The Impact of Climate Information Disclosure on Audit Fees: A Study Based on Principal Component Analysis

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Abstract. To investigate the influence of corporate climate information disclosure on audit fees, this study examines the period from 2012 to 2021, focusing on companies listed on the Shanghai and Shenzhen stock exchanges. The research is based on the quasi-natural experiment of the ESG rating disclosure event by SynTao Green Finance in 2015. Firstly, using principal component analysis and a multi-period difference-in-differences model, the study determines the impact of climate information disclosure on audit fees. Robustness tests are conducted using trimming procedures and placebo experiments, which confirm the initial findings. Secondly, building on the previous analysis, the study explores the interaction effects of analyst forecast deviation and the presence of the Big Four audit firms on the relationship between ESG ratings and audit fees. Finally, the research concludes that the disclosure of climate risk information reduces audit fees by mitigating information risk and operational risk for companies. Moreover, this negative impact of climate risk disclosure on audit fees is more pronounced when analyst forecasts are more accurate or when the auditing firm belongs to the "Big Four" group.

Keywords: Climate risk disclosure, Audit fees, Audit risk, Analyst forecast deviation.

1. Introduction

Against the backdrop of carbon peak and carbon neutrality, the disclosure of climate-related information by corporations is gradually shifting from voluntary to mandatory requirements. In April 2022, the China Securities Regulatory Commission issued the "Guidelines for Investor Relations Management of Listed Companies," which includes ESG information as one of the communication contents between listed companies and investors. The risks that climate change brings to enterprises can be divided into two main categories: physical risks and transition risks (Liu Ruixia, 2021)[1]. Climate information disclosure is an important means for companies to assess and manage climate risks and meet the demands of external investors [2]. This study provides empirical evidence of the impact of climate information disclosure on audit fees. By examining the interaction effects between the Big Four accounting firms, analyst forecast deviation and climate information disclosure, the study enriches the literature on the impact of climate risk information disclosure on audit fees. Furthermore, it provides scientific evidence to demonstrate the influence of climate risk disclosure by listed companies on both the companies themselves and external information users.

2. Literature Review

Climate information disclosure is a crucial aspect of identifying, assessing, managing, and responding to climate risks within a company. It also serves as a primary means for external investors to evaluate a company's environmental and climate risk management practices. Institutional investors consider climate risks to have financial implications and regulatory risks for their investment portfolios (Krueger et al., 2020) [3]. Investors interpret climate information disclosure as a positive sign of a company's proactive approach to managing future cost risks and thoroughly assess its impact on the company's value before deciding whether to provide financial support. Climate information disclosure reduces information asymmetry regarding climate-related risks and enhances investor confidence[4].

Various channels are used by companies to disclose climate risk-related financial information, including annual reports, integrated reports, and sustainability reports. In this study, climate risk disclosure is primarily measured by whether Chinese-listed companies publish ESG ratings[5]. The choice is primarily driven by the fact that sustainability reporting is not currently mandatory in China, which means that many listed companies do not have corresponding sustainability reports, resulting in a smaller sample size[6]. In recent years, mainstream ESG rating agencies in China, such as Shangdao Ronglv and Wind, have also made some progress. However, different ESG rating agencies consider different weightings for different issues, have varying considerations for selecting underlying data indicators, and handle qualitative data differently, making it difficult to establish a unified, objective, and convincing standard. Currently, most studies focus on the impact of ESG ratings on a company's financing and profitability (Chang, 2023)[7], with little research on whether and how the disclosure of climate risks affects audit fees. Therefore, this study analyzes the issue from the perspectives of companies and auditing firms.

Audit fees are primarily determined by two factors (Bell, 2008)[8]: audit costs and audit risks. The more resources, time, and effort required to complete an audit, the higher the audit fees to compensate for the costs. Larger companies with a higher workload for evidence examination may also incur higher audit fees. Audit risks, on the other hand, are influenced by inherent risks, control risks, and detection risks. A company's information disclosure and operations can introduce information risks and operational risks, which in turn affect control risks, detection risks, audit risks, and audit fees[9]. Excessively high audit fees often draw external attention and are seen as potential issues with the quality of a company's financial statements, implying potential audit difficulties or financial opacity. This can raise concerns among investors and other stakeholders, leading to a decline in investor trust, shareholder withdrawal, or a drop in stock prices (Liu et al., 2019)[10].

The disclosure of climate risks prompts companies to proactively improve their management and information disclosure practices to meet specific policy requirements, reducing the company's information risk and subsequently decreasing audit fees. Auditors can obtain more high-quality information at a lower cost, effectively controlling the scope of audit work and the allocation of audit procedures[11], resulting in reduced audit fees.

Furthermore, after disclosing climate risks, companies, to enhance their ability to address climate risks, tend to focus more on their sustainability capabilities, thereby reducing their operational risks to some extent. This, in turn, leads to a reduction in audit fees. Moreover, companies with better climate information disclosure also send positive signals to the market and investors, indicating better prospects for development, lower capital costs, improved profitability, and financing capabilities, and increased company value. Consequently, future financial distress and risks of climate non-compliance are reduced to some extent, lowering the company's audit risk. As a result, audit firms employ fewer audit procedures and, subsequently, reduce audit fees [12].

3. Data Description & Preprocessing

3.1. Data Source and Analysis

This study focuses on the impact of climate risk disclosure on audit fees in Chinese-listed companies from 2012 to 2021. The sample selection process is as follows: Firstly, financial and insurance companies are excluded as they exhibit significant differences in their primary business, company size, and information disclosure compared to other listed companies. Secondly, ST-listed companies are excluded as they differ significantly from other companies in financial indicators, information disclosure, and audit fees. Thirdly, samples with missing data on audit fees, control variables, and other variables are excluded. ESG rating data, board size data, EPS forecast data, market value data, and the top ten shareholders' ownership data are obtained from the WIND database, while other data are sourced from the IFIND database.

3.2. Variable Definitions and Descriptive Statistical Analysis

3.2.1 Variable Definitions

AFEE is the dependent variable in this study, representing the audit fees paid by company i in period t+1. Considering the large difference in magnitude between audit fees and the independent and control variables, the natural logarithm of the fees paid to the auditing firm by the company is used as the specific indicator [13]. ESG is the main independent variable in this study. It is constructed based on the time when rating agencies publicly announce the specific ratings for listed companies, using a multi-period Difference-in-Differences (DID) dummy variable. Specifically, if a company i is rated by the rating agency in a specific period, the indicator is set to 1 for that year and subsequent years; otherwise, it is set to 0. Control includes all the control variables in this study, including company size (SIZE), leverage (LEV), return on assets (ROA), Tobin's Q (TOBINQ), board size (BSIZE), independent director ratio (INDEP), and whether the company engages one of the "Big Four" accounting firms (BIG4). Additionally, the study controls for fixed effects at the yearly (YEAR) and company (FIRM) levels. The definitions and values of all variables, including lagged values, are shown in Table 1.

Table 1. Variable definition.

Variables	
AFEE	Audit fees take the natural logarithm
ESG	When listed companies publish ESG ratings, the value is 1 for the current year and future years, otherwise it is 0
SIZE	Company size, equal to the natural logarithm of total assets
LEV	Asset-liability ratio, total liabilities divided by total assets
ROA	Return on assets, net profit divided by total assets
TOBINQ	Tobin's Q, equal to market capitalization divided by total assets
BSIZE	The size of the board of directors, and the total number of board members take the natural logarithm
INDEP	The proportion of independent directors, the number of independent directors divided by the total number of board members
BIG4	Whether the audit institution is a "big four" accounting firm, the value is 1, and the value is 0 if not
DEV	Analyst forecast bias, multiplied by the absolute value of the forecast error by -1 and divided by the stock price at the end of the year
FIRM	Company dummy variable
YEAR	Year dummy variable
IRISK	Information risk, by deriving manipulative accruals using the modified Jones model
ORISK	Operational risk, calculate the standard deviation of ROA through the earnings fluctuation of the current period and the previous and later period to reflect the operation situation

3.2.2 Descriptive Statistics

The maximum and minimum values of leverage are 0.894 and 0.053, respectively, with a standard deviation of 0.208, indicating significant variations in leverage among the sample companies. The maximum and minimum values of return on assets are 0.216 and -0.156, respectively, with a mean of 0.041. The mean value of the independent director ratio is 0.375, with maximum and minimum values of 0.571 and 0.333, respectively. The descriptive statistics of other control variables show reasonable distributions. The specific results of the descriptive statistical analysis for the dependent variable, independent variable, and control variables are presented in Table 2.

The statistical results for the selected sample in terms of the "Big Four" indicator show that the proportion of listed companies engaging one of the "Big Four" accounting firms is relatively small, with an average audit fee of 12.25, which is consistent with existing research findings. The mean value of ESG is 0.12, with a standard deviation of 0.33, indicating significant differences in climate risk disclosure among different companies. The standard deviation of company size is 1.22, with maximum and minimum values of 28.02 and 14.94, respectively, suggesting a wide range of company sizes in

the sample. The standard deviation of leverage is 1.16, indicating significant differences in leverage among the companies in the sample. The descriptive statistics of other selected control variables are reasonable.

Table 2. Descriptive statistics.

Variables	N	Mean.	Std	Min	Median	Max
BIG4	25770	0	0.0200	0	0	1
AFEE	25770	12.25	3.750	2.470	13.53	16.79
LEV	25770	0.420	1.160	0.0100	0.390	178.3
ROA	25770	0.0600	0.160	-8.890	0.0600	12.06
BSIZE	25770	2.120	0.190	0.690	2.200	2.830
INDEP	25770	0.370	0.0500	0.140	0.330	0.631
DEV	25770	0.0300	0.0900	0	0.0100	5.780
ESG	25770	0.120	0.330	0	0	1
SIZE	25770	22.05	1.220	14.94	21.91	28.02
TOBINQ	25770	2.470	7.210	0.0100	1.680	965

3.3. Mean and Median Differences in Variables between Climate Disclosure and Non-Disclosure Groups

Before conducting the empirical analysis, the mean and median differences in the dependent variable and control variables are examined between the sample groups categorized based on climate risk disclosure with or without ESG ratings. Panel A of the comparative table shows that the mean and median of audit fees in the sample group with ESG ratings are 11.85 and 14.12, slightly higher than the mean and median of 12.25 and 13.53 in the sample group without ESG ratings. There is a significant difference at the 0.01 level, which could be due to the fact that companies with ESG ratings are larger in size, and smaller companies require more cost for auditing work, resulting in higher fees. Panel B presents the mean and median differences of control variables between the two groups, and significant differences can be observed. It can be seen that in the group without ESG ratings, except for a smaller mean and median of Tobin Q compared to the ESG rating group, the mean and median values of variables such as leverage, return on assets, the board size, independent director ratio, top ten shareholder ownership ratio, company size, and whether they are "Big Four" accounting firms are all smaller than the mean and median values in the ESG rating group. This indicates that the financial strength and governance level of the ESG rating group is significantly better than the non-ESG rating group, further explaining the higher audit fees in the ESG rating group may be due to company size. The specific results of the mean and median differences in variables between the ESG disclosure and non-disclosure groups are presented in Table 3.

Table 3. Group comparison with and without ESG ratings.

	Disclosure			Non-Disclosure			Mean. std(T-test)	Median. std (Z-test)
Variables	N	Mean	Median	N	Ave.	Med.		
Panel A Dependent variable								
AFEE	25770	12.250	13.530	3115	12.850	14.120	0.451***	757.578***
Panel B Control variable								
LEV	25770	0.420	0.390	3115	0.470	0.470	-0.055***	295.129***
ROA	25770	0.060	0.060	3115	0.070	0.060	-0.008***	14.339***
BSIZE	25770	2.120	2.200	3115	2.180	2.200	-0.067***	615.425***
INDEP	25770	0.370	0.330	3115	0.380	0.360	-0.003***	47.655***
DEV	25770	0.030	0.010	3115	0.030	0.010	-0.008***	15.951***
SIZE	25770	22.050	21.91	3115	23.72	23.610	-1.894***	2184.338***
TOBINQ	25770	2.470	1.680	3115	1.930	1.120	0.612***	355.735***
BIG4	25770	0.061	0	3115	0.250	0	-0.201***	423.020***

Notes: The asterisks *, **, and *** denotes statistical significance at the 10%, 5%, and 1% level respectively.

4. Model Assumptions and Establishment

4.1. Data Source and Analysis

Companies with more comprehensive climate risk disclosure can better reduce the cost of auditing work, to some extent reducing a portion of the audit work. On the other hand, by voluntarily disclosing climate-related information, companies indicate their level of concern for climate risk and may take corresponding measures to mitigate physical and transitional risks. Climate risk disclosure can promote companies to improve the quality of information disclosure and internal governance. Furthermore, the disclosure of information risks caused by information asymmetry and additional disclosure of enterprise-related operational risks can reduce the audit risks faced by auditors. Therefore, auditors can employ fewer audit procedures, resulting in reduced audit fees. Based on these considerations, the following hypothesis is proposed:

H1: Companies that disclose climate risk in their annual reports have lower audit fees compared to companies that do not disclose climate risk.

In addition to company-specific characteristics, the size of the accounting firm can also influence audit fees. "Big Four" accounting firms, as internationally renowned firms, have stronger independence and a higher level of internationalization compared to non-"Big Four" accounting firms. They have been studying the quality of climate information disclosure earlier. Therefore, the "Big Four" firms can better ensure the quality of the company's climate risk disclosure information and recognize the impact of climate risk disclosure on audit risk, as well as the complementary effect of ESG information on audit work. Thus, the following hypothesis is proposed:

H2: The impact of climate risk disclosure on audit fees is more pronounced when the auditing firm is a "Big Four" firm.

Analysts, as information intermediaries in the market, analyze the data they obtain and the company's annual report and transmit it to investors, reducing information asymmetry. In particular, when analysts' profitability analysis quality is good, it indicates that the information transmitted by analysts as information intermediaries is of good quality. On the other hand, it also reflects that the company's information environment is good, with a lower degree of information asymmetry and smaller audit risk, resulting in lower audit fees. Registrants can assess the audit risk of client companies by analyzing the accuracy and dispersion of analysts' forecasts and then determine the audit fees (Shi et al., 2015) [14]. Climate risk disclosure the and high accuracy of analyst forecasts jointly validate the company's information environment. Therefore, the following hypothesis is proposed:

H3: When analyst forecasts are highly accurate, the negative impact of climate risk disclosure on audit fees is more pronounced for listed companies.

4.2. Model Establishment

To validate the impact of climate risk disclosure on audit fees, as proposed in Hypothesis 1, we construct Model (1) based on existing literature to test Hypothesis 1:

$$AFEE_{i,t+1} = \alpha_0 + \beta_1 ESG_{i,t} + \beta_2 Control_{i,t} + \beta_3 Year_{i,t} + \beta_4 Firm_{i,t} + \varepsilon_{i,t} \quad (1)$$

To examine the mechanism through which climate risk disclosure affects audit fees, we construct Models (2) and (3) to test the influencing mechanism:

$$IRISK_{i,t}(ORISK_{i,t}) = \alpha_0 + \beta_1 ESG_{i,t} + \beta_2 Control_{i,t} + \beta_3 Year_{i,t} + \beta_4 Firm_{i,t} + \varepsilon_{i,t} \quad (2)$$

$$AFEE_{i,t+1} = \alpha_0 + \beta_1 ESG_{i,t} + \beta_2 IRISK_{i,t}(ORISK_{i,t}) + \beta_3 Control_{i,t} + \beta_4 Year_{i,t} + \beta_5 Firm_{i,t} + \varepsilon_{i,t} \quad (3)$$

In Models (2) and (3), IRISK represents the information risk of the company. In this study, we use the modified Jones model to estimate discretionary accruals, where larger absolute values of discretionary accruals indicate greater information risk. ORISK represents the operational risk of the company, which reflects the risks associated with the company's operations. It is measured by the

standard deviation of return on assets (ROA) based on the volatility of earnings in the current period and the preceding and subsequent periods.

Furthermore, to examine the interaction effect between analyst forecast deviation and the "Big Four," we construct Model (4) to test the interaction effect:

$$AFEE_{i,t+1} = \alpha_0 + \beta_1 ESG_{i,t} + \beta_2 ESG_{i,t} INTER_{i,t} + \beta_3 Control_{i,t} + \beta_4 Year_{i,t} + \beta_5 Firm_{i,t} + \varepsilon_{i,t} \quad (4)$$

where INTER is the interaction term between analyst forecast deviation and whether the auditing firm is a "Big Four" accounting firm. The remaining control variables are the same as in Model (1). Accy represents the accuracy of analyst profit forecasts, calculated by taking the absolute value of the forecast error, multiplying it by -1, and dividing it by the stock price at the end of the current year. The calculation formula is shown in Model (5) as follows:

$$ACCY_{i,t} = (-1) \times |Forecast_{i,t} - Eps_{i,t}| / Shareprice_{i,t} \quad (5)$$

In Model (5), Forecast represents the median forecast of analysts for company i in period t, Esp represents the actual earnings of the company i in period t, and Shareprice represents the closing stock price of the company in period t.

4.3. Model Solving

4.3.1 Main Regression Model Analysis and Mechanism Analysis

In this study, panel regression is conducted to examine the impact of risk information disclosure on audit fees and its mechanism. Table 4 presents the results of the analysis of the mechanism of information risk and operational risk. According to the results in column (1) of Table 4, audit fees are significantly negatively correlated with ESG rating disclosure at the 0.01 level, with an ESG coefficient of -0.0483. The results confirm Hypothesis 1, indicating that ESG rating disclosure can reduce a company's audit fees. This suggests that the disclosure of ESG ratings by companies helps alleviate information asymmetry, effectively suppress earnings volatility, reduce audit risk, and consequently decrease audit fees.

To further investigate the mechanism through which ESG rating disclosure affects audit fees, this study refers to existing literature, which suggests that ESG rating of listed companies can reduce information risk and operational risk, leading to a decrease in audit fees (Shen Huayu et al., 2018) [15]. Columns (2) to (5) of Table 4 examine the mediating effects of information risk and operational risk. From the results of this study, it can be observed that in column (2), the ESG coefficient related to information risk is -0.0185, indicating a strong negative correlation. In column (3), after adding information risk, both the coefficients of IRISK and ESG remain highly negatively correlated, indicating that ESG rating disclosure can to some extent suppress earnings manipulation behaviors, reduce audit risk, and subsequently lower audit fees. In column (4), the ESG coefficient related to operational risk is -0.0041, and in column (5), after adding operational risk, both ORISK and ESG coefficients remain highly correlated, suggesting that ESG rating disclosure reduces a company's operational risk, and the decrease in earnings volatility reduces auditor's expenses, leading to a decrease in audit fees. The main regression analysis and mechanism analysis results are presented in Table 4.

Table 4. Main regression analysis and impact mechanism analysis.

Variables	(1) $AFEE_{t+1}$	(2) $IRISK_t$	(3) $AFEE_{t+1}$	(4) $ORISK_t$	(5) $AFEE_{t+1}$
ESG_t	-0.0483***	-0.0185***	-0.0481***	-0.0041***	-0.0475***
	(0.00847)	(-0.1318)	(0.00837)	(-0.3317)	(0.00807)
$IRISK_t$			0.0361*		
			(1.0293)		
$ORISK_t$					0.6741***
					(1.6135)
Con	Yes	Yes	Yes	Yes	Yes
Year and Firm	Yes	Yes	Yes	Yes	Yes
Constant	8.699***	-0.3340**	8.710***	0.0441	8.652***
	(0.108)	(-2.4694)	(0.128)	(1.3162)	(0.101)
N	26,937	26,937	26,937	26,937	26,937
R-squared	0.946	0.041	0.946	0.423	0.947

4.3.2 Interaction Effects of Analyst Forecast Bias and BIG4

In addition, this study further explores the impact of ESG rating on audit fees under different circumstances, such as analyst forecast bias and the presence of the BIG4 audit firms. The interaction effects of analyst forecast bias and BIG4 are presented in Table 5.

Column (1) examines the interaction effect of analyst forecast bias. The results show that as the analyst forecast bias increases, the negative impact of ESG rating disclosure on audit fees is weakened. Conversely, when analyst forecasts are more accurate, the negative impact of ESG rating on audit fees becomes more significant, confirming Hypothesis 3. Column (2) analyzes the interaction effect of BIG4. The results indicate that when the company's audit firm is a member of the BIG4, the negative impact of ESG rating disclosure on audit fees is more pronounced, validating Hypothesis 2.

These results suggest that there are moderating effects of analyst forecast bias and the presence of the BIG4 audit firms on the relationship between ESG rating disclosure and audit fees. The interaction effects of analyst forecast bias and BIG4 are presented in Table 5.

Table 5. Analyst Forecast Bias and BIG4 Interaction Effect.

Variables	(1) $AFEE_{t+1}$	(2) $AFEE_{t+1}$
ESG_t	-0.0361***	-0.0974***
	(0.00852)	(0.00843)
$ESG_t * DEV_t$	0.1080***	
	(0.0399)	
$ESG_t * BIG4_t$		-0.1106***
		(-1.2715)
Con	Yes	Yes
Year and Firm	Yes	Yes
Constant	8.914***	8.697***
	(0.113)	(0.107)
N	26,937	26,937
R-squared	0.946	0.941

4.4. Robustness Checks

(1) Winsorization Test:

Due to the large sample size in this study, a 1% winsorization method is used to remove extreme values that may affect the research. The regression is then conducted using the winsorized data. From Column (1) of Table 6, it can be observed that the coefficient of ESG rating on AFEE is -0.0677,

showing a significant negative correlation. This result indicates that the significant reduction in audit fees due to ESG rating disclosure is not caused by the influence of outliers. The robustness check results are presented in Table 6.

(2) Placebo Test:

To further demonstrate that the impact of ESG rating disclosure on audit fees is not influenced by other random factors, a placebo test is conducted. The original multi-period DID variable for ESG rating is redefined. It is assumed that the ESG rating was disclosed two years earlier, and the true impact of ESG rating disclosure on audit fees is reexamined. According to the results in Column (2) of Table 6, the coefficient of ESG rating for the two-year pre-period is no longer significant. This suggests that the disclosure of ESG rating indeed has a significant effect on reducing audit fees and is not influenced by other unobservable factors. The robustness checks results are shown in Table 6.

Table 6. Robustness test.

Variables	(1) $AFEE_{t+1}$	(2) $AFEE_{t+1}$
ESG_t	-0.0667***	
	(0.00763)	
ESG_{t+2}		0.0008
		(0.0726)
C	Yes	Yes
Year and Firm	Yes	Yes
N	22,736	26,937
R-squared	0.947	0.941

5. Conclusion

This study examines the impact of climate risk disclosure on audit fees, as well as the interaction effects of "Big 4" accounting firms and analyst forecast deviations on climate risk disclosure. The research contributes to the existing literature on climate risk disclosure and audit fees, providing scientific evidence for the effects of climate risk disclosure on listed companies and external information users. The results indicate that the disclosure of ESG ratings significantly reduces audit fees for listed companies. Further analysis reveals that ESG rating disclosure plays a role in external monitoring, reducing both information risk and operational risk for companies. As the inherent risk of a company decreases, audit fees are likely to be reduced. When analyst forecast deviations increase, the negative impact of ESG ratings on audit fees diminishes. Similarly, when companies choose "Big 4" accounting firms as their auditors, the negative impact of ESG ratings on audit fees becomes more significant.

The novelty of this study lies in the use of climate risk disclosure as the indicator, rather than specific rating levels. This approach effectively avoids the problem of varying indicators due to differences in underlying data and issue weighting by rating agencies. Additionally, the sample data is updated until 2021, expanding the sample range. For listed companies, it is advisable to actively disclose climate risk information and improve their ESG performance to reduce audit fees. Furthermore, there are complementary effects between climate risk disclosure and the choice of "Big 4" accounting firms as auditors, as well as analyst profit forecasts.

In conclusion, this study provides valuable insights into the relationship between climate risk disclosure and audit fees, as well as the moderating effects of the "Big 4" accounting firms and analyst forecast deviations.

References

[1] Liu, Ruixia. Global Practices in Climate Risk Disclosure [J]. China Finance, 2022(01): 86-88.

[2] Yadav Gopalan. The effects of ratings disclosure by bank regulators [J], Journal of Accounting and Economics, 2022, 73(1): 101438.

[3] Krueger, P., Z. Sautner, L.T. Starks. The Importance of Climate Risks for Institutional Investors [J]. The Review of Financial Studies, 2022, 33(3): 1067~1111.

[4] Sautner, Z., Van Lent, L., Vilkov, G., Zhang, R. Firm-Level Climate Change Exposure [J]. Journal of Finance, 2023(78): 1449-1498.

[5] Zhai, S. B., Cheng, Y. T., Xu, H. R., et al. Media attention and corporate ESG information disclosure quality. Accounting Research, 2022, (08): 59-71.

[6] Yi-Chun Chen, Mingyi Hung, Yongxiang Wang, The effect of mandatory CSR disclosure on firm profitability and social externalities: Evidence from China [J], Journal of Accounting and Economics, 2018, 65(1): 169-190.

[7] Kai Chang, Xiaochang Cheng, Yiran Wang, Qiming Liu, Jie Hu. The impacts of ESG performance and digital finance on corporate financing efficiency in China [J]. Applied Economics Letters, 2023, 30(4): 516-523.

[8] Bell, T.B., Doogar, R., Solomon, I. Audit Labor Usage and Fees under Business Risk Auditing [J]. Journal of Accounting Research, 2008, 46: 729-760.

[9] Xu-dong Ji, Wei Lu, Wen Qu, Internal control risk and audit fees: Evidence from China, Journal of Contemporary Accounting & Economics, Volume 14, Issue 3, 2018, Pages 266-287

[10] Liu, D., Zhao, X. & Xue, C. IPO Abnormal Audit Fees and Post-IPO Performance. Auditing Research, 2019, (04): 111-118.

[11] Xu, J., Xin, B., Xiong, Y. The value of mandatory certification: A real effects perspective [J]. Journal of Accounting Research, 2023, 61(1): 377-413.

[12] Ye, Fengying, Gong, M. N. Audit Fee Price Control and Audit Quality——Test Based on Double Difference Model [J]. Accounting Research, 2020 (12): 171-179.

[13] Liu, F., Zhou, F. Does the International Big Four mean high audit quality——A test based on the perspective of accounting conservatism [J]. Accounting Research, 2007, (03): 79-87+94.

[14] Shi, X. W., Li, Z. G., Liu, C. Research on Analyst Forecast and Audit Fees of Listed Companies——Based on the Perspective of Information Asymmetry Theory [J]. Journal of Audit & Economics, 2015, 30(03): 39~48.

[15] Shen, H.Y., Zhang J. & Yu Y. Executives' Academic Background, External Governance, and Audit Fees [J]. Audit Research, 2018(4): 86-94.