

Research on the Regulation of Compulsory Disclosure of Environmental Information of Listed Companies in China under the Background of Green Finance Based on Computer Empirical Analysis

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Abstract. The development of green finance has put forward higher requirements for disclosure of environmental information of listed companies. The information environment of listed companies is the basis for cash flow. Enterprises should adapt to the development of the situation and continuously improve the completeness, accuracy, and standardization of information disclosure. However, the information environment disclosure of listed companies still faces problems such as endogenous and external pressure, limited information disclosure, and irregular information disclosure. The main reasons for these problems are the poor legal and administrative regulations for the disclosure of environmental economic information, the poor administrative regulations, and the lack of inspection and public supervision by the third party organizations. They are not the only ones for the disclosure of environmental information. Enterprises should pay more attention to the dissemination of environmental information. Based on the analysis of the existing problems, countermeasures and suggestions to improve the information environment disclosure of listed companies are proposed.

Keywords: green finance; Environmental accounting; Information disclosure; listed company.

1 Introduction

In the new situation of promoting the construction of saving money and protecting the environment in society in China, the development of green finance is a new development trend to promote green development[1]. Green finance is a macroeconomic policy that promotes energy conservation, emissions reduction, environment, capital flows, and sustainable economic development through innovation in green products such as green credit, green insurance, and green security, according to industry policies. In terms of green lending, green lending refers to policies that promote environmental protection, energy conservation, and emissions from lending. For projects and businesses that violate the laws and regulations of environmental protection, energy conservation, and mitigation, wealth such as prohibiting loans, extending loans, and even repayment of loans, may be limited to the extent possible,

and may be limited to the extent possible. The second is to use credit policies and means to promote environmental protection and energy efficiency and activities[2-3].

2 Present situation of environmental accounting information disclosure of listed companies in Province A

2.1 Number of listed companies with environmental accounting information disclosure

In 2018-2019, there were 56 and 55 listed companies in Province A, respectively. At the same time, according to the Ministry of Environmental Protection's "Regulations on Printing and Distributing the List of Key Pollutant Discharge Units" (Trial), there were 31 listed companies belonging to heavily polluting units in Province A in 2018, and 32 listed companies were listed as key pollutant discharge units in 2019. As shown in Table 1, the proportion of environmental information disclosures issued by listed State A companies in two years is 58.93% and 63.64%, respectively. Companies that publish environmental data are only concentrated in heavily polluted industries, with a reported rate of 100%. This is because since 2017, the government has been urging more polluting industries to publish environmental information, so all listed companies in the high pollution industry have begun to publish their environmental information later today. Because of the voluntary reporting system adopted by listed companies other than those involved in heavily polluted industries, the number of reporting systems was very low, with reporting rates between 8.00% and 8.57%, respectively [4].

Table 1. Overview of Environmental Information Disclosure of Listed Companies in Province A in 2018-2019.

industry	sample number		Disclosure quantity		Disclosure ratio	
	2018	2019	2018	2019	2018	2019
Disclosure time						
Heavy pollution industry	31	32	31	32	100%	100%
In which the mining industry	2	2	2	2	100%	100%
Food and beverage	3	4	3	4	100%	100%
Textile leather	1	1	1	1	100%	100%
Chemical	9	9	9	9	100%	100%
Pharmaceutical manufacturing	3	3	3	3	100%	100%
Instruments and equipment	3	3	3	3	100%	100%
Nonmetals and metals	5	5	5	5	100%	100%
Storage and transportation	2	2	2	2	100%	100%
energy	3	3	3	3	100%	100%
Non-heavy	25	23	2	3	8%	8.57%

pollution industry total	56	55	33	35	58.93%	63.64%
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2.2 The carrier of environmental accounting information disclosure of listed companies

In 2018-2019, the number of listed companies that disclosed environmental information in corporate annual reports was the largest, followed by companies that disclosed environmental information through social responsibility reports, while few listed companies disclosed environmental information through the preparation of sustainable development reports and annual environmental reports. As shown in Table 2. In 2018, 58.93% of enterprises disclosed environmental information in the annual report, and by 2019, it reached 63.64%. Corporate social responsibility report is also a common carrier to disclose environmental information. A total of 14 listed companies have published corporate social responsibility reports and disclosed environmental-related information in them [5].

Table 2. Environmental Information Disclosure Carriers of Listed Companies in Province A in 2018-2019.

Disclosure carrier	Total number of listed companies (units)		Total number of disclosure companies (units)		Disclosure ratio	
	2018	2019	2018	2019	2018	2019
Disclosure time annual report	56	55	33	35	58.93	63.64
Social responsibility report	56	55	14	14	25	25.45
Environmental report	56	55	0	0	0	0
Sustainable development report	56	55	1	0	1.79	0

2.3 Contents of environmental information disclosure of listed companies

As shown in Table 3, from the annual report of 2018-2019, the contents of environmental accounting information disclosure of listed companies in Province A are very scattered and distributed in various positions in the annual report. There are two main contents, one is quantitative information with a specific amount, such as environmental protection investment, taxes fees, and the other is qualitative information without a specific amount, such as environmental protection objectives and policies [6].

Table 3. Environmental Accounting Disclosure of Listed Companies in A Province in 2018-2019.

Disclosure project	sample number		Disclosure quantity		Disclosure ratio	
	2018	2019	2018	2019	2018	2019
Disclosure time Environmental protection investment	33	35	18	20	54.55%	57.14%

Pollution discharge	33	35	31	33	93.94%	94.29%
Environmental tax	33	35	33	35	100%	100%
Environmental objectives and policies	33	35	20	25	60.61%	71.43%
Environmental protection measures	33	35	33	35	100%	100%
Environmental protection achievements	33	35	22	25	66.67%	71.43%
Environmental protection research and development	33	35	six	six	18.18%	17.14%
Other environmental information	33	35	17	15	51.52%	42.86%
ISO environmental certification	33	35	6	6	18.18%	17.14%

The vast majority of enterprises have disclosed the relevant situation of pollution discharge, accounting for more than 90% of the total. Enterprises that publish corporate social responsibility reports will basically explain their environmental protection objectives, policies and achievements in the reports. Since the State promulgated the Environmental Protection Tax Law, all enterprises involved in pollutant discharge have paid environmental taxes on time and made centralized disclosure in the tax part of the annual report. In 2018-2019, the number of enterprises that disclosed environmental protection objectives and policies increased from 20 to 25, and the proportion increased from 60.61% to 71.43%. Environmental protection measures mainly include emergency plans for sudden environmental incidents, and environmental monitoring plans of enterprises themselves.

Considering the authoritative scholars in the field of heavy pollution enterprises, and the relevant government reports, policy documents, on the basis of the index selection on the enterprise's own green development level and the influence of financial performance, exploratory from green investment, green equipment, green credit, enterprise market value and sustainable development ability the five aspects to measure the green financial development level. The entropy method is used to determine the weight of the indicators affecting the development level of green finance. Specifically, the entropy method determines the weight of each index according to the size of the information provided by the value. The larger the gap in the value of an index, the greater the information provided by the index, so giving it a greater weight, while the weight of the index is smaller. The weight determination of entropy method is more objective than hierarchical analysis and principal component analysis. The specific calculation process of entropy method is as follows: Since the unit of measurement of each index is not unified, for n enterprises and m indexes, then the value of the j index of i

enterprises is $X_{ij} (i = 1, 2, \dots, n; j = 1, 2, \dots, m)$, These values are standardized first, and for convenience, these standardized data are recorded as Y_{ij} :

$$Y_{ij} = \frac{X_{ij} - \min(X_{1j}, \dots, X_{nj})}{\max(X_{1j}, \dots, X_{nj}) - \min(X_{1j}, \dots, X_{nj})} \quad (1)$$

Calculate the proportion of the i sample enterprise under item j index:

$$P_{ij} = Y_{ij} / \sum_{i=1}^n Y_{ij} \quad (2)$$

Calculate the entropy value of item j index:

$$E_j = -[\ln(n)]^{-1} \sum_{j=1}^n p_{ij} \ln p_{ij} \quad (3)$$

According to the entropy value, determine the weight of each index:

$$\omega_j = \frac{1 - E_j}{k - \sum_{j=1}^m E_j} \quad (4)$$

By multiplying the calculated weights by the value of each index, the development level of green finance (GF) can be obtained:

$$GF = \sum_{j=1}^m \omega_j \cdot p_{ij} \quad (5)$$

3 Problems and reasons of environmental accounting information disclosure of listed companies in A province

3.1 The main problems of environmental accounting information disclosure of listed companies in Province A

At present, the total disclosure rate of listed companies in State A is not high, and the disclosure is too high and there is no initiative. Because of the implementation of the partial and partial voluntary disclosure obligation, only the heavily polluted enterprises should disclose the environmental information, while non-polluting enterprises have to voluntarily disclose environmental information resources, which leads to lower rate of voluntary disclosure of environmental information by enterprises themselves. Under the influence of the state's non-mandatory disclosure and the fact that disclosure will increase the cost and workload of enterprises, many non-heavily polluting enterprises without mandatory disclosure requirements never take the initiative to disclose environmental information [7]. At present, the China Municipal Government has not issued a guiding document to explain the environmental information disclosure of listed companies.

3.2 Province A listed companies environmental accounting information disclosure problems caused by the main reasons

The state has mentioned environmental information disclosure in many documents related to the development of green finance and information disclosure of listed companies, but as far as the specific contents of the documents are concerned, most documents have not explained the specific requirements of environmental information disclosure. The government requires enterprises to publish the annual environmental report, but it does not require the specific content of the report, does not issue a unified template, establishes a unified standard, and has no mandatory institutional arrangement, which is one of the important reasons why no enterprises publish environmental reports [8]. From the cost point of view, the disclosure of environmental accounting information and environmental accounting by enterprises will inevitably bring cost increase and huge workload to enterprises. For enterprises that put interests first, this leads to the lack of enthusiasm of enterprises to disclose environment-related information. From the data analyzed before, it can be seen that for enterprises that have no mandatory disclosure requirements in the country, it can be said that the vast majority of enterprises have chosen not to disclose. On the other hand, the disclosure of environmental accounting information can also reflect the level of clean production and environmental protection of enterprises, as well as their technological innovation ability and improvement of production technology. Some enterprises lack the motivation to disclose environmental accounting information for the sake of short-term economic benefits [9-10].

4 Conclusion

The main body of enterprise internal control is the enterprise management at all levels. The purpose of its management is to protect the safety and integrity of the product market system, and to ensure the authenticity and reliability of the economic and financial information system. The method is to use the mutual restriction and connection established by dividing the unit functions, finally establishing the system, instrument, and system with the control functions. The internal control of an enterprise's environment is the management and evaluation of the behavior related to the enterprise and the environment. The sound internal control system can protect the legitimate rights and interests of enterprises, fulfill their social responsibilities, and ensure the authenticity and reliability of environmental information. Enterprises should fully recognize that the disclosure of environmental information is the key to the development of green finance. Doing a good job in disseminating environmental information and enhancing the transparency of the environmental information industry can promote the coordination of environmental protection and trade, and promote the development of ecological conservation and environmental protection.

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