

# Research on Internal and External Pressure Model of Environmental Information Disclosure Based on Legitimacy Theory

Yuxin Ning<sup>a,\*</sup>, Suyao Liu<sup>b</sup>

School of Economics and Management, Xi'an Shiyou University, Xi'an, Shaanxi, China

<sup>a</sup>1041526399@qq.com, <sup>b</sup>854811754@qq.com

\*Corresponding author

**Keywords:** internal governance, external pressure, environmental information disclosure, entropy method

**Abstract:** The disclosure and quality of environmental information play an important role in making sound decisions, while the disclosure of complete environmental information is affected by internal and external pressures. Based on the theory of legality, we construct an internal and external pressure model for the environmental information disclosure on pollution by listed companies. We measure the internal and external pressure of companies by using the entropy method with multiple regression analysis. The result shows that external pressure promotes the disclosure of corporate environmental information more than internal governance. It is suggested that the government, credit institutions, and the media play their supervisory role.

## 1. Introduction

China's economic achievements are inseparable from the strong support of industries causing heavy pollution. Companies overexploit natural resources and discharge waste gas and waste water. This poses a great threat to the environment. In addition, such companies conceal environmental information or only disclose positive environmental information not to be condemned by the public. Faced with this situation, China has promulgated the Environmental Protection Law, Air Pollution Law, and Safety Production Law but has not explicitly required companies to disclose their compliance. Thus, the Guidelines for the Disclosure of Environmental Information of Listed Companies and the Reform Plan for the Disclosure of Environmental Information According to Law were successively issued. Although companies must disclose environmental information under the law, there is still a lack of compulsion to a certain extent due to the imperfect legal system.

The lack of relevant laws and regulations and the lack of strict public supervision have become the reasons why listed companies do not disclose environmental information voluntarily and comprehensively. The incomplete information affects the stakeholders to make reasonable decisions. Therefore, we focus on this issue and explore the specific reasons for the information concealment. Several measures are proposed to promote companies to disclose environmental information actively and initiatively, too.

## 2. Literature Review and Research Hypothesis

### 2.1 Internal governance and company environmental information disclosure

Internal governance is a mechanism of encouragement, supervision, restriction, and balance between shareholders, board of directors, and management team. The internal governance of a company is usually affected by the supervision of the board of directors for the degree of equity checks and balances and the combination of the two. The board of directors has the fiduciary responsibility to supervise the management and ensure that management has the expertise and resources to make decisions for the sustainable development and the interest of stakeholders. Effective boards typically have a high proportion of independent directors<sup>[1]</sup>, a high degree of diversity of board members<sup>[2]</sup>, the voice of controlling shareholders<sup>[3]</sup>, and the integrity of the CEO<sup>[4]</sup>.

Equity checks and balances are the decisions that the major shareholders cannot control independently, and only, through internal checks and balances. The greater the degree of equity checks and balances, the less likely it is that major shareholders choose to withhold environmental information to maximize their interests<sup>[5]</sup>. The term "two-in-one" means that the chairman of the board is the same person as the general manager of a company. When the ownership and control of the company are owned by one person, the independence is weak, and the possibility of hiding environmental information is greater. Therefore, the separation of ownership and management rights has become one of the driving forces for the increase in the environmental information disclosure ratio<sup>[6]</sup>. Based on the above theory, hypothesis 1 is proposed.

H1: A good internal governance mechanism can improve the level of environmental information disclosure of listed companies in heavy pollution industries.

## **2.2 External pressures and corporate environmental disclosure**

The disclosure motivation of "public pressure" means that the pressure from the public, politics, and development are the main factors to force companies to disclose environmental information<sup>[7]</sup>. The media reflects public opinion, which influences the behavior of companies and the decision-making of stakeholders. Listed companies with high media attention are more likely to send a good signal to the outside for environmental disclosure<sup>[8]</sup>. The stronger the government's control and incentive on environmental protection, the more pressure or incentive companies have on environmental disclosure<sup>[9]</sup>. State-owned companies are more directly and strictly controlled by the government, so they disclose environmental information more actively and comprehensively<sup>[10]</sup>. Similarly, state subsidies facilitate the disclosure of environmental information by companies<sup>[11]</sup>. Under the current Green Credit policy background, listed companies can disclose environmental information in exchange for the favor of creditors. In China, as the main financing channel for companies, banks have certain policy-oriented restrictions. Therefore, to facilitate financing, companies voluntarily disclose relevant information about the environment to demonstrate corporate social responsibility. Based on the above theory, hypothesis 2 is proposed.

H2: Strong external pressure forces listed companies in heavily polluting industries to improve their environmental disclosure.

## **2.3 Internal governance, external pressure, and environmental information disclosure**

According to the legitimacy theory, society endows the company with the corresponding legal status, and the company obtains the "legitimacy" of the resource needed for survival and development. Furthermore, from the perspective of organizational legitimacy, a company with complete legitimacy must have both "internal legitimacy" and "external legitimacy"<sup>[12]</sup>. Internal legitimacy refers to the consistency of values in a company and internal personnel, such as the board of directors, management, and staff. External legitimacy refers to the external stakeholders (such as the government and related institutions, and the public) for the approval of the company. In the actual operation of a company, although a reasonable power structure has been established to ensure the convergence of values between the company and the internal personnel, managers most likely choose not to disclose information related to environmental investments for their interests and due to the absence of contractual constraints. However, there is an implicit contract between the company and the outside. Thus, the company in the heavy pollution industry wins the favor of the government, the creditor, and the public to obtain the right to use the environmental resources continuously. Disclosure of environmental information is one way to gain favor. This leads to hypothesis 3.

H3: External pressure has a significant positive impact on the level of environmental information disclosure than internal governance.

## **3. Research Design**

### **3.1 Sample selection**

Based on the criteria of the Ministry of Environmental Protection and the availability of

information of listed companies, the listed companies in the A-share sector of Shanghai and Shenzhen with heavy pollution were selected. To avoid the influence of outliers, companies with missing data are excluded. Finally, 264 listed companies in the heavy pollution industries for 5 years were selected for a total of 1320 observations.

### 3.2 Selection of variables and definitions

The variables selected for this article and their explanations are as follows (Table 1).

Table 1 Definition of variables and their indicators

Types	Secondary Index	Symbols	Tertiary index	Nature	Definition
Explained Variable	Level of environmental information disclosure	EDI			Values calculated from Table.2 and EDI formula
Explaining variable	Internal governance	InGov	Independent Director Proportion	Positive Index	Number of independent directors/total number of directors
			Equity interest Degree of checks and balances	Positive Index	Second to ninth largest shareholder total/first largest shareholder stake
			Two jobs in one Situation	Positive Index	Virtual variable, 0 if the two jobs are combined, or 1
	External pressure	ExPre	Media Degree of attention	Positive Index	LN (number of times reported Corporater Mediaedia + 1)
			Equity nature	Positive Index	The dummy variable is 0 for non-state-owned companies and 1 for state-owned companies
			Credit pressure	Positive Index	Total bank loans/liabilities
Control Variable	Asset size	SIZE			Ln (total company assets)
	Profitability	PRO			(revenue-operating costs)/operating costs

#### 3.2.1 Explanatory variable - environmental information disclosure level (EDI)

The Environmental Information Disclosure Index is important to measure the level of environmental information disclosure. Content analysis is commonly used to calculate the Environmental Information Disclosure Index. The Content analysis classifies the information in public documents or reports of listed companies, scores the subdivided items according to the company's performance, and then aggregates them for overall evaluation. Based on the Guide to Environmental Information Disclosure of listed companies, we evaluate the environmental information disclosure level of listed companies in the following dimensions. The specific rating contents are shown in Table 2.

Table 2 Environmental accounting disclosure index score

Disclosure Item	Entry	Scoring criteria
Disclosure carrier	Whether it was disclosed in the company's annual report	0 = No; 1 = Yes
	Whether it was disclosed in a social responsibility report	0 = No; 1 = Yes
	Whether to disclose the environmental report separately	0 = No; 1 = Yes
Contamination condition	Effluent discharge	0 = no description; 1 = qualitative description; 2 = Quantitative description
	Organic pollutant emissions	0 = no description; 1 = qualitative description; 2 = Quantitative description
	Soot and dust emissions	0 = no description; 1 = qualitative description; 2 = Quantitative description
	Industrial solid waste discharge	0 = no description; 1 = qualitative description; 2 = Quantitative description
Environmental Management	Environmental philosophy	0 = Undisclosed; 1 = disclosed
	Environmental objectives	0 = Undisclosed; 1 = disclosed
	Environmental Management System	0 = Undisclosed; 1 = disclosed
	Environmental Education and training	0 = Undisclosed; 1 = disclosed
	Special Action on environmental protection	0 = Undisclosed; 1 = disclosed
	Emergency Response Mechanism for environmental incidents	0 = Undisclosed; 1 = disclosed
	Environmental honors or awards	0 = Undisclosed; 1 = disclosed
	"three simultaneous" system	0 = Undisclosed; 1 = disclosed
Governance situation	Waste Gas Abatement and management	0 = no description; 1 = qualitative description; 2 = Quantitative description
	Wastewater abatement and treatment	0 = no description; 1 = qualitative description; 2 = Quantitative description
	Dust and smoke control	0 = no description; 1 = qualitative description; 2 = Quantitative description
	Utilization and disposal of solid waste	0 = no description; 1 = qualitative description; 2 = Quantitative description
	Noise, light pollution, radiation and other control	0 = no description; 1 = qualitative description; 2 = Quantitative description
	Cleaner production implementation	0 = no description; 1 = qualitative description; 2 = Quantitative description
Environmental Investment	Whether to disclose the amount of environmental investment	0 = Undisclosed; 1 = disclosed
Environmental disclosure	Whether to focus on pollution monitoring unit	0 = Undisclosed; 1 = disclosed
	Disclosure of environmental violations	0 = Undisclosed; 1 = disclosed
Organization certification	Approved by ISO 14001	0 = Undisclosed; 1 = disclosed

According to Table 2, the highest score of environmental information disclosure level of listed companies in heavy pollution industries is 35 points. Each listed company's environmental information disclosure index (EDI) is divided by the best score (35 points) and summed up as follows.

$$EDI = \sum_{i=1}^{264} EDI_i / MEDI \quad (1)$$

### 3.2.2 Explanatory variables-internal governance (InGov) and external pressures (ExPre)

According to the above hypothesis, we select the internal governance situation and external pressure situation of listed companies in the heavy pollution industry to explain their environmental information disclosure level. Three representative three-level indicators are set up under two two-level indicators to determine the weights of the six three-level indicators by using the entropy method. Finally, the values of internal governance and external pressure of the listed companies in heavy pollution industries are obtained as explained in Table 1.

### 3.2.3 Control variable

The company's asset scale and return on equity are taken as control variables to understand the impact of corporate financial characteristics on environmental information disclosure.

### 3.3 Model specification

According to the design of variables, we establish a multiple linear regression model between explained variable and explaining variable by Stata16.0.

$$EDI_{\lambda_i} = \beta_0 + \beta_1 InGov_{\lambda_i} + \beta_2 ExPre_{\lambda_i} + \varepsilon \quad (2)$$

where  $EDI_{\lambda_i}$  represents the environmental disclosure index of the sample,  $\beta_0$  is the constant term,  $InGov_{\lambda_i}$  is the internal governance of the  $i$ th sample,  $ExPre_{\lambda_i}$  is the external pressure of the sample,  $\beta_1, \beta_2$  is the regression coefficient of the model, and  $\varepsilon$  is the residual term.

## 4. Analysis Results

### 4.1 Environmental information disclosure

The major disclosures by listed companies in heavily polluting industries are shown in Table 3. In terms of the form of disclosure, most listed companies choose to disclose environmental information in their annual reports, and others disclose it in the form of environmental responsibility reports. Few companies publish independent environmental reports. The annual report is the main way for stakeholders to obtain information about the company and the main channel of the company's communication for reporting operating results and financial status. None of the listed companies had the best scores for pollution control. The average score of pollution control (3.825) and environmental management (2.598) was higher than that of pollution (1.625). The listed companies in the heavy pollution industry are selective in environmental information disclosure and tend to disclose favorable information. This is reflected in the average score of environmental event disclosure (0.533). For the view of environmental investment (0.166), the lower average value is due to the listed companies' investment in environmental protection is low as 10% of the total investment. Thus, they choose not to disclose the amount of environmental protection investment. From the related organization certification, only 30% of the companies have environmental management system certification (ISO14001) with a higher level of environmental management.

Table 3 Content analysis of environmental information disclosure

Projects		Sample size	Minimum value	Maximum value	Mean value	Standard deviation
Disclose Form	Annual report	1320	0	1	0.947	0.224
	Social Responsibility Report	1320	0	1	0.357	0.479
	Environmental report	1320	0	1	0.027	0.161
Contamination condition		1320	0	5	1.625	1.412
Environmental Management		1320	0	8	2.598	2.182
Governance situation		1320	0	10	3.825	2.948
Environmental Investment		1320	0	1	0.166	0.372
Environmental event		1320	0	2	0.533	0.533
Accreditation of related organizations		1320	0	1	0.300	0.458

## 4.2 Multivariate linear regression analysis

According to the collinearity statistics shown in Table 4, the minimum tolerance is 0.8416, greater than 0.1, and the variance expansion factor is 1.19, much less than 10. Therefore, there is no obvious multicollinearity problem between the explanatory variables.

There is no significant relationship between the level of environmental information disclosure and the internal governance of listed companies in heavy pollution industries. The selected sample lacks a reasonable and effective internal governance mechanism, and the management chooses not to disclose or partially disclose the environmental information of the company for its benefit. The external pressure at the level of 1% has a positive correlation with the environmental disclosure index. Strong external pressure is put on the company, as it forces companies to disclose environmental information actively and comprehensively. The external pressure is greater than that brought by the internal power structure.

Table 4 Results of multiple linear regression analysis of variables

Variable	EDI	COLINEAR statistics	
		VIF	1/VIF
InGov	0.044	1.04	0.9631
ExPre	0.061***	1.19	0.8416
SIZE	0.061***	1.15	0.8676
PRO	-0.031	1.02	0.9766
Constant	-1.122***		
Observations	1,320		
R-squared	0.164		
adj R2	0.161		
F	64.39		

\*\*\*  $P < 0.01$ , \*\*  $P < 0.05$ , \*  $P < 0.1$

## 5. Conclusions and recommendations

### 5.1 Conclusions

With the introduction of related policies and programs, the listed companies in heavy pollution industries have gradually increased their initiative and integrity of environmental information disclosure under the pressure of relevant regulations. However, for the time being, the proportion and level of companies that make environmental information disclosure are generally low. External pressure has a significant impact on the level of environmental information disclosure of listed companies in heavy pollution industries than internal governance.

### 5.2 Relevant proposals

Based on the above analysis, we make the following recommendations.

The relevant legal system needs to be established and improved. Although the Ministry of Environmental Protection of China has issued relevant guidelines and reform plans for environmental information disclosure, it still lacks a complete legal system. Therefore, mandatory regulations for environmental information disclosure should be made specifically according to the actual situation of various industries.

An oversight mechanism needs to be established and improved. The media needs to effectively play its supervisory role. Companies must fully disclose environmental information to give the public a favorable impression. At the same time, the listed companies that have failed to disclose environmental pollution according to regulations need to be evaluated negatively. Public opinion is used to guide the companies to attach importance to environmental protection and increase investment in environmental protection. The government needs to play its regulatory role and provide corresponding support to companies that disclose environmental information actively with financial support. Companies that fail to disclose information according to regulations must be subject to administrative punishment. Creditors also need to take the level of environmental information disclosure of listed companies into account in the loan quota and guide companies to strengthen

environmental protection and achieve sustainable economic development.

## References

- [1] LI Qiang, ZHU Yang-hui. External pressure, corporate governance and quality of Environmental Information Disclosure: Empirical test based on listed companies in coal industry [J] . Economics and management, 2014, 28(03) : 68-73. (In Chinese)
- [2] Valeria Naciti. Corporate governance and board of directors: The effect of a board composition on firm sustainability performance[J]. Journal of Cleaner Production,2019,237.
- [3] NIE Jin-ling, LEI Ling. An empirical study on the correlation among external supervision, internal pressure and environmental information disclosure: Based on the data of listed companies in heavy pollution industries in Shanghai stock market[J]. Accounting newsletter, 2015(27): 72-75 + 129. (In Chinese)
- [4] Hanh Song Thi Pham, Hien Thi Tran. CSR disclosure and firm performance: The mediating role of corporate reputation and moderating role of CEO integrity[J]. Journal of Business Research, 2020,120
- [5] Jaime Andres Correa-Garcia, Maria Antonia Garcia-Benau, Emma Garcia-Meca. Corporate governance and its implications for sustainability reporting quality in Latin American business groups[J].Journal of Cleaner Production,2020,260(prepublish).
- [6] WANG Xia, XU Xiao-dong, Wang Chen. Public pressure, social reputation, internal governance and corporate environmental disclosure: Evidence from listed manufacturing companies in China [J] . Nankai Management Review, 2013, 16(02) : 82-91. (In Chinese)
- [7] HE Bao-cheng and Ren Jia. Measurement model of environmental information disclosure manipulation based on public pressure bundle. Statistics and decision-making, 2020, 36(16) : 163-167. (In Chinese)
- [8] GUAN Ya-mei, ZHAO Rui. Study on the factors influencing environmental information disclosure of listed companies in coal industry [J] . Accounting newsletter, 2017(19): 35-39. (In Chinese)
- [9] XU Dan. External institutional environment, internal control and CSR information disclosure [J] . Journal of Finance and Accounting, 2016(18): 20-28. (In Chinese)
- [10] Suneerat Wuttichindanon. Corporate social responsibility disclosure—choices of report and its determinants: Empirical evidence from firms listed on the Stock Exchange of Thailand[J]. Kasetsart Journal of Social Sciences,2017,38(2).
- [11] Edward Lee, Martin Walker,Cheng (Colin) Zeng. Do Chinese state subsidies affect voluntary corporate social responsibility disclosure?[J]. Journal of Accounting and Public Policy,2017,36(3).
- [12] LI Jun. Study on corporate environmental information disclosure behavior from the perspective of organizational legitimacy. Accounting newsletter, 2017(28) : 17-20. (In Chinese)