

Value Effect of Environmental Information Disclosure in Listed Companies

Fu Minhang

Xueyuan South Road Haidian Beijing ,China

18811356399@163.com**Key words:** Enterprise Value; Environmental Information Disclosure; Corporate Governance

Abstract.It is difficult to balance economic development and environmental protection for a long time. As environmental degradation becomes more and more serious, human beings are increasingly aware that it is a wrong way to sacrifice the environment for economic development. In order to enable more enterprises to take the initiative to undertake environmental responsibilities, the Chinese government has introduced a series of laws and regulations. However, in the process of practice, there are still many problems which are extremely widespread, such as unstable and inconsistent disclosure content, low value of disclosure information.

This thesis makes research on the relationship between environmental information disclosure and enterprise value from two perspectives of theory and demonstration. At first, the system framework of the relationship between enterprise environmental information disclosure and enterprise value is constructed, and the value mechanism affecting environmental information disclosure is established.

Then, 54 typical listed companies from 17 subdivision industry from Shanghai and Shenzhen A-share listed companies which are heavily polluted are selected as samples. According to study data on financial report, social responsibility report, as well as sustainable development report, regression model is established to test the relationship between environmental information disclosure and corporate value, and the influence of corporate governance on the relationship between environmental information disclosure and enterprise value. What's more, the empirical proof demonstrates that the higher the level of enterprise environmental information disclosure, the higher the enterprise value; the higher the size of the board of directors and the proportion of the largest shareholders, the smaller the impact of the level of enterprise environmental information on enterprise value. Last but not least, this thesis puts forward some methods and suggestions for environmental information disclosure for government and enterprises.

1. Background

In the present era, rapid economic development causes increasingly prominent environmental problems. More and more people are aware that it is not enough to focus only on economic development. In the whole world, from Stockholm Conference to Rio de Janeiro Conference to Copenhagen Global Meteorological Conference, more and more countries have participated in the protection of the environment. We also increasingly feel that the awareness of environmental protection is permeating into our lives. People are no longer just pursuing economic development, or focusing on the value of enterprises and neglecting the protection of the environment, but are increasingly demanding for environmental information disclosure. According to the classical Environmental Kuznets Curve[1], there is an inverted U-shaped relationship between environmental pollution emissions and economic growth.

As a developing country, China is still difficult to reach a higher level when it comes to its economic status in the process of pursuing marketization and industrialization. However, industrial enterprises have already become the "main driving force" of environmental pollution. As an enterprise, it should actively disclose its environmental information, and take environmental protection as a social responsibility whether from a macro or micro perspective. Generally speaking, the industry and quantity of environmental information disclosure carried out by industrial enterprises in China are very low. In order to better urge enterprises to disclose environmental information, China has also promulgated many laws and regulations, such as Announcement on Enterprise Environmental Information Disclosure (2003), Measures for Environmental Information Disclosure (2007) and Guidelines for Environmental Information Disclosure in Listed Companies (2010). All these measures make our country's environmental information disclosure system more complete and standard, which also make more enterprises actively respond to environmental information disclosure.

2. Research Hypothesis

2.1 Research Hypothesis that Environmental Information Disclosure Affects Enterprise Value

2.1.1 Environmental Information Disclosure and Enterprise Value

Compared with the financial information of enterprises, environmental information disclosure has its own particularity, which is involved in some content that enterprises voluntarily disclose. Therefore, environmental information disclosure of enterprises would affect the value of enterprises.

Environmental information disclosure has influence on the cost of equity capital. From the investor's point of

view, the owner of equity encourages enterprises to disclose environmental information. If the environmental information disclosure for an enterprise is good, signal would be conveyed to outside that this enterprise attaches great importance to environmental protection and make reasonable and effective use of resources, which is conducive to the establishment of a good external image for an enterprise and attract more investors to invest in this enterprise. However, when an enterprise makes environmental disclosure, it would also attract the attention of the government, a large number of media and other sectors. Then, it may face some problems like negative reporting, which would affect the value of enterprise. From the enterprise's point of view, environmental information disclosure can help the external stakeholders and potential investors to better understand this enterprise, reduce the information asymmetry between two sides, enhance the mutual understanding of both sides, and reduce the capital cost of the enterprise. In conclusion, environmental information disclosure is beneficial to enterprise value.

Environmental information disclosure would affect the expected cash flow of enterprises in the future. Enterprises are willing to input human resources and material resources in environmental protection when disclosing environmental information, which shows that enterprises occupy strong market capacity, which is conducive to building a better public image and making more people prefer to choose enterprises with stronger environmental protection awareness, thus indirectly promoting the increase of business income and intangible assets of enterprises. Because of excellent environmental performance, enterprises are more likely to receive preferential policies and subsidies from the government, and less likely to be punished for environmental problems, which is conducive to reducing unnecessary expenditure. Based on above analysis, the following hypotheses are put forward:

H2-1: The higher the level of environmental disclosure, the more it is conducive to enhancing the value of enterprises.

2.1.2 Corporate Governance and Enterprise Value

Enterprises' internal governance and supervision mechanism has a great impact on its environmental information disclosure. The more reasonable the enterprise is in corporate governance, the more favorable it will be for the enterprise to have more ability to pay attention to environmental information disclosure. When enterprises are faced with some major environmental problems, they could respond in a better and positive way. Even though these problems do not happen, enterprises could better take precautions. Therefore, this shows that the scale of corporate

H2-2 The larger the size of board of directors, the smaller the impact of corporate environmental information disclosure on corporate value.

H 2-3 The larger the proportion of largest shareholders, the smaller the impact of environmental information disclosure on corporate value.

2.2 Research Design

2.2.1 Sample Selection and Data Source

The financial data in this thesis mainly come from CSMAR database. All samples in this chapter are A-share listed companies in heavy pollution industry in Shanghai and Shenzhen Stock Exchange from 2013 to 2015. (Because of the lack of data in the database in 2016 and 2017, it results in too few samples to select. Therefore, we can select more complete samples from 2013 to 2015 with more data.) Among the 16 highly polluted industries specified in the Guidelines for Environmental Information Disclosure in Listed Companies (2010) issued by the Ministry of Environmental Protection, this thesis mainly selects the following industries: non-ferrous metal smelting and calendering processing industry; metalworking industry, ferrous metal mining and processing industry, paper making industry and paper products industry, petroleum processing, coking and nuclear fuel processing industry, non-metallic mineral products industry, ferrous metal smelting and calendering industry, textile and apparel industry, chemical raw materials and chemical products manufacturing industry, coal mining and washing industry, rubber and plastic products industry, printing and recording media reproduction industry, non-ferrous metal industry Mining and dressing, oil and gas extraction, chemical fiber manufacturing, textile and leather, fur, feather and its products and footwear industries, all of which makes up 17 sub-industries. In the sample, all listed companies with ST and * ST and enterprises with missing individual variables were excluded. Finally, 57 typical listed companies are selected. This thesis adopts SPSS24.0 for analysis.

2.2.2 Model Construction and Variable Definition

$$TobinQ = \alpha_0 + \beta_1 EDI + \beta_2 Bsize + \beta_3 First + \beta_4 GR + \beta_5 Size + \beta_6 Lev + \beta_7 ROA + \varepsilon \quad (2-1)$$

In order to test the hypothesis H2-1, this thesis constructs a model (2-1) to verify the impact of environmental information disclosure on the value of enterprises. The specific model is as follows:

$$TobinQ = \alpha_0 + \beta_1 EDI + \beta_2 Bsize + \beta_3 First + \beta_4 GR + \beta_5 Size + \beta_6 Lev + \beta_7 ROA + \varepsilon \quad (2-1)$$

Among them, Tobin Q stands for enterprise value, which is measured by (price per share * number of circulating shares + net assets per share * number of non-circulating shares + book value of liabilities)/total assets. EDI is the level of enterprise's environmental information disclosure. According to the Chinese laws and regulations as well as the special national conditions in China, the following seven indicators which are concluded are used to measure the level of environmental information disclosure of enterprises. The first four indicators adopt 0-1 assignment method, and the last three indicators adopt 0-2 assignment method, with a total score of 10 points. At last, sum up all the scores of environmental information disclosure. In order to reduce the fluctuation of the value, $EDI = \frac{\text{the enterprise's environmental information disclosure score}}{\text{the highest environmental information disclosure score}}$, among which the environmental information disclosure index is controlled between 0 and 1. The larger the number is, the higher the level of environmental information disclosure is. Specific indicators are such as Table 2-1:

Table 2-1 Scoring Index of Environmental Information Disclosure

Serial Number	Disclosed content	scoring rules
1	Refer to GRI Guideline for Sustainable Development	1 with disclosure, 0 without disclosure
2	Environment and Sustainable Development	1 with disclosure, 0 without disclosure
3	Social Responsibility System Construction and Improvement Measures	1 with disclosure, 0 without disclosure
4	Deficiencies of the Enterprise	1 with disclosure, 0 without disclosure
5	Gas Emissions	2 with disclosure, 0 without disclosure
6	Amount of Resource Saving	2 with disclosure, 0 without disclosure
7	Cost on Environmental Protection	2with disclosure, 0 without disclosure

In terms of control variables, according to the research on the influencing factors of corporate value in the existing literature, the control variables in the model (2-1) are: size of board of directors (Bsize), first largest shareholder ownership ratio(First), equity structure(GR), company size(Size), asset-liability ratio (LEV)

and total net asset profit ratio (ROA) . In terms of explanatory variables, this thesis adopts the factors of the size of board of directors (Bsize) , first largest shareholder ownership ratio (First) and ownership structure (GR) to measure.

In the model (2-1), the regression intersection coefficient β_1 of EDI reflects the impact of environmental information disclosure level on corporate value. If the research hypothesis H2-1 is true, that is, the level of environmental information disclosure is positively correlated with corporate value, the regression coefficient β_1 should be significantly positive.

In order to further test the research hypotheses H2-2 and H2-3, this thesis introduces indicator of corporate governance mechanism to verify the relationship between corporate governance and enterprise environmental disclosure as well as corporate value. The regression intersection coefficient β_2 、 β_3 、 β_4 in model (2-1) measures the effect of corporate governance mechanism on corporate environmental information disclosure level and corporate value. If the regression coefficient of β_2 、 β_3 、 β_4 is significantly negative, it indicates that the more effective the governance mechanism is, the stronger the promotion effect of environmental information disclosure level on corporate value is, which further confirms the research hypotheses of H2-2 and H2-3. The definition of the main variables in model (2-1) is as follows:

Table 2-2 Variable Definition in the Model

Variable Type	Variable Name	Variable Symbol	Variable Definition
Explained Variable	Enterprise Value	Tobin Q	price per share * number of circulating shares + net assets per share * number of non-circulating shares + book value of liabilities)/total assets
Explanatory Variable	Level of Environmental Information Disclosure	EDI	Sum of standardized scores of quality and quantity of environmental information disclosure
	Size of Board of Directors	Bsize	Board's total Mmbership
	First Largest Shareholder Ownership Ratio	First	Number of shares held by the largest shareholder/total share capital
	Ownership Structure	GR	Number of shares held by the top five shareholders/total equity
Variable Type	Variable Name	Variable Symbol	Variable Definition
Control Variable	The company size	Size	Total assets
	Asset-liability ratio	Lev	Total liabilities/total assets
	Net profit margin on total assets	ROA	Net profit/average total assets

2.3 Empirical Results

2.3.1 Descriptive Statistics

From Table 2-3, it could be found that the average enterprise value of the sample companies (Tobin Q) is 0.91, the median is 0.67, the standard deviation is 0.62, the maximum value is 2.86, and the minimum value is 0.17. All results show that the difference of Tobin Q between enterprises is obvious. The mean value of environmental information disclosure index (EDI) is 0.36, the median is 0.33, the maximum value is 0.78, and the minimum value is 0.11. All findings demonstrate that the level of environmental information disclosure of enterprises is commonly low. The standard deviation is 0.23, which shows that the level of environmental information disclosure among enterprises is very small.

Table 2-3 Results of Descriptive Statistics

Variable	Observed Value	Average Value	Median	Standard Deviation	Maximum Value	Minimum Value
Tobin Q	57	0.91	0.67	0.62	2.86	0.17
EDI	57	0.36	0.33	0.23	0.78	0.11
Bsize	57	12.15	11.33	2.67	17.33	8.00
First	57	0.29	0.29	0.14	0.62	0.06
GR	57	0.54	0.52	0.17	0.91	0.06
Size	57	3.074E+10	1.876E+10	3.914E+10	2.298E+10	1.6514E+9
Lev	57	0.53	0.56	0.17	0.88	0.15
ROA	57	0.03	0.02	0.04	0.15	-0.03

2.3.2 Univariate Analysis

Table 2-4 Results of Univariate Analysis

	Tobin Q	Size	Lev	ROA	EDI
Tobin Q	1				
Size	-0.481**	1			
Lev	-0.737**	0.232	1		
ROA	0.551**	-0.108	-0.622**	1	
EDI	0.015	0.162	-0.061	0.045	1

** At 0.01 level, the correlation is significant.

Before regression analysis, correlation statistics were used to explain the interaction between variables. From the table, we can see that the correlation coefficient of Tobin Q and EDI is 0.015, which indicates that the relationship between environmental information disclosure level and enterprise value is positive, and preliminarily proves H2-1.

In the control variables, there is a significant negative correlation between company size (Size) and enterprise value (Tobin Q), which indicates that smaller companies have more potential and growth value than those that have developed relatively mature and stable. There is a significant negative correlation between capital structure (Lev) and enterprise value (Tobin Q), which shows that corporate liabilities play an important role in the development of enterprises. However, excessive corporate liabilities would lead to the increase of risks, which is not conducive to the development of enterprises. Therefore, enterprises should balance the advantages and risks of debts. In addition, there is a positive correlation between ROA and Tobin Q, which shows that the more wealth each yuan creates in the enterprises, the greater the enterprise value is. Enterprises should pay more attention to improving the utilization rate of assets and resources.

2.3.3 Multivariate Regression Analysis

Table 2-5 Results of Multivariate Regression Analysis

Variable	Regression Result
EDI	0.204
	0.046
Bsize	-0.182
	-0.043
First	-0.114
	-0.512
GR	-0.051
	-0.185
Size	-0.218
	-3.660E-12
Lev	-0.537
	-1.955
ROA	0.163
	2.552

(1)According to the above regression results, the regression result of environmental information disclosure index (EDI) in the simulation equation (2-1) is 0.204, which shows that the level of environmental information disclosure of enterprises is positively correlated with the value of enterprises. It confirms the previous hypothesis H2-1, that is, environmental information disclosure of enterprises, is conducive to enhancing the value and image of enterprises.

(2)Among the explanatory variables, the regression intersection coefficients of the size of board of directors

(Bsize) , the first largest shareholder ownership ratio First) and the ownership structure (GR) in the model (2-1) are negative, which verifies the two hypotheses of H2-2 and H2-3. The size of the board of directors, the proportion of the largest shareholders and the ownership structure reflect the corporate governance mechanism. Negative regression coefficient above shows that enterprises are more likely to disclose more valuable environmental information when the size of the board of directors is relatively small and the efficiency of the board of directors is relatively high, which is conducive to the growth of enterprise value.

(3)When the proportion of the largest shareholder of enterprises is relatively low and the ownership structure of the enterprise is relatively decentralized, the internal governance of the enterprise is more efficient and democratic, which is conducive to improving the level of environmental information disclosure, conveying more favorable information to the outside world, and encouraging more investors to participate in investment, which all benefits to enhance the value of the enterprise.

2.4 Result Analysis

At present, as the environmental information in China is mainly voluntarily disclosed by listed companies, this thesis makes such an assumption that there is a certain relationship between environmental information disclosure and enterprise value. Then in order to verify this hypothesis, this thesis adopts statistical analysis, correlation analysis and regression analysis, and introduces corporate governance mechanism to study its impact on the relationship between environmental information disclosure level and enterprise value. The main results are as follows:

(1)Enhancing the level of environmental information disclosure is conducive to conveying more favorable signals to the outside world. Establishing the image of environmental- friendly enterprises benefits to increase the expected cash flow of enterprises, and ultimately enhance enterprise value.

(2)Further research holds that corporate governance mechanism has an impact on the relationship between environmental information disclosure and corporate value. When the corporate governance mechanism is better, it will help enterprises to disclose more environmental information to the outside world and promote enterprise value; when the corporate governance mechanism is worse, enterprises would be faced with more environmental problems, and more likely to be confronted to negative events such as media exposure and government punishment, which makes enterprises establish an illegal image and more unfavorable to promote enterprise value.

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