

Does ESG performance reduce audit costs

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Abstract: This paper explores the relationship between ESG performance and corporate audit fees based on the data of A-share listed companies in Shanghai and Shenzhen in China from 2010 to 2020. The results show that firms with higher ESG levels have lower audit fees, and this relationship is more significant in non-state enterprises. The impact mechanism test confirms that ESG performance affects the level of corporate audit fees mainly through two paths: reducing business risks and enhancing corporate reputation. The heterogeneity test shows that the suppressive effect of ESG on audit fees is more significant in firms whose audit firms are the "Big Four". The findings provide a theoretical basis for the study of the economic consequences of ESG and the factors influencing audit fees.

Keywords: ESG performance; Audit fees; Operational risk.

1. Introduction

Against the backdrop of global climate change and increasing resource consumption, environmental, social and corporate governance elements are receiving widespread attention around the world. China's 14th Five-Year Plan and 2035 Vision highlights the theme of high-quality development and proposes to transform the construction of ecological civilization to green and low-carbon direction to ensure the realization of the national "double carbon" strategic goals. In this context, ESG (Environmental, Social and Governance) is an evaluation system that focuses on environmental, social and corporate governance, which is increasingly preferred by many people. Unlike the previous profit concept, ESG rating takes into account the financial and social effects of a company, providing a broader perspective for investors to understand the company and make investment decisions. It has been shown that high-quality ESG performance can help companies reduce the risk of non-compliance and financial distress [1], enhance corporate value [2], reduce the cost of debt financing [3], promote corporate green innovation [4], and improve investment efficiency [5]. However, most of the studies on the economic consequences of ESG have been conducted based on the internal perspective of firms, and few have explored the economic consequences of ESG from an external perspective.

As an independent third-party institution, audit firms are not only the main intermediaries in China's securities market, but also the main users of environmental quality assessment information in China's securities market, and can provide credible assurance services on the information disclosed by enterprises [6]. In the context of China's "dual carbon" strategy, the sustainability of enterprises is highly valued, and the environmental benefits brought by the production and operation of enterprises will be an important assessment index compared with the previous financial indexes. Therefore, third-party auditors also pay attention to the ESG performance of companies in the course of their audit work. As the audit market becomes more competitive, audit fees are becoming an important factor in measuring the quality of audit services. It has been confirmed that the larger the company, the greater the degree of surplus management and the greater the operational risk, the higher the audit fee [7]. A review of existing studies reveals that there is no shortage of

literature on the impact on audit fees from the perspective of internal characteristics and governance structure of firms, but there is a paucity of literature on the relationship between the two from the perspective of ESG ratings.

Based on this, this paper selects the panel data of A-share listed companies in China from 2011 - 2020 as the research sample, integrates the ESG performance of companies and audit fees into the same research framework, analyzes the impact of ESG performance on audit fees, and explores the impact of different nature of corporate ownership on the relationship between the two. The marginal contributions of this paper are mainly: first, to expand the existing empirical evidence on the economic consequences of ESG performance, as most of the existing literature takes the aspect of corporate performance and few perspectives focus on the impact on third-party independent auditors. Second, the economic consequences of ESG performance are used as a guide to validate the mechanism underlying the effect of ESG on audit fees, in order to seek improvement methods through scientific paths. It helps enterprises to make better economic decisions, realize the organic unification of environmental and economic benefits of enterprises, and promote the process of sustainable development of enterprises.

2. Theoretical analysis and research hypothesis

In the context of the country's active promotion of the "dual carbon" strategy, the ESG concept has been widely recognized and applied in the company's investment decision and risk management, and ESG performance has gradually become one of the most important asset evaluation indicators of the company [8]. In the process of auditing companies, external auditors inevitably need to pay attention to the operating conditions of companies. The importance of ESG performance for auditors is evident from the fact that a company's performance in terms of ESG can not only directly influence its behavior and performance, but also provide auditors with a wealth of information. So, how will a company's ESG performance affect external audit fees? This paper will analyze it from the perspective of business risk and corporate reputation. First, from the perspective of business risk. According to the audit risk model, audit risk is determined by inherent risk, control risk and inspection risk,

where inherent risk and control risk are the objective business risks of the audited entity [9]. The auditor invests resources in the audit process mainly based on the business risk of the enterprise and its own risk of audit misstatement, and the audit fee is usually used as an important measure of the auditor's resource investment [10], which shows that the business risk of the enterprise will have an important impact on the auditor's pricing. Previous studies have also confirmed that the higher the operational risk, the higher the third-party audit fees [11]. Companies with good ESG performance usually have stronger profitability and sustainability, and their internal governance structure is usually more standardized and the risk management system is more perfect. A good level of internal governance and risk prevention mechanism can make the company more resilient in the face of external risks, which can effectively reduce the risk of financial distress and operational risks. At the same time, improved sustainability gives companies a stronger ability to cope with uncertainty in the external environment, which reduces the risk of audit failure and thus audit costs [12].

Second, based on the perspective of corporate reputation. Good ESG performance has a certain signaling effect. In the process of environmental information disclosure, enterprises can send a signal of transparent information and good management, establish a good image of actively fulfilling social responsibility and protecting the environment, and help enhance their corporate reputation. On the one hand, companies with higher reputation are more likely to attract the attention of investors and customers and obtain more financing opportunities for the company. At the same time, they maintain stable and continuous good relationships with suppliers and customers, and when suffering from external economic shocks, stakeholders will tend to give support to companies with better reputation and reduce their business risks [3], making auditors spend significantly less time and effort in conducting audits, which is expressed as less audit fees [13]. On the other hand, reputable companies, in order to maintain their own reputation level from being damaged, will tend to take the initiative to assume social responsibility and actively disclose environmental responsibility information, which manifests itself in a higher level of ESG performance, thus reducing the degree of information asymmetry inside and outside the company [14], sending a signal of management integrity to the auditor, allowing the auditor to work in a more transparent environment, reducing the investment of audit resources with a consequent reduction in audit fees.

On the one hand, good ESG performance can reduce the financial and information risks in the business process and reduce the audit risk premium; on the other hand, it can bring about the accumulation of reputational capital for the company, which can send a signal of good management to the outside world and reduce the degree of information asymmetry, thus reducing the investment of audit resources. The final performance is the reduction of audit costs. Based on this, this paper proposes the following hypotheses:

H1: ESG performance can significantly reduce a company's audit fees, i.e., the better the ESG performance, the lower the external audit fees paid by the company.

3. Research Design

3.1. Sample selection and data sources

In this paper, the data of A-share listed companies in Shanghai and Shenzhen from 2010 - 2020 are selected as the

initial sample, and the following companies are excluded according to the research practice: (1) companies in the financial and insurance industry; (2) companies with missing data; (3) ST, PT companies and delisted companies, and finally 26,051 research samples are obtained. Among them, ESG performance data were obtained from Wind database; corporate audit fees and control variables were mainly obtained from Cathay (CSMAR) database. In order to eliminate the possible influence of extreme values on the study findings, all continuous variables of the statistical model are Winsorized (Winsorize) at the upper and lower 1% percentile, and data are combined and statistically analyzed using STATA16 software.

3.2. Selection and description of variables

3.2.1. Explained variable: audit fees (Lnfee)

In this paper, the sum of total annual fees paid by listed companies to auditors is selected for measurement with reference to the studies of existing scholars. Also, to mitigate the possible impact of data heteroskedasticity on the experimental results, the sum of audit fees is treated as the natural logarithm.

3.2.2. Explanatory variables: ESG performance (ESG)

Since the coverage of CSI ESG data is wider, the update speed is more frequent, and the sample size is larger. Accordingly, this paper selects the results of CSI ESG ratings as the explanatory variables and classifies the ratings into nine grades from C to AAA. This paper draws on the method of Wang Bo et al [15], which assigns the nine grades from low to high in order of 1-9.

3.2.3. Intermediate variables

This paper argues that both operational risk and corporate reputation will have a certain mediating effect on the role between ESG performance and corporate audit fees, and refers to the study of Wang Zhuquan et al. (2017) [16], which used earnings volatility (Risk) to measure corporate operational risk; meanwhile, referring to the studies of Qu Wen and Chang Lijuan (2015) [17] and Guan Kaolei and Zhang Rui (2019) [18], 12 corporate reputation evaluation indicators were selected by considering the evaluation of corporate reputation by various stakeholders, and the corporate reputation score (Rep) was calculated by using factor analysis on them.

3.2.4. Control variables

There are many other factors that have an impact on firms' audit fees, and these variables need to be controlled for in the subsequent empirical study. In this paper, we mainly selected firm size (Size), firm age (Age), balance sheet ratio (Lev), TobinQ, firm growth (Growth), total asset turnover ratio (Ato), cashflow ratio (Cashflow), cashflow ratio (Bm) independent director ratio (Indep), board size (Board), separation of powers (Dual), percentage of shares held by the first largest shareholder (Top1), industry (Indcd) and year (Year) as control variables. The relevant variables are defined in Table 1.

3.3. Model Design

In order to investigate the relationship between ESG performance and corporate audit fees, the following model is constructed in this paper.

$$\begin{aligned} Lnfee = & \alpha_0 + \alpha_1 ESG + \alpha_2 Size + \alpha_3 Age + \alpha_4 Lev + \alpha_5 Ato + \alpha_6 Growth \\ & + \alpha_7 Tobinq + \alpha_8 Bm + \alpha_9 Cashflow + \alpha_{10} Indep + \alpha_{11} Board \\ & + \alpha_{12} Dual + \alpha_{13} Top1 + \sum year + \sum indcd + \mu \end{aligned} \quad (1)$$

Where α_0 is the constant term of the model and μ is the

perturbation term, and the hypothesis holds when α_1 is significantly negative.

4. Empirical Results and Analysis

4.1. Descriptive Statistics

Table 2 presents the results of descriptive statistics of the relevant variables, and the results from the table show that the mean value of audit fees (Lnfee) is 13.77 and the median is

13.66, with a mean value greater than the median, indicating a right-skewed distribution of audit fee levels in the sample companies; the mean value of ESG performance (ESG) is 4.13 and the median is 4, with a mean value greater than the median, indicating that the ESG ratings of the sample companies are right-skewed distribution, and also the minimum value is 1 and the maximum value is 6, indicating that there is a large difference in ESG performance between the samples, and even some companies are rated at CCC level.

Table 1. Variable definition and description

Variables	Variable Symbols	Variable Definition
Audit Fees	Lnfee	Audit fees are taken as the natural logarithm
ESG Performance	ESG	Assign values from 1 to 9 in descending order
Earnings Volatility	Risk	(Ebitda/total assets) Three-year volatility
Corporate reputation	Rep	Factor analysis-based measures
Enterprise size	Size	Natural logarithm of the company's total assets at the end of the year
Enterprise Age	Age	Number of years the company has been listed
Gearing ratio	Lev	Total liabilities / Total assets
Corporate Growth	Growth	Growth rate of main business revenue
Tobinq	Tobinq	Enterprise Market Value / Asset Replacement Cost
Total Asset Turnover	Ato	Operating income / average total assets
Cash Flow Ratio	Cashflow	Net cash flow from operating activities divided by total assets
Book-to-market ratio	Bm	Book value / total market value
Ratio of independent directors	Indep	Percentage of independent directors
Board Size	Board	Number of Board of Directors
Separation of powers	Dual	Chairman and General Manager concurrently
Shareholding of the largest shareholder	Top1	Number of shares held by the largest shareholder / total number of shares
Whether state-owned enterprises	Soe	State-controlled enterprises take the value of 1, others are 0
Industry	Indcd	Industry dummy variables
Year	Year	Annual dummy variables, based on 2010

Table 2. Descriptive statistics of regression variables

	Sample size	Mean	Median	Minimum	Maximum
Lnfee	26051	13.77	13.66	12.54	16.21
ESG1	26051	4.130	4	1	6
Size	26051	22.14	21.96	19.95	26.08
Lev	26051	0.415	0.406	0.0497	0.884
Growth	26051	0.165	0.107	-0.539	2.309
TobinQ	26051	2.024	1.620	0.866	8.144
Age	26051	2.858	2.890	1.792	3.497
Ato	26051	0.657	0.558	0.0848	2.592
Cashflow	26051	0.048	0.047	-0.152	0.234
Bm	26051	0.999	0.637	0.092	6.649
Board	26051	2.130	2.197	1.609	2.708
Indep	26051	0.375	0.333	0.333	0.571
Dual	26051	0.282	0	0	1
Top1	26051	0.346	0.326	0.088	0.746

4.2. Multiple regression results

Table 3 presents the OLS regression results of the dividend payment model. Column (1) shows the relationship between ESG performance and the level of corporate audit fees, from which it can be seen that the relationship between ESG performance and corporate audit fees is significantly negative at the 1% level, indicating that the better the ESG performance, the lower the corresponding audit fees incurred by the firms, and hypothesis 1 is verified. Columns (2) and (3) show the effect of ESG performance on corporate audit fees after differentiating the nature of corporate ownership, and it can be seen that the relationship between ESG performance and audit fees is significantly negative at the 1% level in non-state-owned enterprises, while the effect is not significant in state-owned enterprises, although they also show a negative relationship. This indicates that the negative effect of ESG on

audit fees is stronger in non-SOEs compared to SOEs.

Table 3. Multiple regression results

	(1)	(2)	(3)
	Lnfee	State-owned	Non-State-owned
ESG1	-0.019*** (-7.52)	-0.006 (-1.18)	-0.027*** (-9.67)
Size	0.419*** (130.85)	0.484*** (81.86)	0.386*** (99.94)
Lev	0.015 (0.84)	-0.126*** (-3.79)	0.171*** (8.46)
Growth	-0.048*** (-6.74)	-0.072*** (-5.10)	-0.039*** (-4.85)
TobinQ	0.023*** (9.06)	0.041*** (7.34)	0.014*** (4.91)
Age	0.007	0.020	0.030***

	(0.79)	(1.02)	(3.08)
Ato	0.131***	0.164***	0.092***
	(19.14)	(13.77)	(11.27)
Cashflow	-0.047	-0.194**	0.035
	(-1.14)	(-2.46)	(0.75)
Bm	-0.003	0.006	-0.036***
	(-0.93)	(1.05)	(-6.16)
Board	-0.011	-0.024	0.014
	(-0.65)	(-0.81)	(0.68)
Indep	0.201***	0.077	0.180**
	(3.41)	(0.76)	(2.50)
Dual	0.038***	0.033**	0.018***
	(6.37)	(1.97)	(2.87)
Top1	-0.075***	-0.202***	0.005
	(-4.04)	(-5.63)	(0.24)
Constant	4.145***	2.830***	4.767***
	(50.79)	(18.84)	(46.29)
Observations	26,051	8,955	17,096
R-squared	0.635	0.668	0.599
Ind	YES	YES	YES
Year	YES	YES	YES

Note: Values in round brackets are two-tailed t-statistic values, *, **, *** denote statistically significant at 10%, 5%, and 1%, respectively, as follows.

Table 4. Replacement indicators and lagged one-period robustness tests

	(1)	(2)	(3)	(5)	(6)	(7)
ESG	-0.020***	-0.006	-0.029***	-0.014***	-0.005	-0.021***
	(-6.98)	(-1.05)	(-9.28)	(-5.01)	(-0.95)	(-6.69)
Size	0.419***	0.484***	0.386***	0.420***	0.485***	0.388***
	(130.55)	(81.29)	(99.83)	(120.34)	(75.80)	(92.42)
Lev	0.015	-0.125***	0.170***	0.074***	-0.107***	0.229***
	(0.87)	(-3.77)	(8.43)	(3.84)	(-2.91)	(10.26)
Growth	-0.048***	-0.072***	-0.039***	-0.058***	-0.091***	-0.044***
	(-6.74)	(-5.10)	(-4.87)	(-7.08)	(-5.56)	(-4.96)
TobinQ	0.023***	0.041***	0.014***	0.022***	0.039***	0.012***
	(9.06)	(7.34)	(4.90)	(7.80)	(6.21)	(4.03)
Age	0.007	0.020	0.029***	0.025**	0.059***	0.038***
	(0.74)	(1.01)	(3.01)	(2.50)	(2.64)	(3.50)
Ato	0.131***	0.164***	0.092***	0.129***	0.168***	0.086***
	(19.11)	(13.76)	(11.26)	(16.87)	(12.92)	(9.26)
Cashflow	-0.047	-0.194**	0.036	-0.023	-0.164*	0.037
	(-1.14)	(-2.46)	(0.77)	(-0.49)	(-1.88)	(0.71)
Bm	-0.003	0.006	-0.035***	-0.009**	0.004	-0.041***
	(-0.90)	(1.05)	(-6.08)	(-2.22)	(0.62)	(-6.78)
Board	-0.011	-0.024	0.014	-0.026	-0.019	-0.003
	(-0.67)	(-0.81)	(0.67)	(-1.39)	(-0.59)	(-0.14)
Indep	0.200***	0.076	0.181**	0.136**	-0.013	0.142*
	(3.39)	(0.75)	(2.51)	(2.12)	(-0.12)	(1.80)
Dual	0.038***	0.033**	0.018***	0.038***	0.038**	0.016**
	(6.38)	(1.96)	(2.87)	(5.75)	(2.10)	(2.36)
Top1	-0.075***	-0.202***	0.006	-0.094***	-0.217***	-0.003
	(-4.06)	(-5.64)	(0.27)	(-4.60)	(-5.55)	(-0.11)
Constant	4.151***	2.832***	4.776***	4.145***	2.796***	4.763***
	(50.88)	(18.84)	(46.37)	(46.61)	(17.17)	(42.41)
Observations	26,051	8,955	17,096	21,239	7,426	13,813
R-squared	0.634	0.668	0.598	0.633	0.661	0.603
Ind	YES	YES	YES	YES	YES	YES
Year	YES	YES	YES	YES	YES	YES

5.3. Propensity score matching (PSM) test

In order to overcome the "selectivity bias" of the different initial conditions of ESG performance and reduce the bias of the observed data, this paper conducts a propensity score matching (PSM) robustness test to distinguish the ESG ratings of enterprises according to the median, and distinguish

5. Robustness tests

5.1. Measures of replacement explanatory variables

In order to ensure the reliability and robustness of the research results, the variables measuring ESG performance are replaced in this paper, and the mean value of the four quarters within the year of China Securities ESG rating (ESG2) is used as a proxy variable for ESG. The regression results are shown in Table 4, and the test results are basically consistent with the previous paper, indicating that the previous findings are robust.

5.2. Robustness test for lagged one-period sample data

Considering that there may be a lagged effect due to the impact of ESG performance on the level of audit fees of companies, this paper uses the lagged one-period ESG performance in the robustness test to regress the main model, and it can be seen from Table 4 that the conclusions of this paper are still robust after considering the lagged effect of ESG performance.

them as greater than the median as 1, otherwise as 0. The results are consistent with the results of the main test in Table 5 (1)(2)(3), indicating that after controlling for possible endogeneity issues such as "selectivity bias", the suppressive effect of ESG performance on audit fees still exists, indicating that the conclusions of this paper are not affected by

systematic differences in the sample and are robust.

Table 5. PSM model robustness test

	(1)	(2)	(3)
	Lnfee	State-owned	Non-State-owned
ESG1	-0.017*** (-5.88)	-0.002 (-0.30)	-0.027*** (-8.15)
Size	0.417*** (109.43)	0.481*** (67.96)	0.386*** (84.43)
Lev	-0.040* (-1.88)	-0.223*** (-5.55)	0.138*** (5.55)
Growth	-0.042*** (-4.95)	-0.064*** (-3.79)	-0.036*** (-3.86)
TobinQ	0.013*** (4.27)	0.024*** (3.47)	0.009*** (2.60)
Age	0.010 (1.02)	0.048** (2.05)	0.021* (1.87)
Ato	0.129*** (16.14)	0.161*** (11.50)	0.094*** (9.75)
Cashflow	-0.009 (-0.19)	-0.066 (-0.70)	0.041 (0.75)
Bm	-0.004 (-0.89)	0.007 (1.04)	-0.032*** (-4.73)
Board	-0.030 (-1.52)	-0.017 (-0.49)	-0.009 (-0.39)
Indep	0.068 (0.98)	-0.073 (-0.60)	0.087 (1.03)
Dual	0.041*** (5.94)	0.037* (1.88)	0.019*** (2.72)
Top1	-0.071*** (-3.29)	-0.215*** (-5.08)	0.029 (1.14)
Constant	4.333*** (44.60)	2.958*** (16.45)	4.904*** (40.19)
Observations	18,759	6,266	12,493
R-squared	0.622	0.651	0.595
Ind	YES	YES	YES
Year	YES	YES	YES

6. Further Research

6.1. Mechanism of action test

Based on the previous theoretical analysis, this paper argues that ESG performance can curb the level of audit fees possibly by contributing to both reducing operational risk and improving corporate reputation. This section intends to test whether these two mediating effects exist.

Based on the study by Zhonglin Wen (2004) [19], the following model is set up in this paper to test the existence of the above three mediating effects:

$$\begin{aligned} Lnfee = & \alpha_0 + \alpha_1 ESG + \alpha_2 Size + \alpha_3 Age + \alpha_4 Lev + \alpha_5 Ato + \alpha_6 Growth \\ & + \alpha_7 Tobinq + \alpha_8 Bm + \alpha_9 Cashflow + \alpha_{10} Indep + \alpha_{11} Board \\ & + \alpha_{12} Dual + \alpha_{13} Top1 + \sum year + \sum indcd + \mu \end{aligned} \quad (2)$$

$$\begin{aligned} Channel = & \beta_0 + \beta_1 ESG + \beta_2 Size + \beta_3 Age + \beta_4 Lev + \beta_5 Ato + \beta_6 Growth \\ & + \beta_7 Tobinq + \beta_8 Bm + \beta_9 Cashflow + \beta_{10} Indep + \beta_{11} Board \\ & + \beta_{12} Dual + \beta_{13} Top1 + \sum year + \sum indcd + \mu \end{aligned} \quad (3)$$

$$\begin{aligned} Lnfee = & \delta_0 + \delta_1 ESG + \delta_2 Channel + \delta_3 Size + \delta_4 Age + \delta_5 Lev + \delta_6 Ato + \delta_7 Growth \\ & + \delta_8 Tobinq + \delta_9 Bm + \delta_{10} Cashflow + \delta_{11} Indep + \delta_{12} Board \\ & + \delta_{13} Dual + \delta_{14} Top1 + \sum year + \sum indcd + \mu \end{aligned} \quad (4)$$

First, the effect of ESG performance on corporate audit fees is examined without the inclusion of intermediate variables in model (2), and α_1 is observed; second, the effect of ESG performance on intermediate variables (Channel) is examined, and coefficient β_1 in model (3) is observed; again, the effect of ESG performance and intermediate variables on corporate

audit fees is analyzed simultaneously, and coefficients δ_1 and δ_2 in model (4) are observed.

6.1.1. Mediation effect test based on business risk

To test whether the mediating effect of operational risk between ESG and corporate audit fees is significant, the intermediate variables refer to the study of Wang Zhuquan et al. (2017) [16], which uses the volatility of earnings to measure the magnitude of operational risk, and the volatility of earnings (Risk) is calculated as:

$$\begin{aligned} \delta_{i,t} = & \sqrt{\frac{1}{T-1} \sum_{t=1}^T (E_{i,t} - \frac{1}{T} \sum_{t=1}^T E_{i,t})^2} \quad | T = 4 \\ E_{i,t} = & \frac{EBIT_{i,t}}{A_{i,t-1}} \end{aligned}$$

The full sample data are substituted into model (2), model (3) and model (4) for regression, and the regression results are shown in Table 6. The coefficient between ESG and audit fees in column (1) is significantly negatively correlated at the 1% level, indicating that the higher the level of ESG of an enterprise the lower its audit fees will be; the addition of mediating factors in columns (2) and (3) shows that the coefficient between ESG and enterprise business risk is significantly negatively correlated at the 1% level, indicating that the higher the level of ESG of an enterprise, the lower its business risk will be; after controlling for mediating variables, the After controlling for the mediating variables, ESG and audit fees are still significantly negatively correlated at the 1% level, which shows that the partial mediating effect of operational risk between ESG performance and corporate audit fees is significant, i.e., the better ESG performance of a company's internal governance structure is usually more standardized and the risk management system is more perfect, which makes the company more resilient in the face of external risks and effectively reduces the company's risk of financial distress and This reduces the risk of audit failure and thus reduces audit costs.

6.1.2. Mediation effect test based on corporate reputation

Companies with good ESG performance in the process of environmental information disclosure can send a signal to external stakeholders and the public that they are doing a good job, establish a good image of actively fulfilling social responsibility and protecting the environment, and help to enhance their corporate reputation, which makes auditors spend significantly less time and effort in the audit process, which manifests itself in fewer audit fees. On the other hand, reputable companies tend to actively disclose environmental responsibility information in order to maintain their reputation level from being damaged, thus reducing the information asymmetry inside and outside the company, allowing auditors to work in a more transparent environment, reducing the investment of audit resources and consequently reducing audit costs. Therefore, in order to test whether the mediating effect of corporate reputation between ESG and corporate audit fees is significant, this paper takes into account the evaluation of corporate reputation by various stakeholders and uses factor analysis to calculate the corporate reputation score, and the processing process of factor analysis is omitted due to the limitation of space.

In this paper, the regression results are shown in Table 6 by substituting the full sample data into model (2), model (3) and model (4). The coefficient of ESG in column (4) is significantly negatively correlated at the 1% level; the coefficient between ESG and corporate reputation in column (5) is significantly positively correlated at the 1% level, indicating that the better the ESG performance of a company

is, the better its reputation is; the coefficient of ESG in column (6) is significantly negatively correlated at the 1% level, while the coefficient of corporate reputation is significantly negatively correlated at the 1% level. It can be seen that the partial mediating effect of corporate reputation between ESG

performance and corporate audit fees is significant, i.e., the better the ESG performance the higher the corresponding reputation of the company, which reduces the cost of external audit and thus reduces the level of audit fees paid.

Table 6. Mechanism of action test

	(1)	(2)	(3)	(4)	(5)	(6)
	Lnfee	Risk	Lnfee	Lnfee	Rep	Lnfee
ESG	-0.019***	-0.008**	-0.019***	-0.019***	0.079***	-0.019***
	(-7.52)	(-2.27)	(-7.43)	(-7.52)	(5.24)	(-7.29)
Risk			0.014***			-0.008***
			(3.24)			(-7.28)
Size	0.419***	-0.005	0.418***	0.419***	1.424***	0.430***
	(130.85)	(-1.09)	(130.63)	(130.85)	(75.81)	(121.64)
Lev	0.015	0.045*	0.015	0.015	0.069	0.015
	(0.84)	(1.86)	(0.88)	(0.84)	(0.68)	(0.87)
Growth	-0.048***	0.036***	-0.049***	-0.048***	0.647***	-0.043***
	(-6.74)	(3.57)	(-6.82)	(-6.74)	(15.43)	(-6.02)
Age	0.007	0.016	0.006	0.023***	-0.007	0.023***
	(0.79)	(1.26)	(0.66)	(9.06)	(-0.46)	(9.04)
Ato	0.131***	-0.011	0.130***	0.007	0.186***	0.008
	(19.14)	(-1.15)	(19.08)	(0.79)	(3.57)	(0.95)
Cashflow	-0.047	-0.075	-0.047	0.131***	0.618***	0.136***
	(-1.14)	(-1.32)	(-1.15)	(19.14)	(15.40)	(19.76)
Bm	-0.003	-0.009*	-0.003	-0.047	2.923***	-0.024
	(-0.93)	(-1.69)	(-0.81)	(-1.14)	(12.13)	(-0.59)
Board	-0.011	-0.029	-0.012	-0.003	-0.492***	-0.007*
	(-0.65)	(-1.22)	(-0.68)	(-0.93)	(-22.98)	(-1.95)
Indep	0.201***	0.089	0.200***	-0.011	-0.190*	-0.012
	(3.41)	(1.08)	(3.39)	(-0.65)	(-1.91)	(-0.74)
Dual	0.038***	-0.005	0.038***	0.201***	-1.564***	0.189***
	(6.37)	(-0.60)	(6.31)	(3.41)	(-4.53)	(3.21)
Top1	-0.075***	-0.033	-0.074***	0.038***	-0.085**	0.037***
	(-4.04)	(-1.28)	(-4.04)	(6.37)	(-2.42)	(6.27)
Constant	4.145***	0.178	4.156***	-0.075***	-0.433***	-0.078***
	(50.79)	(1.57)	(50.91)	(-4.04)	(-4.00)	(-4.23)
Observations	26,051	26,040	26,040	4,145***	-28,111***	3,929***
R-squared	0.635	0.008	0.634	(50.79)	(-58.70)	(45.29)
Ind	YES	YES	YES	26,051	26,051	26,051
Year	YES	YES	YES	0.635	0.511	0.635

6.2. Heterogeneity Analysis

6.2.1. Whether the audit is a "Big Four" firm

Previous studies have shown that in addition to the internal characteristics of corporate governance that have an impact on audit fees, external factors such as the size of the audit firm or the attention of the auditor can also have an impact on audit fees. Compared to non-Big 4 firms, Big 4 firms are usually larger, which means that they have higher audit independence and more high-level and professional auditors, and therefore are able to perform high-quality audits, as demonstrated by their good reputation [20]. Therefore, in order to reduce the risk of audit failure and maintain their reputation, the "Big Four" firms usually show a strong risk awareness and high-quality audit level during the audit process, regardless of the ESG performance of the company, i.e., the higher information transparency resulting from better ESG performance does not have a significant impact on their audit behavior [21]. In this paper, the sample is divided into the "Big 4" group and the "non-Big 4" group according to whether the companies are audited by the "Big 4" or not. The regression results are shown in columns (1) and (2) of Table 7, which show that the effect of ESG performance on the reduction of audit fees is not significant among firms audited by "Big 4" firms; on the

contrary, the relationship between the two is significantly negative at the 1% level among "non-Big 4" firms. In contrast, the relationship between the two is significantly negative at the 1% level for non-Big 4 firms, further validating the above statement.

Table 7. Heterogeneity test

	(1)	(2)
	Big Four	Non-Big Four
ESG1	-0.009	-0.020***
	(-0.74)	(-8.29)
Size	0.499***	0.367***
	(39.20)	(112.77)
Lev	-0.084	0.099***
	(-0.88)	(5.96)
Growth	-0.054	-0.032***
	(-1.44)	(-4.64)
TobinQ	-0.019	0.013***
	(-1.46)	(5.43)
Age	-0.163***	0.032***
	(-4.09)	(3.68)
Ato	0.173***	0.115***
	(5.81)	(17.41)
Cashflow	-0.261	-0.090**
	(-1.22)	(-2.28)

Bm	-0.005 (-0.50)	-0.015*** (-4.08)
Board	-0.143** (-2.19)	-0.015 (-0.88)
Indep	-0.779*** (-3.29)	0.081 (1.42)
Dual	0.109*** (3.51)	0.031*** (5.39)
Top1	-0.644*** (-8.14)	-0.094*** (-5.24)
Constant	4.517*** (12.43)	5.253*** (63.95)
Observations	1,474	24,577
R-squared	0.735	0.589
Ind	YES	YES
Year	YES	YES

7. Conclusion and Insights

This paper investigates the relationship between ESG performance and audit fees based on the data of A-share listed companies in Shanghai and Shenzhen from 2010 to 2020. The results show that: (1) ESG performance and audit fees have a significant negative relationship, (2) the mechanism test confirms that it may be influenced by the mediating factors of business risk and corporate reputation; (3) after distinguishing whether companies are audited by the "Big Four" or not, the relationship is more significant among companies audited by the "non-Big Four" than those audited by the "Big Four".

The research in this paper gives us the following two important insights: (1) ESG, the act of fulfilling social responsibility, can not only gain the support of stakeholders for enterprises, but also reduce the level of corporate audit investment, so enterprises should actively take up social responsibility and realize the win-win situation of social and economic responsibility; (2) the findings of this paper reveal the inherent mechanism of ESG performance on the impact of corporate audit costs, so the investment of corporate audit costs can be reduced by improving the ESG rating of enterprises.

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