Will environmental information disclosure bring economic inflow to enterprises? — Based on the investigation of audit fees

Ping Chen

Beijing Jiaotong University, Haidian District, Beijing, China

Abstract. With the gradual deterioration of climate and environment, countries are becoming increasingly vigilant and repulsive to the economic development mode at the cost of energy consumption. It has become a new development trend to seek new alternative energy sources and pursue green and environment-friendly sustainable development mode. Environmental protection behaviors are generally considered to have positive external effects. This paper examines whether the environmental protection behaviors of A listed company have positive effects on the company based on the data related to environmental information disclosure from 2014 to 2017, and also examines the attitude of external supervision represented by independent auditing towards the company's environmental protection behaviors. It is enlightening to encourage listed companies to save energy and protect the environment.

1 Research background

With the development of the economy and the deterioration of the living environment, the problems of environmental pollution and energy consumption have increasingly become the concerns of the government and all sectors of society. Globally, economic growth at the cost of excessive energy consumption not only has serious negative externalities, but also is not sustainable for the country itself. Therefore, since the 20th century, the concept of sustainable development has been widely recognized by all countries. In 2010, the Ministry of Environmental Protection issued the Draft Guidelines on Environmental Information Disclosure of Listed Companies, which defined 16 industries including thermal power, steel, cement, electrolytic aluminum, coal, metallurgy, chemical industry, petrochemical industry, building materials, papermaking, brewing, pharmaceutical industry, fermentation, textile industry, leather making and mining as industries with heavy pollution. Listed companies designated as heavy polluting industries shall regularly disclose environmental protection information in respect of pollutant discharge and environmental management. Between 2010 and 2014, the central government's total investment in environmental pollution control increased by 25.8 percent. Investment in the treatment of industrial pollution sources increased by 151.4%. On January 1, 2015, the Environmental Protection Law of the People's Republic of China was formally and comprehensively implemented, stipulating strict disciplinary measures for enterprises that violate the law. Since then, the environmental damage behavior of energy-intensive and heavily polluting enterprises will not only cause negative externalities, but

also bring economic losses to themselves, and even be closed down.

The transformation from the extensive development model with high energy consumption to the sustainable development pattern is costly. As the increasing costs will put enterprises in a disadvantaged position in the fierce market competition, enterprises' environmental protection investment is often a passive choice to meet environmental protection requirements. Few companies can recognize the significance and value of environmental protection behavior for their own development.

Environmental audit, as a new field of environmental protection work, is also a new direction of audit work. Its purpose is to promote "environment-related economic activities" to meet the requirements of sustainable development through audit, which is a relatively mature external supervision method. From the perspective of audit fees, this paper tests the direct economic value of enterprises' energy conservation and environmental protection behaviors to themselves, and also verifies the attitude of external supervision represented by audit towards enterprises' environmental protection behaviors, which has certain enlightening significance for promoting enterprises' energy conservation and environmental protection.

2 Environmental protection and audit fees

2.1 Literature review

Because pollution control and environmental protection require huge economic costs as the price, it will have a certain impact on the performance of the company.

* Corresponding author: 1485922145@qq.com

Therefore, the disclosure of environmental responsibility information of listed companies will affect investors' decision-making, which constitutes the supervision department requires auditors to pay attention to corporate environmental information. Important reasons (Bowen, 1978). Some literatures have studied the relationship between independent audits and corporate environmental issues. Li Yuedong and Shu Jin (2011) surveyed the cement industry and found that the disclosure of environmental issues has no significant impact on the audit opinion of certified public accountants; while Han Lirong et al. (2013) Research found that companies with less disclosure of environmental information are more likely to receive non-standard audit opinions, and the more detailed the disclosure of environmental information, the higher the audit fee; Xue Dawei et al. (2018) used the 2012-2016 A-share energy industry listing As a sample, the company also found that the level of environmental information disclosure was positively correlated with audit costs and negatively correlated with the publication of non-standard audit opinions. However, some researchers have found that corporate social responsibility performance is positively related to audit fees: the better the corporate social responsibility performance, the lower the audit fees (Zhai Huayun et al., 2014; Zhu Min et al., 2015).

2.2 Theoretical analysis and research hypothesis

For audit fee, can be traced back to the American scholar Simunic (1980) of the audit fee model, the multiple linear regression method is used to study examines the assets of the auditees, auditing the annual profit for the previous two years, auditing the annual audit opinion type, firm size and the audit of term factors influence on audit fees, and points out that the audit cost and the risk premium is the audit fee of two factors. Since then, many scholars have conducted a lot of research on the factors that affect audit fees based on Simunic's model. The audit fee model has been continuously enriched and expanded, but it always follows the basic logic of audit investment and audit risk.

With the successive implementation of *The Environmental Protection Law of the People's Republic of China* and *The Environmental Protection Tax Law of the People's Republic of China*, the performance of enterprises in environmental protection will have a significant impact on their business risk and performance, and then have a certain impact on the audit input and audit risk (Wang Xindong, 2006). If an enterprise has irregularities in environmental protection, it will not only cause certain financial losses, but may even affect the ability of going concern, especially for enterprises with high pollution and high energy consumption, which further constitutes the basis for auditors to play a role in environmental audit. The degree of disclosure of environmental information will affect the risk of material misstatement in financial statements, and the degree of disclosure will also affect the audit investment. According to the theory of risk-oriented audit, the disclosure of

enterprise environmental information will have a certain impact on audit fees.

Due to the current business environment was still in the stage of voluntary information disclosure, according to the theory of signal, if the company voluntary disclosure of environmental information, are more likely to release positive signal to the market, that he's social responsibility in the field of environmental protection, a lower risk of violation of environmental laws and regulations, in order to win investor's favourite. At the same time, voluntary disclosure of more information reduces the cost of external auditors seeking audit evidence. Accordingly, this paper proposes the following hypothesis:

H1: Disclosure of environmental information will reduce audit fees.

3 Empirical analysis

3.1 Data source

Affected by the availability of data, this paper selects a-share listed companies that have disclosed social responsibility reports from 2014 to 2017 as the research samples, with A total of 66 industry segments and 2,794 firms-year data. All study data were obtained from THE CSMAR database. In order to reduce the influence of outliers on the empirical results, this paper performs a 1% Winsorize process on continuous variables. Data processing tools are Stata12.0 and Excel

3.2 Model design

To verify hypothesis 1, this paper builds the following model based on Simunic(1980) audit fee model:

$$\begin{aligned} \ln Fee = & \alpha + \beta_1 Environment + \beta_2 \ln Asset \\ & + \beta_3 Lev + \beta_4 Roe + \beta_5 Flex + \beta_6 Big4 + \beta_7 Loss \\ & + \sum Year + \sum Industry + \varepsilon \end{aligned} \quad (1)$$

The explanatory variable of this paper is audit fees, which is expressed by the natural logarithm of audit fees of listed companies in the current year. The explanatory variable is the disclosure of environmental information and sustainable development information of listed companies. If the company discloses environmental and sustainable development information in the current year, the value is 1; otherwise, the value is 0. This paper also controls the annual influence of the industry, and the specific definition is shown in Table 1.

Table 1. Variable definition.

Variables	Definition.
lnFee	The natural log of audit expenses for the annual financial report
environment	The disclosure of environmental protection and

	sustainable development is set as 1, otherwise 0
lnAsset	The log of total assets at the end of the period
lev	Asset-liability ratio
roe	Return on equity
flex	(Accounts receivable + inventory) / Assets
big4	If the firm is international big four, it is 1, otherwise is 0
loss	Net profit is negative is set as 1, otherwise is 0
age	(the sample year) – (the IPO year)
state	State-owned enterprises take 1, non-state-owned enterprises take 0
Industry	According to SFC classification standards
Year	2014-2017

3.3 Intergroup difference test

Firstly, this paper conducts an inter-group difference test based on whether environmental and sustainable development information is disclosed. The results are shown in Table 2. The second column in Table 2 is the average value of listed companies that did not disclose environmental and sustainable development information in the social responsibility report, and the third column is the average value of listed companies that disclosed environmental and sustainable development information in the social responsibility report. The last column is the difference between the two groups. According to Table 2, there is no obvious difference in audit fees between the disclosure group and non-disclosure group. Companies that do not disclose environmental information have smaller assets, lower asset-liability ratios, fewer listing years and hire fewer international "Big4".

Table 2. Mean difference between groups.

Variables	No-disclosure	Disclosure	MeanDiff
fee	14.24	14.23	0.01
size	22.72	23.19	-0.476***
lev	0.39	0.49	-0.100***
roe	0.08	0.07	0.01
flex	0.26	0.25	0.01
loss	0.03	0.07	-0.050**
age	12.91	14.10	-1.190**
big4	0.05	0.15	-0.096***
state	0.61	0.58	0.04

3.4 Multiple regression analysis

Next, this paper adopts OLS method to analyze the relationship between disclosure of environmental and sustainable development information and audit fees. The results are shown in Table 3. According to Table 3, environmental information disclosure is significantly negatively correlated with audit fees at 1%, indicating that the disclosure of environmental and sustainable development information is conducive to reducing audit fees, and external supervision represented by audit imposes economic penalties on behaviors that fail to disclose environmental and sustainable development information. It is consistent with the test results of hypothesis 1.

Table 3. Regression results

Variables	fee
environment	-0.189*** (-4.30)
size	0.446*** (41.79)
lev	0.0620 (0.90)
roe	-0.358*** (-3.16)
flex	-0.0311 (-0.44)
loss	-0.00766 (-0.17)
age	0.00440*** (2.69)
big4	0.527*** (17.12)
state	-0.0715*** (-3.53)
Industry	Yes
Year	Yes
_cons	3.991*** (15.50)
N	2794
adj. R ²	0.726

t statistics in parentheses;

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

3.5 Robustness test

In order to enhance the robustness of the research conclusion, this paper refers to the research methods of Li Buxi and Wang Pingxin (2006), and uses the audit fee rate (FeeRate) as a substitute variable for audit cost to conduct the robustness test. The regression results are shown in Table 4, according to Table 4, The regression results are consistent with the main test, indicating that the research conclusions have good robustness.

Table 4. Robustness test results

Variables	FeeRate
environment	-0.00844*** (-4.36)
size	-0.00746*** (-16.05)
lev	0.00322 (1.07)
roe1	-0.0146*** (-2.93)
flex	-0.00174 (-0.56)
loss	0.000204

	(0.10)
age	0.000197***
	(2.77)
big4	0.0222***
	(17.13)
state	-0.00313***
	(-3.55)
Industry	Yes
Year	Yes
_cons	0.792***
	(68.43)
<i>N</i>	2794
adj. <i>R</i> ²	0.347

4 Research conclusion

Energy conservation and environmental protection have increasingly become the focus of attention of all sectors of society. However, for enterprises, as a microeconomic subject, the economic burden brought by environmental protection will have a negative impact on their profits. Therefore, such environmental protection behavior with positive external effects is often a passive behavior that enterprises are reluctant to do. Using the data of A-share listed companies from 2014 to 2017, this paper empirically tests the impact of corporate environmental and sustainable development information disclosure on audit fees, and finds that disclosure of environmental and sustainable development information in corporate social responsibility reports will reduce audit fees. The environmental protection behaviors of enterprises not only have positive external effects, but also bring direct economic compensation to enterprises. This result verifies that the external supervision represented by audit pays attention to environmental issues, which is conducive to promoting the positive disclosure of environmental and sustainable development information by enterprises.

References

1. Ministry of Ecology and Environment, PRC official website:
<http://www.mee.gov.cn/xxgk2018/xxgk/xxgk15/201812/>
2. Han Lilong, Gao Yubin, SHENG Jin, etc. Are CPAs concerned about environmental issues? -- Empirical evidence from heavy pollution industries in Shanghai [D]. Editorial Department of Contemporary Accounting Review, Xiamen University (2013)
3. Xue Dawei, ZHANG Ning, WANG Jiashan, et al. Influence of Environmental Information Disclosure of Listed Companies in energy Industry on CPA Audit [J]. Journal of China University of Petroleum (Social Science edition), V.34 ; No.177(03):6-12(2018)
4. Simunic D A. The pricing of audit service: theory and evidence [J]. Journal of Accounting Research, (8):41-50(1980)
5. Li Buxi, Wang Pingxin. Characteristics of Board of Directors of Listed Companies and Audit Expense Ratio [J]. China Accounting Review, 004(001):105-118(2006)