greater volatility in its profitability. Therefore, drawing on the research of Acharya *et al.,* [22], operational risk is first calculated based on the standard deviation of the rolling EBITDA profit margin values over four years (from year t-4 to year t-1). The cumulative distribution probability of this standard deviation is outlined below:

$$ORISK_{i,t} = \sqrt{\frac{1}{T-1}\sum_{t=1}^{T}\left(E_{i,t} - \frac{1}{T}\sum_{t=1}^{T} E_{i,t}\right)^2} \text{ (T=4)} \quad (2)$$

$$E_{i,t}=\frac{EBITDA_{i,t}}{A_{i,t-1}}$$

Here, $ORISK_{i,t}$ denotes the operating risk (volatility of profitability) for firm i in year t; $EBITDA_{i,t}$ is the profits before interest, taxes, depreciation, and amortization for firm i in year t; and $A_{i,t-1}$ is the total assets for firm i in year t-1.

In terms of setting information risk variable, following Li *et al.,* [16], the study uses firms' transparency ratings from the Shanghai and Shenzhen Stock Exchanges. The four-level ratings (A-D) are assigned values from 1 to 4, where higher values represent greater information risk.

3.2.4 Control Variables

Existing studies [23,24] show diversification in the selection of control variables. This study includes several control variables: asset-liability ratio (LEV), fixed asset ratio (FAP), operating income growth rate (OICR), firm size (Size), percentage of independent directors (IDR), ownership concentration (OC), and board size (BS). Table 1 provides definitions and data sources.

Table 1
Variable Definition

Variable	Name	Definition
Dependent variable	Audit quality (AQ)	The degree of the departure between the actual audit opinion and the likelihood that an unqualified audit opinion will be issued, expressed as a negative absolute value
Independent variable	ESG performance (ESG)	Huazheng Rating Index
Mediating variable	Operational risk (ORISK)	Distribution probability of the standard deviation of the EBITDA margin
	Information risk (IRISK)	Shanghai and Shenzhen Stock Exchanges—Corporate Transparency Rating
Control variable	Operating Income Growth Rate (OICR)	(Operating income for the current period - operating income for the base period) / operating income for the base period
	Asset-liability ratio (LEV)	Total Liabilities / Total Assets
	Fixed asset ratio (FAP)	Net Fixed Assets / Total Assets
	Firm Size (Size)	The logarithm of the total assets of firms
	The percentage of independent directors (IDR)	Percentage of independent directors to board members
	Ownership concentration (OC)	The total of the top 10 owners' shareholdings
	Board size (BS)	The logarithm of the number of board members

3.3 Model Construction

Model 1 (Eq. (3) is built as follows to confirm how corporate ESG performance (ESG) affects audit quality (AQ):

$$AQ_{it} = \beta_0 + \beta_1 ESG_{it} + \beta_2 Controls_{it} + \sum Year_{it} + \sum Industry_{it} + \varepsilon_{it} \quad (3)$$

If the ESG coefficient β_1 is significantly positive, Hypothesis H1 is supported, indicating a favorable correlation between ESG and AQ.

4. Empirical Results

4.1 Descriptive Statistics

Before analysis, the data were winsorized, trimmed, and logarithmized to suppress extreme values and heteroscedasticity, thereby enhancing validity. STATA 18 data processing software was employed to describe the sample's characteristics. Table 2 describes the analysis.

Table 2
Descriptive statistics

Variable	N	Mean	Media	SD	Min	Max
AQ	16754	-0.0472	-0.0136	0.1370	-0.9520	-0.0028
ESG	16754	4.1170	4.0000	1.0430	1.0000	6.0000
IRISK	16754	1.9250	2.0000	0.6330	1.0000	4.0000
ORISK	16754	0.4740	0.4670	0.2780	0.0102	0.9880
OICR	16754	0.1470	0.0348	0.7760	-0.9070	5.9120
Lev	16754	0.4250	0.4180	0.1960	0.0619	0.8680
FAP	16754	0.0915	0.0499	0.1120	0.0000	0.5200
Size	16754	22.5500	22.3700	1.2500	20.2600	26.4100
IDR	16754	0.3770	0.3640	0.0548	0.3330	0.5710
OC	16754	0.5670	0.5700	0.1440	0.2450	0.8960
BS	16754	2.1200	2.1970	0.1930	1.6090	2.6390

The core variables in the descriptive statistics in Table 2 indicate that the maximum value of corporate audit quality (AQ) is -0.0028 and the minimum is -0.9520, suggesting significant differences in audit quality across firms. The mean value is -0.0472, which is less than the median value of -0.0136. The sample data show a left-skewed distribution, indicating that most firms' audit quality is above the average. There are notable variations in the ESG performance of various firms, as seen by the ESG value's maximum of 6.0000 and lowest of 1.0000. The mean value is 4.1170, which is greater than the median value of 4.0000. The sample data are right-skewed, indicating that most firms' ESG performance remains low, with significant room for improvement. Significant differences are also observed across other variables, indicating not only substantial disparities between firms but also affirming the rationality of the sample selection.

4.2 Correlation Analysis

The Pearson correlation test was used to explore the relationship between variables. Table 3 displays the analysis results.

At a significance level of $p<0.1$ and a correlation coefficient of 0.189, Table 3 demonstrates a strong, favorable relationship between AQ and ESG. With a correlation coefficient of -0.351 and a p-value of < 0.1, information risk (IRISK) and audit quality (AQ) show a strong negative relationship. With a correlation value of -0.118 and a significance level of $p < 0.1$, operational risk (ORISK) and audit quality (AQ) show a strong negative link.

Table 3
Correlation analysis

Variables	AQ	ESG	IRISK	ORISK	OICR	Lev	FAP	Size	IDR	OC	BS
AQ	1.000										
ESG	0.189*	1.000									
IRISK	-0.351*	-0.338*	1.000								
ORISK	-0.118*	-0.156*	0.142*	1.000							
OICR	0.034*	-0.011	-0.022*	0.025*	1.000						
Lev	-0.115*	-0.059*	0.059*	-0.080*	0.033*	1.000					
FAP	0.015*	-0.001	-0.021*	-0.067*	-0.053*	-0.086*	1.000				
Size	0.091*	0.244*	-0.263*	-0.127*	0.055*	0.485*	-0.132*	1.000			
IDR	0.011	0.082*	-0.012	0.004	-0.002	0.011	-0.023*	0.012	1.000		
OC	0.094*	0.107*	-0.169*	-0.007	-0.003	0.008	0.000	0.260*	0.035*	1.000	
BS	0.012	0.014	-0.094*	-0.069*	0.008	0.120*	0.089*	0.241*	-0.566*	0.059*	1.000

Correlation analysis reveals that only a binary linear association between variables cannot capture the complex influence mechanisms arising from interactions among multiple variables, requiring further regression analysis. Before ensuring valid regression results, a multicollinearity test was done on the variables in Table 4.

Table 4
Multicollinearity test

	VIF	1/VIF
Size	1.78	0.562
BS	1.656	0.604
IDR	1.541	0.649
Lev	1.436	0.697
IRISK	1.233	0.811
ESG	1.216	0.822
OC	1.106	0.905
ORISK	1.055	0.948
FAP	1.05	0.952
OICR	1.007	0.993
Mean VIF	1.308	0.000

The variance inflation factor (VIF) mean value is 1.308, and all variable VIF values are below the critical value of 10. The problem of multicollinearity does not exist, which offers a solid data foundation for the regression analysis that follows.

4.3 Regression Analysis

The F-test and Hausman test were combined in this work to select the optimal model. The fixed effects model was chosen over the pooled effects model based on the F-test, $F(2785, 13960) = 2.40$, with the P-value almost 0 ($P = 0.0000 < 0.05$). Moreover, the fixed effects model was preferred over the random effects model, and the null hypothesis was again rejected by the Hausman test, which yields $Chi2(9) = 110.92$ and a P-value of 0.0000 (< 0.05). Therefore, a fixed-effects model is used in this study's subsequent empirical analysis, based on the model screening procedure described above.

The study on how ESG performance affects audit quality is shown in Table 5, where column (1) does not account for the influence of other factors and does not fix time or individual impacts. Column (2) solely fixes individual effects while taking other factors into account. Only time effects are fixed in column (3), which also accounts for other factors. Column (4) fixes both individual and time effects while accounting for other factors.

With a regression coefficient of 0.0249, ESG performance (ESG) passes the test for audit quality (AQ) at the 1% significance level, as indicated in column (1), excluding the impact of other factors and without incorporating individual effects or time effects. In column (2), when controlling for other factors and fixing individual effects, ESG performance (ESG) passes the test at the 1% significance level for audit quality (AQ), with a regression coefficient of 0.0076. In column (3), when incorporating the influence of other factors and only fixing time effects, ESG performance (ESG) passes the test at the 1% significance level for audit quality (AQ), with a regression coefficient of 0.0192.

Table 5
Regression analysis

Variables	(1) AQ	(2) AQ	(3) AQ	(4) AQ
ESG	0.0249***	0.0076***	0.0192***	0.0076***
	(24.921)	(5.658)	(18.482)	(5.684)
OICR		0.0062***	0.0064***	0.0064***
		(4.759)	(4.813)	(4.893)
Lev		-0.1220***	-0.1187***	-0.1270***
		(-9.938)	(-19.261)	(-10.369)
FAP		-0.0014	0.0209**	-0.0485**
		(-0.056)	(2.236)	(-1.965)
Size		0.0065**	0.0154***	0.0251***
		(2.228)	(14.272)	(7.235)
IDR		-0.0448	-0.0151	-0.0369
		(-1.129)	(-0.654)	(-0.935)
OC		0.0769***	0.0438***	0.0360**
		(4.579)	(5.890)	(2.008)
BS		-0.0287**	-0.0072	-0.0351***
		(-2.140)	(-1.053)	(-2.628)
Constant	-0.1496***	-0.1395*	-0.4129***	-0.4842***
	(-35.308)	(-1.873)	(-16.102)	(-5.932)
Observations	16,754	16,754	16,754	16,754
R-squared	0.036	0.014	0.072	0.030
Individual FE	NO	YES	NO	YES
Year FE	NO	NO	YES	YES
F	621.1	25.67	81.05	26.72

In column (4), after controlling for other factors and fixing individual and time effects, ESG performance (ESG) passes the test at the 1% significance level for audit quality (AQ), with a regression coefficient of 0.0076. It is evident that, regardless of whether other factors are incorporated or individual and time effects are controlled for, the regression results consistently indicate a significant positive association between ESG performance (ESG) and audit quality (AQ); thus, hypothesis H1 is supported.

From an information asymmetry perspective, good ESG performance is always accompanied by greater transparency in information disclosure, thereby mitigating information asymmetry between firms and auditors [25]. This enables auditors to identify risks and reduce the likelihood of misstatements. Moreover, richer ESG-related information improves the overall information environment and strengthens auditors' ability to promote capital efficiency, ultimately enhancing audit quality. Firms with stronger ESG performance tend to have a sounder governance structure [24], which, in line with agency theory, substantially alleviates agency conflicts, reduces the inherent audit risk, and reduces managers' incentives and opportunities to manipulate earnings. Reputation theory further suggests that firms with strong ESG performance have stronger incentives to avoid

audit failures by actively cooperating with auditors and accepting more stringent audit procedures, thereby directly enhancing audit efficiency and improving overall audit quality. The results in Table 5 are consistent with the theoretical arguments and hypothesis 1, indicating that improvements in ESG performance in transparency, governance, and reputation contribute to higher audit quality and to a more transparent and efficient capital market environment.

4.4 Robustness Test

This study intends to employ the two methods listed below for robustness checks to ensure the stability of the research findings. The first is to exclude abnormal samples (2020 and 2021 excluded), given that the pandemic caused major changes in the business environment and market conditions, which may have disrupted the link between ESG performance and audit quality. Removing these years reduces the potential confounding impact of the pandemic and allows a clearer view of the relationship between ESG audit quality and the ESG audit.

The second approach is to change the estimation method by using a random-effects model. This allows comparison of results across different estimation methods and helps confirm that the findings are not dependent on specific model assumptions.

After excluding abnormal time samples (2020 and 2021), the regression coefficient between audit quality (AQ) and ESG performance (ESG) in column (1) of Table 6 is 0.0069, passing the significance test at the 1% level.

Table 6
Robustness test

Variables	(1) AQ	(2) AQ
ESG	0.0069***	0.0149***
	(4.067)	(13.201)
OICR	0.0069***	0.0061***
	(4.121)	(4.852)
Lev	-0.1248***	-0.1228***
	(-8.263)	(-16.197)
FAP	-0.0405	0.0220*
	(-1.368)	(1.816)
Size	0.0282***	0.0137***
	(6.749)	(10.292)
IDR	-0.0557	-0.0180
	(-1.121)	(-0.650)
OC	0.0275	0.0590***
	(1.260)	(6.271)
BS	-0.0386**	-0.0118
	(-2.314)	(-1.405)
Constant	-0.5320***	-0.3710***
	(-5.397)	(-11.399)
Observations	11,814	16,754
R-squared	0.035	
Individual FE	YES	YES
Year FE	YES	YES
F	23.47	

This finding is consistent with the previous regression results, indicating that the positive impact of ESG performance on audit quality remains unaffected by external shocks and reflects a stable relationship during normal economic periods. After altering the estimation method, the regression

coefficient between audit quality (AQ) and the performance of ESG (ESG) in column (2) of Table 6 is 0.0149, passing the test at the 1% significance level. Therefore, after using the random effects model, the results remain statistically significant and are not sensitive to model assumptions. Economically, this implies that the beneficial effect of ESG performance on audit quality is a persistent phenomenon of firms and the capital market, rather than the influence of a particular period or an estimation method. Given that the two above are positively associated, firms should attach greater importance to their ESG performance and integrate it into their daily operations and decision-making.

4.5 Endogeneity Test

This study considers the potential bidirectional causal relationship between ESG performance and audit quality, which may introduce endogeneity. Specifically, strong ESG performance may directly contribute to improved audit quality, while enhanced audit quality may strengthen the firm's resolve to improve ESG performance by increasing capital investment. To ensure the reliability of regression results and eliminate endogeneity bias, this study uses the instrumental variable method for endogeneity testing. The instrumental variable for endogeneity analysis is the average ESG performance (IV) of firms in the same year, province, and industry. The selection of this instrumental variable (IV) meets the requirements for both correlation and exogeneity, as firms within the same year, province, and industry are subject to the same external influencing factors. Results are presented in Table 7.

Table 7
Endogeneity test

Variables	ESG First Stage	AQ Second Stage
ESG		0.0027** (1.230)
IV	0.6560* (0.0000)	
Controls	YES	YES
Individual FE	YES	YES
Year FE	YES	YES
Kleibergen-Paap rk Wald F		8266.404 （16.380）
Kleibergen-Paap rk LM		6225.548 （0.0000）
N	16754	16754

The first step is shown in column (1) of Table 7, where the explanatory variable used to regress ESG performance (ESG) is the mean ESG performance (IV) value of firms in the same year, province, and industry. The results show a regression coefficient of 0.6560 between the instrumental variable and the original explanatory variable, passing the test at the 10% significance level, indicating a strong and economically meaningful positive association between firms' ESG performance and local ESG environment. Additionally, the F-value of the second-stage regression exceeds the critical value of 16.380, passing the weak instrumental variable test. The Kleibergen-Paap rk LM P-value is 0.0000, which is less than 0.1, indicating that the model is not underidentified.

Column (2) represents the second stage, in which the instrumental variable (IV) is regressed with the explained variable (AQ). The regression coefficient between the two, according to the results, is 0.0027, passing the test at the 5% significance level. The findings suggest that the instrumental variable is reasonable. After controlling for endogeneity issues, the positive correlation between the

two above remains evident and suggests that the effect of ESG performance on audit quality is not driven by bidirectional causality. Stricter ESG norms across years, regions, and industries prompt firms to implement more transparent disclosure and stronger government oversight, alleviating information asymmetry and agency frictions and ultimately lowering audit risks. Thereby contributing to a more transparent and efficient capital market and further promoting high-quality economic development.

4.6 Mechanism Analysis

The quality of audits depends on the effectiveness of external auditors [25]. The mechanism through which a firm's ESG performance influences audit quality essentially involves systematically mitigating the firm's operational and information risks. This provides auditors with a more stable risk environment and a more transparent informational foundation, thereby enhancing their capacity to identify risks and address material misstatements, and further improving audit quality. This study conducts a detailed analysis from two perspectives: operational risk and information risk.

Better ESG performance can systematically reduce a firm's operational risks. According to stakeholder theory, firms with strong ESG performance proactively respond to the demands of various stakeholders. They typically maintain close ties with government regulatory authorities. Those with better ESG performance take the initiative to enhance environmental compliance, thereby avoiding potential environmental risks such as fines, production halts, and shutdowns caused by environmental issues, effectively blocking the path from environmental risk to operational risk. By providing employees with reasonable compensation, occupational safety, and development opportunities, firms can boost employee motivation and performance [14], thereby enhancing operational stability.

Furthermore, the disclosure of firms' ESG reports alleviates problems between enterprises and stakeholders [26], such as suppliers and consumers, fosters alignment of values, consolidates market share, and enhances risk-resistance capabilities, thereby preventing operational difficulties. In the principal-agent theory, to improve the firm's operational management, the principal authorizes the firm to an agent with professional experience. A major source of operational risk is the conflict of interest that exists between the principal and the agent. The agent may sacrifice the firm's long-term interests for personal gain, thereby amplifying operational uncertainty. Good ESG performance indicates that the firm has a relatively sound corporate governance system and a high level of internal control, which can effectively supervise and manage the agent, thereby effectively mitigating the principal-agent problem and reducing operational risks.

A firm's information risk can be systematically decreased by improving ESG performance. Referring to information asymmetry and information transmission theories, the information gap is an important source of information risk. Firms with better ESG performance typically have less asymmetric information and more reliable information disclosure operations [27]. They proactively disclose high-quality non-financial information and convey it externally. Since firms have more internal information advantages than external stakeholders, improved ESG performance reduces information asymmetry, increasing the effectiveness and fairness of both financial and non-financial information. In addition, alleviating information asymmetry promotes internal firm transparency, curbs earnings management, and helps control agency problems while reducing information risk.

In summary, better corporate ESG performance reduces operational and information risks, providing auditors with a more reliable audit environment and more sufficient information support. Auditors can more accurately identify the risk of financial misstatements, implement audit

procedures more effectively, and conduct more thorough risk assessments, thereby enhancing audit quality.

This study selects two sets of mediating variables for mechanism analysis. The first set is corporate operational risk (ORISK), measured by the distribution probability of the standard deviation of the EBITDA margin. The second set is corporate information risk (IRISK), measured by corporate transparency ratings published by the Shanghai and Shenzhen Stock Exchanges.

To verify the mediating role of operational risk (ORISK) and information risk (IRISK) between corporate ESG performance (ESG) and audit quality (AQ), Models 2 and 3 - Eq. (4) and Eq. (5), respectively - are constructed as follows:

$$Med_{it} = \beta_0 + \beta_1 ESG_{it} + \beta_2 Controls_{it} + \sum Year_{it} + \sum Industry_{it} + \varepsilon_{it} \quad (4)$$

$$Med_{it} = ORISK_{it}(IRISK_{it})$$

$$AQ_{it} = \beta_0 + \beta_1 ESG_{it} + \beta_2 Med_{it} + \beta_3 Controls_{it} + \sum Year_{it} + \sum Industry_{it} + \varepsilon_{it} \quad (5)$$

At least some of the influence of the firm's ESG performance (ESG) on audit quality (AQ) is achieved through the mediating effect if the ESG coefficient β_1 in model (4) and the Med coefficient β_2 in model (5) are both significantly negative. The following is the mechanism analysis.

Operational and information risks mediate the positive correlation between audit quality and ESG performance, as shown in Tables 8 and 9. In column (2) of Tables 8 and 9, the correlation coefficients between operational risk (ORISK), information risk (IRISK), and ESG performance (ESG) are negative at the 1% significance level, indicating that when a firm has better ESG performance, its operational risk and information risk are relatively lower. This demonstrates that the mediating effects of information and operational risk contribute to the ESG on AQ.

Table 8
Mechanism test of ORISK

Variables	(1) AQ	(2) ORISK
ESG	0.0076***	-0.0109***
	(5.684)	(-4.851)
OICR	0.0064***	0.0015
	(4.893)	(0.683)
Lev	-0.1270***	0.2120***
	(-10.369)	(10.286)
FAP	-0.0485**	-0.3188***
	(-1.965)	(-7.677)
Size	0.0251***	-0.0332***
	(7.235)	(-5.677)
IDR	-0.0369	-0.0420
	(-0.935)	(-0.633)
OC	0.0360**	0.1148***
	(2.008)	(3.806)
BS	-0.0351***	0.0026
	(-2.628)	(0.115)
Constant	-0.4842***	1.1457***
	(-5.932)	(8.340)
Observations	16,754	16,754

Table 8
Continued

Variables	(1) AQ	(2) ORISK
R-squared	0.030	0.015
Individual FE	YES	YES
Year FE	YES	YES
F	26.72	13.31

Economically, better ESG performance dampens fluctuations in firms' operational conditions by fostering more stable stakeholder engagement, stronger compliance, and stricter internal controls, thereby reducing operational uncertainty that auditors must consider. Moreover, better ESG performance has a substantial effect on the transparency and reliability of corporate information disclosure that stakeholders and auditors need. Ultimately, by reducing operational and information risks, better ESG performance improves the effectiveness of audits, enhances the credibility of financial reporting, and contributes to a more efficient and transparent capital environment.

Table 9
Mechanism of IRISK

Variables	(1) AQ	(2) IRISK
ESG	0.0076***	-0.0671***
	(5.684)	(-13.011)
OICR	0.0064***	-0.0261***
	(4.893)	(-5.171)
Lev	-0.1270***	0.3521***
	(-10.369)	(7.454)
FAP	-0.0485**	0.1378
	(-1.965)	(1.449)
Size	0.0251***	-0.0971***
	(7.235)	(-7.246)
IDR	-0.0369	0.1091
	(-0.935)	(0.717)
OC	0.0360**	-0.3316***
	(2.008)	(-4.796)
BS	-0.0351***	-0.0289
	(-2.628)	(-0.561)
Constant	-0.4842***	4.3145***
	(-5.932)	(13.704)
Observations	16,754	16,754
R-squared	0.030	0.033
Individual FE	YES	YES
Year FE	YES	YES
F	26.72	29.36

Operational and information risks mediate the positive correlation between audit quality and ESG performance, as shown in Tables 8 and 9. In column (2) of Tables 8 and 9, the correlation coefficients between operational risk (ORISK), information risk (IRISK), and ESG performance (ESG) are negative at the 1% significance level, indicating that when a firm has better ESG performance, its operational risk and information risk are relatively lower. This demonstrates that the mediating effects of information and operational risk contribute to the ESG on AQ. Economically, better ESG performance dampens fluctuations in firms' operational conditions by fostering more stable stakeholder

engagement, stronger compliance, and stricter internal controls, thereby reducing operational uncertainty that auditors must consider. Moreover, better ESG performance has a substantial effect on the transparency and reliability of corporate information disclosure that stakeholders and auditors need. Ultimately, by reducing operational and information risks, better ESG performance improves the effectiveness of audits, enhances the credibility of financial reporting, and contributes to a more efficient and transparent capital environment.

4.7 Heterogeneity Test

4.7.1 Heterogeneity Test Based on Regions

The National Bureau of Statistics primarily categorizes regions in China by their level of economic development and their status and tasks in national development. Therefore, this study categorizes firms into three major types: the Eastern regions, Western regions, and Mid regions, and then conducts a detailed analysis.

ESG performance (ESG) and audit quality (AQ) have a correlation coefficient of 0.0071 for the Eastern area group, as shown in Table 10, which is significant at the 1% level. At the 5% level, the correlation coefficient for the group of Western and Mid regions is significant. Corporate ESG performance (ESG) has a stronger positive impact on audit quality (AQ) in the Eastern area than in the Western or Mid regions. This may be because the Eastern region has high levels of economic development and marketization [28], as well as stronger regulatory frameworks and unique resource endowments [29]. These unique factors prompt firms in the Eastern region to place greater importance on ESG information disclosure and to strengthen the mechanism by which ESG performance improves audit quality, thereby reducing operational and information risks.

Table 10
Heterogeneity test based on regions

Variables	(1) Eastern	(2) Western	(3) Mid
ESG	0.0071***	0.0097**	0.0068**
	(4.435)	(2.407)	(2.190)
OICR	0.0050***	0.0115***	0.0043
	(3.178)	(3.503)	(1.198)
Lev	-0.1064***	-0.1877***	-0.1272***
	(-7.209)	(-5.221)	(-4.251)
FAP	-0.0490	-0.0823	0.0042
	(-1.587)	(-1.225)	(0.077)
Size	0.0366***	-0.0387***	0.0294***
	(8.915)	(-3.603)	(3.361)
IDR	-0.0183	-0.0597	-0.1160
	(-0.392)	(-0.493)	(-1.225)
OC	0.0383*	-0.0095	0.0822**
	(1.769)	(-0.171)	(2.030)
BS	-0.0526***	0.0082	-0.0270
	(-3.306)	(0.194)	(-0.867)
Constant	-0.7083***	0.8606***	-0.5966***
	(-7.340)	(3.289)	(-2.936)
Observations	11,805	2,219	2,730
R-squared	0.036	0.050	0.027
Individual FE	YES	YES	YES
Year FE	YES	YES	YES
F	23.05	5.853	3.915

By contrast, ESG practices and information disclosure may be less standardized and less closely monitored in the Western and Mid regions, where economic development, regulations, and market maturity are relatively weaker. Therefore, the ability of ESG performance to reduce operational and information risks and thus enhance audit quality remains limited.

4.7.2 Heterogeneity Test Based on High-Tech and Non-High-Tech Industries

Firms in the fields of software, information technology, and information transmission, as well as technical services and scientific research, were categorized as high-tech firms in this study. Others were categorized as non-high-tech firms.

Table 11
Heterogeneity test based on High-tech and Non-high-tech industries

Variables	(1) Non-high-tech	(2) High-tech
ESG	0.0036*	0.0102***
	(1.688)	(5.923)
OICR	0.0050***	0.0061***
	(2.856)	(3.057)
Lev	-0.0561***	-0.1608***
	(-2.903)	(-9.805)
FAP	-0.0138	-0.0793**
	(-0.340)	(-2.493)
Size	0.0214***	0.0286***
	(3.809)	(6.147)
IDR	0.0965	-0.1152**
	(1.546)	(-2.224)
OC	0.0411	0.0238
	(1.387)	(1.006)
BS	0.0050	-0.0530***
	(0.231)	(-3.098)
Constant	-0.5668***	-0.4747***
	(-4.350)	(-4.302)
Observations	6,976	9,778
R-squared	0.012	0.048
Individual FE	YES	YES
Year FE	YES	YES
F	4.283	25.39

According to Table 11, ESG performance (ESG) and audit quality (AQ) exhibit a correlation coefficient of 0.0036 in the non-high-tech industry group, which is significant at the 10% level. ESG performance (ESG) and audit quality (AQ) have a 0.0102 correlation coefficient for the high-tech industry group, which is significant at the 1% level. Therefore, the favorable effect of corporate ESG performance (ESG) on audit quality (AQ) is more noticeable in high-tech industries than in non-high-tech industries. Possible reasons include the following. First, high-tech industries typically require substantial R&D investment to support business operations, with long, uncertain cycles to achieve transformation, which exposes them to higher operational and information risks. With better ESG performance, high-tech firms can strengthen internal controls over R&D activities and alleviate information asymmetry in long-term projects, thereby reducing auditors' risk and supporting higher audit quality. Second, due to their core position in national development, high-tech industries often face more stringent market supervision, forcing firms to demonstrate more authentic ESG performance and to disclose more transparent information. Finally, recognizing the substantial

reputational losses and economic costs of audit failures in innovation-driven and strategically important sectors, auditors tend to maintain a high level of professional sensitivity to high-tech industries and implement more rigorous audit procedures, thereby improving audit quality.

4.7.3 Heterogeneity Test Based on Heavily-Polluting and Non-Heavily-Polluting Industries

The Industry Classification Guidelines for Listed Firms in 2012 divide firms into heavily and non-heavily polluting categories [30].

Table 12
Heterogeneity test based on heavily-polluting and non-heavily-polluting industries

Variables	(1) Non-heavily polluting	(2) Heavily polluting
ESG	0.0092***	0.0036
	(5.855)	(1.419)
OICR	0.0059***	0.0090***
	(3.925)	(3.420)
Lev	-0.0868***	-0.1982***
	(-5.912)	(-8.349)
FAP	0.0050	-0.1304***
	(0.156)	(-3.319)
Size	0.0344***	-0.0108
	(8.338)	(-1.568)
IDR	-0.0348	0.0358
	(-0.762)	(0.450)
OC	0.0363*	0.0107
	(1.671)	(0.324)
BS	-0.0411***	0.0156
	(-2.642)	(0.592)
Constant	-0.6987***	0.2422
	(-7.283)	(1.458)
Observations	12,865	3,889
R-squared	0.033	0.041
Individual FE	YES	YES
Year FE	YES	YES
F	22.80	8.576

According to Table 12, ESG performance (ESG) and audit quality (AQ) have a 0.0092 correlation coefficient for the non-heavily polluting industrial group, which is significant at the 1% significance level. The correlation coefficient between audit quality (AQ) and ESG performance (ESG) in the heavily polluting industrial category is 0.0036, which is not significant. Compared with heavily polluting industries, the promoting effect of corporate ESG performance (ESG) on audit quality (AQ) is more significant in non-heavily polluting industries. In those industries, ESG performance is typically more balanced across the environment, social, and governance dimensions, providing auditors with a more comprehensive understanding of firms, enabling them to identify risks better and ultimately design more targeted audit procedures to enhance audit quality.

By contrast, ESG practices in heavily polluting industries are often skewed toward environmental issues, while the social and governance dimensions are less fully developed, making ESG performance a less comprehensive measure of overall corporate behavior. Additionally, there is greater pressure on heavily polluting sectors to greenwash their ESG performance, and the spread of misleading information may reduce audit quality.

5. Conclusions

5.1 Conclusions

This study examines how corporate ESG performance affects audit quality and the mechanisms underlying this effect. The following findings are reached:

First, there is a strong positive association between firms' ESG performance and audit quality, indicating that higher audit quality is associated with better ESG performance. This relationship remains robust after controlling for endogeneity, adjusting for different estimation methods, and excluding abnormal samples. From an economic perspective, in the model that controls for both individual and time effects, ESG performance has a favorable impact on audit quality, as evidenced by an average increase in audit quality (AQ) of 0.0076 per 1-point increase in the ESG score. Excellent ESG performance reduces the risk of material misstatement, improves audit efficiency, lowers the likelihood of issuing non-standard opinions, and ultimately enhances audit quality. It also allows auditors to identify risks and apply appropriate audit procedures more accurately.

Second, the mechanism analysis reveals that ESG performance affects audit quality by reducing operational and information risks, thereby systematically lowering operational volatility and enhancing informational transparency. From an economic perspective, the analysis above shows that these risk-mitigating effects reduce losses arising from material misstatements, reduce auditors' information-acquisition costs, and enhance audit-process efficiency. For firms with better ESG performance, this enables auditors to allocate resources more efficiently, identify risks more precisely, and issue higher-quality audit opinions. Ultimately, improving the overall external assurance within the capital market.

Third, the heterogeneity analysis shows that eastern regions, high-tech sectors, and non-heavily polluting industrial fields have a stronger positive impact on audit quality from corporate ESG performance. This difference stems from China's unique institutional environment: the economies of the eastern regions are more developed, more market-oriented, and subject to more stringent regulations, so ESG information is more credible and more frequently used by market participants and auditors, contributing to the improvement of audit quality; High-tech firms must innovate continuously [31] and have longer investment cycles, so improvements in ESG performance have stronger marginal effects in stabilizing operations and enhancing transparency, which in turn reflected in the improvement of audit quality. Non-heavily polluting industries tend to have more comprehensive and balanced ESG performance across environment, social, and governance dimensions, providing auditors with more reliable non-financial information. In contrast, heavily polluting industries may engage in ESG greenwashing, which weakens the effectiveness of the information for audit quality.

5.2 Limitations and Future Prospects

Certain limitations remain in this study, which can help guide future research. First, non-listed firms and market entities from other nations are not included in the research sample - only A-share listed firms in China from 2014 to 2023 are chosen; thus, conclusions may lack universality. Second, in terms of variable measurement, this study relies on the Huazheng index, a widely used and relatively authoritative measure of ESG performance. However, given that ESG ratings can be affected by firms' inadequate disclosure, subjective evaluations, and even fraudulent behavior, potential errors in ESG data may affect the estimated relationship between ESG performance and audit quality. Finally, although the robustness test has been passed by changing the estimation method and excluding abnormal samples, and the endogeneity problem has been addressed using

the instrumental variable method, further study is still needed to determine whether different ESG ratings influence audit quality and whether the relationship has a lag.

Future research can be extended in several ways: first, the sample boundary can be expanded by including non-listed firms and firms from other countries, and by using multi-source data to cross-validate the relationship between the two and its impact mechanism. Second, the influence of ESG rating divergence from different ESG rating institutions can be further examined. In particular, the ways in which evaluation results across institutions shape the relationship between audit quality and ESG performance can be compared. Third, dynamic panel models can be used to incorporate lagged ESG performance into the benchmark model. Finally, the time lag characteristics of ESG performance can be identified by gradually increasing the lag order and testing the significance of the coefficients.

Author Contributions

Conceptualization, Q.C. and W.S.; Methodology, Q.C. and W.S.; Software W.S.; Validation, Q.C. and W.S.; Formal analysis, W.S.; Data curation, Q.C.; Writing-review and editing, Q.C. and W.S.; Visualization, Q.C. and W.S.; Supervision, Q.C.; Project administration, W.S.; Funding acquisition, Q.C. and W.S. All authors have read and agreed to the published version of the manuscript.

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Conflicts of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have influenced the work reported in this paper.

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References

[1] Li, Y., Zhao, Y., Ye, C., Li, X., & Tao, Y. (2024). ESG ratings and the cost of equity capital in China. *Energy Economics, 136*, 107685. https://doi.org/10.1016/j.eneco.2024.107685

[2] Friede, G., Busch, T., & Bassen, A. (2015). ESG and financial performance: aggregated evidence from more than 2000 empirical studies. *Journal of Sustainable Finance & Investment, 5*(4), 210-233. https://doi.org/10.1080/20430795.2015.1118917

[3] Landi, G., & Sciarelli, M. (2019). Towards a more ethical market: the impact of ESG rating on corporate financial performance. *Social Responsibility Journal, 15*(1), 11-27. https://doi.org/10.1108/SRJ-11-2017-0254

[4] Zahid, R. M. A., Khan, M. K., Anwar, W., & Maqsood, U. S. (2022). The role of audit quality in the ESG-corporate financial performance nexus: Empirical evidence from Western European companies. *Borsa Istanbul Review, 22*, S200-S212. https://doi.org/10.1016/j.bir.2022.08.011

[5] Diab, A., & Eissa, A. M. (2023). ESG Performance, Auditor Choice, and Audit Opinion: Evidence from an Emerging Market. *Sustainability, 16*(1). https://doi.org/10.3390/su16010124

[6] Yin, X.-N., Li, J.-P., & Su, C.-W. (2023). How does ESG performance affect stock returns? Empirical evidence from listed companies in China. *Heliyon, 9*(5), e16320. https://doi.org/10.1016/j.heliyon.2023.e16320

[7] Kong, W. (2023). The impact of ESG performance on debt financing costs: Evidence from Chinese family business. *Finance Research Letters, 55*, 103949. https://doi.org/10.1016/j.fr1.2023.103949

[8] Khalfi, A., & Bami, A. (2025). Environmental, social, and governance (ESG) in corporate governance: a framework for resilience. *GeoJournal, 90*(5), 1-19. https://doi.org/10.1007/s10708-025-11474-7
[9] Aydoğmuş, M., Gülay, G., & Ergun, K. (2022). Impact of ESG performance on firm value and profitability. *Borsa Istanbul Review, 22*, S119-S127. https://doi.org/10.1016/j.bir.2022.11.006
[10] Chen, S., & Wu, Z. (2025). Corporate ESG performance and stock pricing efficiency. *The North American Journal of Economics and Finance*, 102440. https://doi.org/10.1016/j.najef.2025.102440
[11] Tohang, V., Adhariani, D., & Violita, E. S. (2025). Environmental, Social, and Governance (ESG) Strategies for Driving Business Performance: Evidence From the Communication Services Industry in Asia. *Business Strategy & Development, 8*(2), e70106. https://doi.org/10.1002/bsd2.70106
[12] Fabozzi, F. J., Ng, P. W., & Tunaru, D. E. (2022). The impact of corporate social responsibility on corporate financial performance and credit ratings in Japan. In *Risks related to environmental, social and governmental issues (ESG)* (pp. 3-19). Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-18227-3_2
[13] Lennox, C. S., Li, C., & Wang, Y. (2025). *A survey of the archival audit literature* [Manuscript submitted for publication]. Available at SSRN 5375786.
[14] DeFond, M., & Zhang, J. (2014). A review of archival auditing research. *Journal of Accounting and Economics, 58*(2-3), 275-326. https://doi.org/10.1016/j.jacceco.2014.09.002
[15] Song, Y., Wu, H., & Ma, Y. (2023). Does ESG performance affect audit pricing? Evidence from China. *International Review of Financial Analysis, 90*, 102890. https://doi.org/10.1016/j.irfa.2023.102890
[16] Li, J., Wu, L., & Xiao, S. (2024). Does Corporate ESG Performance Affect the Disclosure of Key Audit Matters? *Journal of Audit & Economics, 39*(01), 23-31. https://link.cnki.net/urlid/32.1317.F.20231227.1112.008
[17] Hu, Y., & Ran, J. (2024). Research Status and Prospects of the Impact of ESG Ratings on Auditing. *Friends of Accounting, (18)*, 104-111. https://link.cnki.net/urlid/14.1063.F.20240823.1312.028
[18] Hammami, A., & Hendijani Zadeh, M. (2020). Audit quality, media coverage, environmental, social, and governance disclosure, and firm investment efficiency: Evidence from Canada. *International Journal of Accounting & Information Management, 28*(1), 45-72. https://doi.org/10.1108/IJAIM-03-2019-0041
[19] Nelson, M. W. (2025). Experimental and Archival Research in Auditing: Complementarities, Convergence, and Future Directions. *The Accounting Review, 100*(6), 385-403. https://doi.org/10.2308/TAR-2025-0477
[20] Kim, J. W., & Park, C. K. (2023). Can ESG performance mitigate information asymmetry? Moderating effect of assurance services. *Applied Economics, 55*(26), 2993-3007. https://doi.org/10.1080/00036846.2022.2107991
[21] Gul, F. A., Wu, D., & Yang, Z. (2013). Do individual auditors affect audit quality? Evidence from archival data. *The Accounting Review, 88*(6), 1993-2023. https://hdl.handle.net/10536/DRO/DU:30080007
[22] Acharya, V. V., Amihud, Y., & Litov, L. (2011). Creditor rights and corporate risk-taking. *Journal of Financial Economics, 102*(1), 150-166. https://doi.org/10.1016/j.jfineco.2011.04.001
[23] Gidage, M., & Bhide, S. (2025). Exploring the ESG–audit fees nexus: insights from Indian firms. *Managerial Auditing Journal*. https://doi.org/10.1108/MAJ-09-2024-4510
[24] Wang, W., Yu, Y., & Li, X. (2022). ESG performance, auditing quality, and investment efficiency: Empirical evidence from China. *Frontiers in Psychology, 13*, 948674. https://doi.org/10.3389/fpsyg.2022.948674
[25] Cai, C., Hazaea, S. A., Alsayegh, M. F., Sahu, M., Raid, M., & Al-ahdal, W. M. (2024). Media coverage as a moderator in the nexus between audit quality and ESG performance: Evidence from China. *PloS One, 19*(10). https://doi.org/10.1371/journal.pone.0312510
[26] Gao, J. Y., Chu, D. X., Lian, Y. H., & Zheng, J. (2021). Can ESG performance improve corporate investment efficiency. *Securities Market Herald, 11*(1), 24-34.
[27] Bilyay-Erdogan, S., Danisman, G. O., & Demir, E. (2024). ESG performance and investment efficiency: The impact of information asymmetry. *Journal of International Financial Markets, Institutions and Money, 91*, 101919.
[28] Wang, Y., Lin, Y., Fu, X., & Chen, S. (2023). Institutional ownership heterogeneity and ESG performance: Evidence from China. *Finance Research Letters, 51*, 103448. https://doi.org/10.1016/j.frl.2022.103448
[29] Yuan, H., Luan, H., & Wang, X. (2024). The Impact of ESG Rating Events on Corporate Green Technology Innovation under Sustainable Development: Perspectives Based on Informal Environmental Regulation of Social Systems. *Sustainability, 16*(19), 8308. https://doi.org/10.3390/su16198308
[30] Wang, X., Phua, L. K., & Wang, C. (2024). Environmental, social, and governance (ESG) performance as a moderator in assessing the impact of government subsidies on underinvestment in China. *Heliyon, 10*(17). https://doi.org/10.1016/j.heliyon.2024.e36798
[31] Xu, K., Liu, Y., & Liu, Z. (2023). Dynamic game model for R&D strategy in high-tech enterprises. *Journal of Difference Equations Applications, 29*(2), 143-164. https://doi.org/10.1080/10236198.2023.2182152