

Research on Environmental Accounting Information Disclosure of Listed Companies in Gansu Province: Based on Multiple Linear Regression Model

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Abstract: In this paper, the environmental accounting information disclosure status of A-share list companies on Shanghai Stock Exchange and Shenzhen Stock Exchange in Gansu Province from 2017 to 2019 was analyzed. Then a multiple linear regression model for empirical research was established. The study results show that the enterprise size, operating capacity, social responsibility report preparation and media attention have notable influence on the environmental information disclosure of listed companies. Therefore, to facilitate environmental information disclosure of listed companies, it is essential to expand their size, optimize their operating capacity, prepare social responsibility reports, and enhance social supervision.

1 INTRODUCTION

The concept of “ecological civilization” was proposed at the first meeting of the 17th National Congress of the Communist Party of China (CPC) in 2007. Since then, the idea of environmental governance in China has continued to develop and improve. According to the fifth plenary session of the 19th Central Committee of the CPC held in 2020, green production and way of life should be vigorously advocated, and carbon emissions and total discharge of major pollutants should be reduced gradually, so as to continuously improve ecological environment quality and dramatically enhance the ecological security protection gradient.

To achieve the above-mentioned goals, enterprises need to disclose more environmental accounting information. Related research involves the influencing factors of disclosure, the characteristics of disclosure in different industries, and the features of disclosure in different regions. For instance, Wang R. (2021) investigated the relationship between the disclosure of environmental accounting information and financial constraints, she concluded that management governance could strengthen the correlation between the above two factors. Xu X.(2019) studied the influence and mechanism of green innovation

investment and non-monetary compensation of management on the interpretation of corporate environmental accounting information. Chen D.(2019) found that social responsibility notably increased the relevance between profitability and the disclosure quality of accounting information related to the environment. It was revealed by the study of Zhang Z.(2018) that political connections enhanced the impact of the disclosure quality of accounting data related to the environment on enterprise value. Li C.(2012) explored the relationship of environmental accounting information disclosure with regional economic disparity and enterprise organization changes.

The industries involved in the relevant studies include coal industry (Wang S. et al., 2018), air pollution industry (Li J., 2017), forestry (Liu M. et al., 2015), logistics industry (Mi Z., 2014), etc. Scholars have examined the disclosure of accounting data related to the environment of listed companies in such provinces as Yunnan Province (Liu K. et al., 2019), Hunan Province (Luo Q. et al., 2017), Sichuan Province (Liu J., 2016), Shandong Province (Wang J. et al., 2012), and Shaanxi Province (Wang X., 2011).

Taken above, current studies in China focus mainly on influencing factors and different industries. Regional research is rare, and research in Gansu Province is lacking.

Therefore, this research examined the environmental accounting data disclosure status of A-share list companies listed on the Shanghai Stock Exchange and the Shenzhen Stock Exchange in Gansu Province from 2017 to 2019. A multiple linear regression model was also developed for empirical study. This essay seeks to encourage listed companies in Gansu Province to disclose environmental data. The study's findings serve as a benchmark for enhancing China's environmental information disclosure standards.

2 HYPOTHESIS

The influencing factors studied in this paper are external and internal factors of enterprises. Internal factors include the company size, operating capacity and social responsibility report preparation. The external factor is media attention.

2.1 Company Size

The company size (SIZE) is an indicator of operating performance of the company. Companies with a large size are generally in the mature period of their life cycle. They have a relatively perfect operation and management mode, and are more inclined to disclose environmental accounting information to improve their image and attract investors. M.Vogt et al. (2017) analyzed the relationship of the size of 97 companies and environmental accounting information disclosure, the results suggested that the company size affected the disclosure of environmental accounting information. In this study, the company size is represented by total assets. A company with more total assets has a larger size, and receives more attention from the government and society. Enterprises with more total assets tend to disclose more enterprise information.

H1: The size of listed companies is positively related to the environmental accounting information disclosure level

2.2 Operating Capacity

The operating capacity (OC) reflects the utilization rate of various assets of the company. A high utilization rate implies that the company has high profitability, and can efficiently use its assets and quickly convert the assets into actual revenue. The company is able to implement environmental protection measures, so it is motivated to disclose more environmental accounting data to the outside

world. In the study of Wang X. et al. (2014), it was found that the operating capacity was intimately related to the environmental accounting data disclosure level. In this paper, the operating capacity is denoted by the total assets turnover ratio.

H2: The operating capacity of listed companies is positively related to the environmental accounting information disclosure level.

2.3 Social Responsibility Report

When an enterprise prepares a social responsibility report, the quality of its environmental data disclosure will be higher. X. Du (2018) analyzed related data of listed companies in the energy industry. The research results showed that the quality of environmental accounting data given by independent reports was better than that disclosed by the annual report of the company. Therefore, social responsibility report preparation (SRR) is chosen as one of the independent variables.

H3: Social responsibility report preparation of listed companies is positively correlated with the environmental accounting information disclosure level.

2.4 Media Attention

The more media attention a company receives, the more pressure it is under to disclose environmental data. The higher the quality of environmental information sharing, the more comprehensive the information disclosed by the enterprise. According to R. Gamerschlag et al. (2011), media attention influenced the level of information disclosed in environmental accounting. Hence, media attention (VISIBILITY) is taken as one of the independent variables.

H4: Media attention of listed companies is positively related to the environmental accounting information disclosure level.

3 RESEARCH DESIGN

3.1 Environmental Accounting Information Disclosure Index

The environmental accounting information disclosure level is reflected by environmental accounting information disclosure indexes (EDI) in this paper. After analyzing the collected data, it was found that a majority of the listed companies in Gansu Province disclosed environmental accounting information in

annual reports and social responsibility reports. All companies studied in this paper did not prepare social responsibility reports.

Based on the current situation of listed companies in Gansu Province, quantitative and qualitative

methods are used to score the companies tested in this paper according to indexes in Table 1. There are ten quantitative and qualitative indexes in the table, and the total score is 20 points.

Table 1: Environmental Accounting Information Disclosure Index.

Disclosed Item	Maximum score	Scoring rule
Key pollution monitoring unit	2 points	No description: 0 points; Description in words: 1 point; Description in words and quantity: 2 points; Highest score: 2 points.
Environmental protection measures achieve the goal stipulated in government policies	2 points	
Environmental management system or environmental protection concept	2 points	
Environmental protection honors or awards	2 points	
Environmental protection education and training	2 points	
Expenses for afforestation and sewage discharge	2 points	
Three wastes, energy conservation and emission reduction	2 points	
Pollution control	2 points	
Environmental protection input	2 points	
Environmental liability	2 points	

3.2 Sample Selection and Data Source

In this article, A-share listed companies on Shanghai Stock Exchange and Shenzhen Stock Exchange A shares in Gansu Province were taken as reference samples. After removing specially processed samples and samples with incomplete data, 26 companies were included, and their annual reports and social responsibility reports from 2017 to 2019 were studied.

All annual reports and social responsibility reports of the companies included were originated from official websites of Shanghai Stock Exchange and Shenzhen Stock Exchange. Total assets, total assets turnover ratio and other financial data of the companies were downloaded from CSMAR database. A part of media attention data came from China Securities Journal, the statutory disclosure newspaper designated by China Securities Regulatory

Commission for information disclosure of listed companies. The other part was from authoritative (financial) newspapers and periodicals (e.g., ShangHai Securities News and Securities Times) and manually collated network news. Data were processed by Excel and StataSE15.

3.3 Variables

Based on the above theoretical analysis, environmental information disclosure indexes of listed companies were taken as dependent variables. The company size, operating capacity, social responsibility report preparation and media attention were taken as independent variables. (Table 2)

Table 2: Variables Design.

Variable type	Variable symbol	Variable title	computing method	Expected symbol
Dependent variable	EDI	Environmental accounting information disclosure index	Scores of environmental information disclosure indexes	
Independent variables	SIZE	Company size	Total assets (taking the natural logarithm)	+
	OC	Operating capability	Total assets turnover ratio	+

SRR	Social responsibility report	1 for having released social responsibility reports; 0 for no social responsibility report	+
VISIBILITY	Media attention	The number of news about the included companies in securities publications and Internet news (taking the natural logarithm)	+

3.4 Model Construction

A multiple linear regression model was established to analyze the data:

$$EDI = a_0 + a_1SIZE + a_2OC + a_3SRR + a_4VISIBILITY + e$$

Where EDI denotes environmental accounting information disclosure indexes, a_0 is a constant term, a_1 - a_4 are regression coefficients, e is a constant error term, SIZE, OC, SRR, and VISIBILITY are independent variables.

4 EMPIRICAL RESULTS

4.1 Descriptive Statistics

In Table 3, the average value of Environmental Accounting Information Disclosure Index (EDI) is 0.201, the minimum value is 0, the maximum value is 0.55, and the standard deviation is 0.184. It can be seen that some companies did not disclose the situation. This indicates that the overall disclosure level of the companies in the sample is low.

Table 3: Descriptive Statistical Analysis.

Variables	N	mean	sd	min	max
EDI	78	0.201	0.184	0	0.550
SIZE	78	22.36	1.153	19.11	24.61
OC	78	0.483	0.316	0.063	1.337
SRR	78	0.192	0.397	0	1
VISIBILITY	78	5.189	0.960	2.833	7.880

4.2 Regression Analysis

The data in Table 4 are obtained by using multiple linear regression model, and the correlation coefficients of the four independent variables are all greater than 0. Therefore, it can be concluded that the

The data of SIZE is obtained by taking the natural logarithm of the total assets. The mean value of SIZE is 22.36, the minimum value is 19.11, the maximum value is 24.61 and the standard deviation is 1.15. It shows that the assets of the listed companies in Gansu Province are in good condition, the number of enterprises with large assets is more, and the scale of these enterprises is relatively stable, and the difference is small.

The value of OC in the table is the total asset turnover of the enterprise. The average value of total asset turnover is 0.483, the minimum value is 0.063, the maximum value is 1.337, and the standard deviation is 0.316. It shows that the operating capacity of listed companies in Gansu Province is different, and most of them are not high.

The maximum value of SRR is 1, the minimum value is 0, and the average value is 0.192, indicating that few companies in the sample prepare social responsibility reports.

The average of VISIBILITY is 5.189, the minimum is 2.833, the maximum is 7.88, and the standard deviation is 0.96. This indicates that almost all enterprises are concerned by the media.

four influencing factors of company size, operating capacity, social responsibility report preparation and media attention are positively correlated with the environmental accounting information disclosure index.

Table 4: Data from Regression Analysis.

EDI	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
SIZE	0.027	0.016	1.670	0.100	-0.005	0.059
OC	0.143	0.062	2.310	0.024	0.020	0.267
SRR	0.194	0.043	4.540	0.000	0.109	0.279
VISIBILITY	0.037	0.018	2.050	0.044	0.001	0.072

5 CONCLUSIONS

In this paper, 2017-2019 annual reports of 26 listed companies in Gansu Province are analyzed to figure out the current situation and influencing factors of their environmental information disclosure. The results reveal that all the 26 companies do not prepare environmental reports. Besides, less information is disclosed on environmental protection input, and qualitative descriptions are excessive. A larger company size, stronger operating capacity, social responsibility report preparation and higher media attention will promote the disclosure of more environmental accounting information.

Several measures can be taken to improve the disclosure quality of accounting data related to the environment of listed companies in Gansu Province. First, operation management of the company should be strengthened, especially the management of enterprise procurement, production and processing, sales and payment collection. Meanwhile, reasonable personnel and post allocation enables competent employees to undertake more important work. Second, listed companies should actively prepare social responsibility reports or environmental reports, and be conscious and willing to increase environmental awareness. Environmental information is generally disclosed through two ways: independent environmental reports and traditional financial reports. The latter way is commonly used in most listed companies in Gansu Province, but financial reports cannot highlight the importance of environmental data disclosure. Therefore, listed companies, no matter what types, should prepare social responsibility reports or environmental reports on environmental issues to fully explain the environmental accounting information. Third, accounting firms are encouraged to audit environmental reports and should be open to public and media scrutiny. Public opinion pressure will force enterprises to assume social responsibility for survival and development, and to cultivate the habit of disclosing environmental information. As a result, extensive environmental information disclosure will be carried out among enterprises.

REFERENCES

- Chen D., "Social responsibility, profitability and environmental accounting information disclosure," *Commun. Finance Account.*, no. 21, pp. 25–29, 2019.
- Kong D., Liu S., and Ying Q., "The role of media in corporate behavior: stirring up evil or boosting the flames?," *J. Manag. World*, no. 7, pp. 145–162, 2013.
- Li C., "Regional Economic Difference, Enterprise Organizational Change, Environmental Accounting Information Disclosure: Empirical Data from the Polluting Enterprises of Shanghai in 2009," *Audit Econ. Res.*, vol. 27, no. 1, pp. 68–78, 2012.
- Li J., "Environmental regulation, quality of environmental accounting information disclosure and market reaction -- Empirical Evidence from the air pollution industry," *Finance Account. Mon.*, no. 20, pp. 32–38, 2017.
- Liu M., Li Y., Wu Y., and Zhang C., "Research on environmental accounting information disclosure of Forestry Listed Companies in China," *Agric. Econ. Probl.*, vol. 36, no. 1, pp. 66-72+111, 2015.
- Liu K., Wu Y., and Mou S., "An empirical study on environmental accounting information disclosure of Listed Companies -- a case study of Yunnan Province," *Friends Account.*, no. 3, pp. 123–126, 2019.
- Liu J., "The Analysis of the Status Quo and Restraining Factors of Information Disclosure in Environmental Accounting of Listed Companies—Based on the Evidence of the Listed Companies in Sichuan Province," *Reform Econ. Syst.*, no. 4, pp. 121–126, 2016.
- Luo Q. and Zhang D., "Research on environmental accounting information disclosure of Listed Companies in heavy pollution industry -- a case study of Hunan Province," *Commun. Finance Account.*, no. 25, pp. 9–12, 2017.
- M. Vogt, N. Hein, F. Silva-da Rosa, and L. Degenhart, "Relationship between determinant factors of disclosure of information on environmental impacts of Brazilian companies," *Estud. Gerenciais*, vol. 33, no. 142, pp. 24–38, 2017.
- Mi Z. and Xie R., "Research on environmental accounting information disclosure of listed companies -- Based on the current situation of environmental accounting information disclosure in logistics industry," *Friends Account.*, no. 29, pp. 11–14, 2014.
- R. Gamerschlag, K. Möller, and F. Verbeeten, "Determinants of voluntary CSR disclosure: empirical

- evidence from Germany,” *Rev. Manag. Sci.*, vol. 5, no. 2, pp. 233–262, 2011.
- Wang R., “Management governance, environmental accounting information disclosure and financing constraints,” *Commun. Finance Account.*, no. 03, pp. 73–76, 2021.
- Wang S., Shang L., and Xi L., “Research on the problems and Countermeasures of environmental accounting information disclosure in Coal Enterprises,” *Friends Account.*, no. 9, pp. 48–52, 2018.
- Wang J., Kou J., and Zhang X., “Research on environmental accounting information disclosure in heavy pollution industry -- a case study of Listed Companies in Shandong Province,” *Friends Account.*, no. 31, pp. 107–109, 2012.
- Wang X., Wang H., and Li B., “A study on the effect domain of environmental accounting information disclosure of Listed Companies -- a case study of Listed Companies in Shaanxi Province,” *Mod. Econ. Sci.*, vol. 33, no. 4, pp. 115-123+128, 2011.
- Wang X., Wang H., and Luo J., “An empirical study on environmental accounting information disclosure of enterprises under Low-carbon Economy -- empirical data from the surveyed enterprises in Shaanxi Province,” *Commun. Finance Account.*, no. 24, pp. 13–16, 2014.
- X. Du, “A tale of two segmented markets in China: The informative value of corporate environmental information disclosure for foreign investors,” *Int. J. Account.*, vol. 53, no. 2, pp. 136–159, 2018.
- Xu X., “Management did not expect monetary compensation, green innovation investment and enterprise environmental accounting information disclosure,” *Commun. Finance Account.*, no. 27, pp. 48–52, 2019.
- Zhang Z., “Political Connection, Disclosure Quality of Environmental Accounting Information and Enterprise Value,” *Commun. Finance Account.*, no. 36, pp. 47–51, 2018.