

The impact of ESG performance on audit fees - a study based on a two-way fixed effects model

Hongman Hou[#], Yawen Yang[#], Haolin Lv^{#, *}

Honors College, Tianjin Foreign Studies University, 300011, Tianjin, China

*Corresponding author: lvhaolin11@163.com

[#]These authors contributed equally.

Abstract. With the continuous promotion of the construction of beautiful China and ecological civilization, the concept of sustainable and green development has become increasingly popular. In recent years, enterprises' environmental social and governance (ESG) performance has received widespread attention in China. This paper selects panel data of A-share listed companies in Shanghai and Shenzhen from 2011 to 2020 and uses a two-way fixed-effects model to explore the relationship between ESG performance of listed companies and audit fees. Robustness and endogeneity tests of the empirical structure are performed by replacing explanatory variables and regressing explanatory variables with a one-period lag. The effect of firm heterogeneity characteristics on the relationship between the two is further examined through subsample regressions according to the nature of enterprises and audit institutions. We find a strong negative association between ESG performance and audit fees, meaning that better ESG performance of firms in China leads to lower audit fees. Also, it is tested that the negative effect of ESG performance on audit fees is more significant when the firm is a non-state owned firm and when audited by Big Four accounting firms. The empirical results of this paper will well enrich the study on the impact of ESG performance on firms and broaden the research on the factors influencing audit fees.

Keywords: ESG performance; two-way fixed effects; audit fees

1. Introduction

Since 2006, the United Nations Principles for Responsible Investment (UNPRI) has been promoting the incorporation of ESG principles in the decision-making process of major investment institutions. ESG ratings have gradually become one of the critical indicators for measuring the value of corporate investments and are widely used in investment decisions and risk management. According to data, the global ESG investment sale has reached USD 35.3 trillion by 2020, showing an accelerated expansion. In China, ESG is highly compatible with China's Five-sphere Integrated Plan and the vision of "innovative, coordinated, green, open, and shared development," providing a systematic and quantifiable operational framework for sustainable development and green development. In September 2018, the China Securities Regulatory Commission released the revised version of the Code on Governance of Listed Companies [1], which for the first time explicitly requires listed companies to disclose information about environmental, social, and governance. With the promotion of international forces from all walks of life, the ESG concept is deeply embedded in Chinese corporate development strategies, and now the investors are paying more and more attention to ESG ratings of companies.

Since the 1970s, there has been much academic literature in ESG-related fields. Scholars were the first to focus on the relationship between ESG performance and firm performance and firm value and have conducted many theoretical and empirical studies on this subject. Still, their findings have been widely controversial [2]. On the one hand, Fatemi et al. [3] found that ESG performance has a positive effect on firm performance measured by Tobin's Q. At the same time, ESG disclosure as a moderating variable significantly inhibits strong performance for firms that have ESG strengths. Kumar et al. [4] found that companies with better ESG responsibility performance send more positive signals to the outside world, which enhances corporate value. And significantly reduce the company's future financial and non-compliance risks. On the other hand, based on neoclassical and economic theories, some scholars argue that ESG investment has strong externalities and that corporate fulfillment of

environmental and social responsibility is perceived as over-investment by managers for personal reputation, which will not only fail to bring monetary benefits to the company but will also take resources away from the company's core technology development and innovation [5,6]. Therefore, there is a negative or unrelated relationship between corporate ESG performance and corporate performance.

Among the studies on the impact of ESG on corporate performance, most scholars have discussed the effects of media and corporate innovation in ESG disclosure. Yuan Yehu et al. [7] found that, based on reputation mechanism theory, a certain amount of media attention can enhance the contribution of good ESG performance to corporate performance, while excessive media attention may weaken it. From external pressure theory and stakeholder theory, scholars also found that either three respective dimensions of environmental, social, and governance or the total corporate ESG performance, can all significantly improve corporate performance, and there is a mediating effect among corporate innovation in ESG performance, three dimensions and corporate performance [8].

In summary, the existing literature on ESG performance has primarily focused on corporate performance, media monitoring, and corporate innovation. However, the internal mechanism of whether and how ESG performance affects audit fees needs to be further investigated. Given this, this paper selects the data of Chinese listed companies in Shanghai and Shenzhen A-share main boards from 2021 to 2020 and intends to explore the relationship between corporate ESG performance and audit fees by using corporate audit fees as the core explanatory variable. In addition, we further analyze the heterogeneous characteristics of the impact of ESG performance on audit fees by dividing the sample. This paper further explores the transmission path between ESG performance and audit fees by theoretically analyzing and empirical testing, which helps to enrich the research on the impact of ESG performance on firms and broadens the research perspective on the impact factors of audit fees.

2. Theoretical analysis and research hypothesis

ESG, which refers to environmental, social, and corporate governance, was first introduced in 2005 in a study called "Who Cares Wins." ESG is an extension and enrichment of the concept of green investment and responsible investment, and it is also an essential standard for the international community to measure the level of green and sustainable development of enterprises nowadays. ESG performance evaluation integrates environmental, social ethics, and governance performance into the corporate investment, decision-making, and evaluation system, a concept focusing on non-financial performance. Currently, the world ESG performance assessment is based on indicator construction and comprehensive scoring. More representative ESG assessment indices include MSCI ESG series indices (global/US/emerging markets), FTSE4Good2, SynTao Green Finance, China Securities SSI, etc., which provide reliable data analysis and support for ESG assessment and development.

2.1 ESG Performance and Audit Fees

The negative impact of corporate ESG performance on audit fees is manifested in the following ways: first, based on the information asymmetry perspective, good ESG performance implies an increase in the level of corporate information disclosure and a decrease in information asymmetry, which in turn reduces corporate information risk [9]. The higher quality information available to CPAs increases audit efficiency and reduces audit costs, which ultimately translates into lower audit fees [10]. Second, based on sustainability and stakeholder theories, companies with better ESG performance have higher compliance standards, more comprehensive risk management, and a higher degree of responsibility fulfillment at the societal level and are more likely to receive policy support [11]. It can effectively reduce friction with stakeholders and thus avoid legal risks in compliance with relevant laws and regulations. In addition, according to signaling theory, corporate ESG performance can send signals to the market. Existing studies show [4,12] that better ESG responsibility performance can send positive signals to the market, indicating that the company itself has lower

operational and financial risks. And legal risk, operational risk, and financial risk, as one of the inducing factors of audit risk, are positively correlated with audit risk. Since external auditors charge a higher audit risk premium to high-risk listed companies, i.e., the higher the risk of the firm, the higher the audit fee [13]. Therefore, good ESG performance of a company can reduce audit risk, which can effectively control the scope of audit work and the investment in audit procedures, thus reducing audit fees. Based on this, this paper proposes research hypothesis 1.

H1: The better the ESG performance of listed companies, the lower their audit fees.

2.2 ESG Performance and Non-Big Four Audit Fees

Based on the competitiveness evaluation theory, international Big Four accounting firms are considered to represent high-quality audits and are more favored by clients in the market, thus having strong competitiveness and bargaining power [14]. According to the previous analysis, it is clear that the better the ESG performance of a company, the lower the audit risk and cost. In this case, non-Big Four accounting firms with less competitive markets and lower bargaining power may charge lower audit fees to obtain business [15]. Thus corporate ESG performance may have a more significant impact on audit fees for firms audited by a non-Big Four. Accordingly, this paper proposes hypothesis 2a.

H2a: The negative effect of corporate ESG performance on audit fees is more significant for non-Big Four audits.

2.3 The differential impact of ESG performance on audit fees in state-owned and private enterprises

ESG performance has a heterogeneous impact on audit fees among different corporate entities, and this heterogeneity is more pronounced among state-owned and private enterprises. According to the two-factor-"health care-incentive" theory, SOEs belong to the health care factor. SOEs have an innate motivation to fulfill their social responsibility to support national policies, and stakeholders are accustomed to the ESG performance of SOEs [16], and their good ESG performance is in line with market expectations. Non-state-owned enterprises are incentive factors, and the market highly scrutinizes their ESG performance. Good ESG performance is more likely to convey good business conditions and lower risks for the company itself, which further reduces audit risks and audit costs. Combining the above analysis, this paper proposes hypothesis 2b.

H2b: The negative effect of ESG performance on audit fees is more significant for private firms than for SOEs.

3. Variable selection and model construction

3.1 Variable Selection

3.1.1 Explanatory variables: ESG performance

In this paper, we choose the ESG rating data of SSI to characterize the ESG performance of enterprises. SSI ESG ratings are used in conjunction with the Chinese domestic market to conduct an in-depth study of the distribution and structure of ratings, rating changes, and size and industry differences. It has the advantages of high update frequency, comprehensive coverage, and high data accessibility. The ESG rating is divided into 9 grades from excellent to poor "AAA-C," and the 9 grades from C to AAA are assigned as 1 to 9 in order, and the core index algorithm is continuously optimized, which is scientific and accurate and can genuinely and effectively reflect the ESG performance of enterprises.

3.1.2 Explained variables

Referring to the existing literature [17-18], the natural logarithm of current audit fees (lnFee) of listed firms is used as the explanatory variable in this paper.

3.1.3 Control variables

Considering the existence of other factors other than ESG performance that influence firms' audit fees, this paper refers to the studies of Gao [19] and Deng [20]. to control for the following variables. ①The governance structure of different companies can have a significant impact on corporate decisions and vary somewhat in their influence on corporate decisions, so this paper controls for the size of directors, measured by the number of board members taking the natural logarithm. ②Higher equity concentration can circumvent executives from acting against shareholder wealth and weaken the positive relationship between financial risk and audit pricing. Therefore, this paper controls the shareholding concentration by the number of shares held by the first most significant shareholder/total number of shares and controls the equity balances by the sum of the shareholding ratio of the second to fifth largest shareholder/the shareholding ratio of the first largest shareholder. ③Company size affects the financial operations of a company and influences the auditor's audit hours and resources; therefore, it positively affects the annual financial audit fee. Accordingly, the paper controls for firm size, as measured by the natural logarithm of the total annual assets of listed firms. ④Corporate surplus management will affect accounting soundness and the quality of accounting information and is one of the significant factors affecting annual financial audit fees. In this paper, we control for total asset turnover, measured as operating income/average total assets; and for return on assets, measured as net profit/average balance of shareholders' equity.

The variables selected for this paper are shown in Table 1.

Table 1. Variable description

Variable Type	Variable Name	Variable Symbols	Variable Definition
Explanatory variables	ESG Performance	<i>ESG_HZ</i>	Adopt SSI ESG index rating
Explained variables	Audit Fees	<i>lnfee</i>	Audit fees for public companies are taken as logarithms
Control variables	Company Size	<i>Size</i>	Natural logarithm of total annual assets of listed companies
	Return on Assets	<i>ROA</i>	Net income/average balance of shareholders' equity
	Total Assets Turnover	<i>ATO</i>	Operating income / average total assets
	Shareholding Concentration	<i>Top1</i>	Number of shares held by the most significant shareholder / total number of shares
	Equity Balance	<i>Balance</i>	Sum of the shareholding of the second to fifth largest shareholder/shareholding of the first largest shareholder
	Board Size	<i>Board</i>	The number of board members is taken as the natural logarithm.

3.2 Model Construction

The following model is constructed to investigate the impact of ESG performance of listed companies on audit fees.

$$\ln Fee_{i,t} = \beta_0 + \beta_1 \times ESG_HZ_{i,t} + \beta_2 \times Controls_{i,t} + \varepsilon_{i,t} + \mu_t + \eta_i \quad (1)$$

where β_0 is the intercept term; $\varepsilon_{i,t}$ represents a random disturbance term; μ_t and η_i denotes individual fixed effect and time fixed effect respectively; $Controls_{i,t}$ represents the control variables,

including Company Size (*Size*), Return on Assets (ROA), Total Assets Turnover (ATO), Shareholding Concentration (*Top1*), Equity Balance (*Balance*) and Board Size (*Board*); β_1 is the to-be-estimated parameter on which this paper mainly focuses. If it is negative and significant, it shows that there is a negative effect of corporate ESG performance on audit fees.

4. Result

4.1 Data Collection

This paper measures the impact of corporate ESG performance on audit fees using the panel data of listed A-share companies in Shanghai and Shenzhen from 2011 to 2020 as a sample. It excludes sample data according to the following criteria: (1) listed companies such as finance and insurance; (2) PT, ST, and *ST listed companies; (3) samples with missing audit fees and ESG ratings. For the missing data in the control variables, this paper uses the mean interpolation method to fill them in. In addition, to reduce the influence of extreme values on the regression results, this paper shrinks the tail before and after 1% of continuous variables. Finally, it obtains a total of 9,642 sample data. The data in this paper are obtained from CSMAR and Wind databases.

Descriptive statistics on relevant variables are shown in table 2.

Table 2. Descriptive statistics

VARIABLES	(1) N	(2) mean	(3) sd	(4) min	(5) max
<i>Size</i>	9,642	23.1100	1.3270	20.4700	26.9600
<i>ROA</i>	9,642	0.0477	0.0598	-0.1660	0.2360
<i>ATO</i>	9,642	0.6690	0.4650	0.0794	2.6110
<i>Board</i>	9,642	9.0250	1.8400	5.0000	15.0000
<i>Top1</i>	9,642	37.2200	16.0300	8.7900	77.0700
<i>Balance</i>	9,642	0.65400	0.5830	0.0237	2.6280
<i>ESG_HZ</i>	9,642	7.2190	1.1340	4.0000	9.0000
<i>lnFee</i>	9,642	14.1800	0.8070	12.7700	16.9700
<i>ESG_PB</i>	9,642	20.7300	6.8160	9.0910	44.6300

4.2 Baseline Regression Results

When estimating the panel data using Ordinary Least Squares (OLS), it is necessary to determine whether a random effects model or a fixed effects model should be applied. Accordingly, the Hausman Test is conducted, and the results of the Hausman Test are reported in Table 3: p-value < 0.01, which rejects the original hypothesis of the random-effects model. Therefore, for this panel data, the fixed-effects model is more suitable. Subsequently, it should consider whether the time effects exist in this model. So we add year dummy variables to the model and test the joint significance of all year dummy variables. The results are shown in Table 4: the p-value < 0.01, which firmly rejects the hypothesis of "no time effect" and hence considers that the model has a time effect. Therefore, a two-way fixed effects model was chosen to investigate the impact of ESG performance on audit fees.

Table 3. Hausman Test

Test: Original hypothesis: the disturbance term is not correlated with the explanatory variables
$\text{chi2}(7) = (b-B)'[(V_b - V_B)^{-1}](b-B)$
=56.97
Prob>chi2=0.0000

Table 4. Joint Significance Test of Year Dummy Variable

Test: Original hypothesis: no time effect in the model	
(1)year2=0	(6)year7=0
(2)year3=0	(7)year8=0
(3)year4=0	(8)year9=0
(4)year5=0	(9)year10=0
(5)year6=0	
F(16,8516)=731.46	Prob>F=0.0000

Table 5 reports the regression results for (1) mixed regression model, (2) fixed effects model, and (3) two-way fixed effects model. In model (3), the regression coefficient is -0.0134 and is significant at the 1% level, indicating that corporate ESG performance significantly reduces audit fees and hence validates research hypothesis H1. In audit practice, a good ESG performance indicates a higher level of corporate disclosure, further increasing information transparency so that CPAs can obtain sufficient and appropriate audit evidence at a lower cost. Meanwhile, excellent ESG performance may imply a reduction in business, financial, and legal risks. Furthermore, such a reduction may lower the incentive for management to engage in financial fraud and whitewash statements, thereby reducing audit risk. In addition, ESG performance can, to a certain extent, reflect the company's internal control. Better ESG performance may indicate more effective internal control, and higher quality of audit evidence obtained, leading to a reduction in the amount of audit evidence required and corresponding audit procedures to be performed. Therefore, companies should actively disclose ESG information and improve ESG management by practicing environmental policies, taking social responsibility, and ameliorating corporate governance. Through this, they can attain excellent ESG performance and thus reduce audit fees.

Table 5. Empirical Regression Results

	(1) lnFee	(2) lnFee	(3) lnFee
ESG_HZ	-0.0012 (-0.26)	-0.0101** (-2.96)	-0.0134*** (-4.08)
Size	0.4770*** (115.11)	0.4850*** (91.56)	0.3790*** (56.86)
ROA	-0.6100*** (-6.99)	-0.6780*** (-11.19)	-0.5150*** (-8.84)
ATO	0.1500*** (13.54)	-0.0062 (-0.45)	0.0390** (2.97)
Balance	0.1350*** (10.94)	0.0174 (1.55)	0.0325** (3.03)
Board	-0.0167*** (-5.92)	-0.0054* (-1.96)	0.0074** (2.77)
Top1	0.0016*** (3.46)	-0.0010 (-1.89)	0.0017*** (3.41)
_cons	3.1020*** (33.92)	3.1510*** (24.41)	5.121*** (34.29)
R ²	0.6240	0.5370	0.5790
N	9642	9642	9642

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

4.3 Robustness and Endogeneity Tests

The above study has confirmed that the better the ESG performance, the lower the audit fees. To further verify the reliability of the research results, this paper performs robustness tests by replacing the explanatory variables. Specifically, the ESG ratings published by Bloomberg are chosen to replace the SSI ESG. The results are shown in column (1) of Table 6: the regression coefficients are negative and significant and share the same direction of influence as in the previous section, indicating that the results of the empirical analysis are robust.

To test whether there is any endogeneity problem caused by reverse causality, the explanatory variables are regressed with a one-period lag in this paper. Column (2) of Table 6 reports the regression results for the lagged period, where the regression coefficients remain negative and less different from the previous paper, indicating that the results of the empirical analysis are robust.

Table 6. Robustness and Endogeneity Tests

	(1) Substitution variables	(2) One-period lag
	lnFee	lnFee
TAG	-0.0020** (-2.90)	-0.0109** (-3.24)
Size	0.3780*** (56.68)	0.3660*** (48.94)
ROA	-0.5150*** (-8.82)	-0.5620*** (-9.44)
ATO	0.0387** (2.94)	0.0436** (3.09)
Balance	0.0331** (3.09)	0.0192 (1.71)
Board	0.0073** (2.76)	0.0057* (2.09)
Top1	0.0018*** (3.55)	0.0012* (2.20)
_cons	5.0780*** (34.00)	5.5770*** (32.92)
R^2	0.5780	0.5020
N	9642	8455

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

4.4 Heterogeneity Analysis

This paper further analyzes the impact of firms' ESG performance on audit fees in different contexts, and the results are shown in Table 7.

Firstly, according to entities' accounting firms, the sample is divided into two groups: entities audited by Big Four and entities audited by non-Big Four. Columns (1) and (2) in Table 6 report the results after the subsample regressions. The regression coefficient of the non-Big Four audit group is -0.0149 and significant at the 1% level, denoting that the more significant the negative effect of ESG performance on audit fees when an entity's auditor is a Big Four CPA firm, verifying hypothesis H2a. Good ESG performance implies a reduction in audit risk. In this case, non-Big Four CPA firms, as market participants with lower competitiveness and bargaining power, may charge lower fees to obtain audit business.

Subsequently, this paper divides the sample enterprises into state-owned(SOEs) and non-state-owned(non-SOEs) enterprises according to their ownership. The results are shown in columns (3) and (4) in Table 6. It is found that the regression coefficients of non-SOEs are significantly negative. In contrast, the regression coefficients of SOEs are insignificant, indicating that the ESG performance

of non-SOEs exerts a more significant impact on audit fees, which verifies hypothesis H2b. The possible reason for this is that the good corporate image of SOEs has been deeply rooted, and thus CPAs do not believe that good ESG performance reflects a reduction in audit risk. Contrastly, due to the lack of administrative policy constraints, non-SOEs are likelier to have a disorganized internal governance structure and management's intention to commit fraud. With information asymmetry, when the ESG performance of non-SOEs is good, it is more likely to provide the market with favorable information within the enterprise. Therefore, CPAs may believe there is a lower audit risk for the enterprise.

Table 7. Heterogeneity Analysis Results

	(1)non-Big Four <i>lnFee</i>	(2)Big Four <i>lnFee</i>	(3)non-SOEs <i>lnFee</i>	(1)SOEs <i>lnFee</i>
ESG_HZ	-0.0149*** (-4.62)	0.0254 (1.87)	-0.0143** (-3.29)	-0.0040 (-0.81)
Size	0.3680*** (55.15)	0.3440*** (9.18)	0.3870*** (42.42)	0.3200*** (30.77)
ROA	-0.5040*** (-8.90)	-0.4790 (-1.62)	-0.6310*** (-8.59)	-0.2050* (-2.18)
ATO	0.0419*** (3.30)	-0.0450 (-0.65)	0.1230*** (6.46)	-0.0404* (-2.28)
Balance	0.0339** (3.22)	0.0882 (1.78)	0.0111 (0.78)	0.0703*** (4.11)
Board	0.0050 (1.82)	0.0040 (0.50)	0.0026 (0.62)	0.0054 (1.59)
Top1	0.0021*** (4.16)	0.0010 (0.47)	0.0024** (3.29)	0.0033*** (4.39)
_cons	5.2760*** (35.37)	6.5160*** (7.42)	4.9230*** (24.34)	6.3840*** (27.58)
R^2	0.6200	0.2390	0.6700	0.4780
N	8528	1114	4536	5106

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

5. Conclusion

Based on the panel data of A-share listed companies in Shanghai and Shenzhen from 2011 to 2020, this paper first explores the impact of corporate ESG performance on audit fees using a two-way fixed effects model. Then, it conducts the robustness and endogeneity tests by replacing and regressing the explanatory variables with a one-period lag, respectively. Finally, the impact of firm heterogeneity characteristics on the relationship between ESG performance and audit fees is further examined through sub-sample regressions.

The main findings of this paper are as follows:

- (1) the better the ESG performance of a firm, the lower the audit fee.
- (2) the negative effect of ESG performance on audit fees is more pronounced when the firm's auditor is a Big Four accounting firm.
- (3) the effect of ESG performance on audit fees is more evident for non-state-owned firms.

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