



# Corporate Governance Structure's Impacts on the Level of Environmental Disclosure A Case Study of Highly Polluting Enterprises in China's A-share Manufacturing Listed Companies

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**Abstract.** At this stage, any industry that will harm the environment will attract widespread attention from society, especially high-polluting enterprises. Enterprises focus on improving the transparency of relevant information and the level of environmental information disclosure (EID), reducing the damage to the environment and guaranteeing the people's legitimate rights and interests. This paper takes 2247 high-polluting enterprises of China's A-share manufacturing listed companies from 2015 to 2019 as a research sample and uses the method of multiple regression to study the relationship between corporate governance and EID.

**Keywords:** Corporate governance · Environmental Disclosure · Media attention

## 1 Introduction

Modern enterprises create wealth and value for society and individuals simultaneously, but they are also the leading cause of ecological and environmental problems, hefty pollution enterprises, so enterprises have the responsibility and obligation to disclose environmental information to the outside world [1]. China's ecological accounting research started late, especially theoretical research, mostly in the blank stage, the domestic research on environmental information disclosure (EID) is mostly borrowed from foreign countries, rarely for the development of domestic enterprises, the environmental information disclosure to carry out practical research. In the past three decades, some domestic normative research related to the EID, external influencing factors, internal control factors, and empirical analysis has been conducted [2].

Wang Jianming (2008) conducted an empirical study on the relationship between EID [11]. It is found that there are apparent differences between the level of EID in heavy pollution and non-polluting industries. Simon et al. (2001) found that enterprises with larger board sizes are more inclined to disclose environmental information [7], and large-scale boards of directors reduce fraud costs and increase financial transparency; Cong et al. (2011) found that enterprises with dual employment and high equity concentration tend to conceal unfavourable environmental information and even compile fake environmental reports to deceive the government and the public [9]; Clarkson et al. (2008) confirmed that the size, capital intensity, and EID level of the company are

positively correlated [12], and the degree of new and old fixed assets is negatively correlated with the level of EID; Zeng et al. (2010) studied the EID level of Listed Chinese manufacturing companies from 2005 to 2008 [10]. It was found that the environmental transparency of enterprises with the actual controller of the state is higher than that of private enterprises [4]. The proportion of state-owned shares has a promoting effect on EID, which is not unrelated to the fact that state-owned enterprises have the economic backing of the government and need to assume more social responsibilities and environmental responsibilities; Tan Wenshuang et al. (2021) analyzed the data related companies in 2017 and 2018, and introduced media attention [3], believing that responsibility information disclosure enhanced corporate reputation, and then media attention increased the performance of enterprises [4].

Based on the above, it can be seen that there are still some problems in the research content of EID of enterprises at this stage; empirical research needs to be further broadened [5]. To study the relationship between the level of EID of high-polluting enterprises and the degree of equity concentration [6], the degree of integration of the two jobs, the shareholding ratio of management, the size of the Board of directors, and the degree of media attention.

## 2 Research Hypotheses

This paper proposes some hypotheses below.

Hypothesis 1: Negative correlation between ownership concentration and corporate EID.

Hypothesis 2: The size of the Board of directors is positively correlated with corporate EID.

Hypothesis 3: The combination of two jobs and corporate EID is negatively correlated.

Hypothesis 4: Negative correlation between management shareholding and corporate EID.

Hypothesis 5: Positive correlation between media attention and corporate EID.

## 3 Research Methods

### 3.1 Sample Selection

The data from 2015 to 2019 of high-polluting enterprises in China are selected. According to the research purpose and the existing practice, we screen the samples based on: 1) Exclude listed companies whose transaction status is ST and \*ST in the current year; 2) Exclude observation samples with missing relevant data. And all the continuous variables except dummy variables are winsorised with 1% of the upper and lower samples, 2247 samples. The relevant corporate governance data and financial data are derived from the CSMAR database.

### 3.2 Model Construction

The following model for hypothesis testing is constructed:

$$EDI_{it} = \beta_0 + \beta_1 \times CG_{it} + \beta_2 \times Control_{it} + year + Industry + \varepsilon_{it} \quad (1)$$

### 3.3 Definition of Variables

#### 3.3.1 Dependent Variable

Based on the practice of Wu Jianfeng et al. (2015) and data availability, the following methods are adopted for calculation [17]:

We selected six monetary indicators: sewage expenditure (environmental protection tax in 2018), emergency expenditure, ecological protection investment, incomes from pollution reduction waste utilization, and subsidies, exemptions or incentives for ecological protection grants.

#### 3.3.2 Independent Variables

CG says corporate governance, and we explore the impact of the top 10 shareholders on environmental disclosure, including top 10 shareholdings, the board size, management shareholding (MS), duality, and media attention.

#### 3.3.3 Control Variables

We draw on existing literature on variables such as size, leverage, return on total assets (ROA), age, growth, book-to-market ratio (BM), and executive compensation. In addition, we control industry and annual dummy variables.

## 4 Empirical Results and Analysis

### 4.1 Descriptive Statistics

The mean EID value is 1.634, less than 2, indicating that the degree of EID is low, and the difference between the maximum value and the minimum value is large, indicating that there is a large difference in the degree of EID in different samples. Secondly, the average value of the Top10 is 0.587, suggesting that the equity concentration is relatively centralized; the average value of the Board is 8.7777, indicating that the size of the Board of directors is more than 8 people; and the average value of Dual is 0.2222, indicating that nearly 1/4 of the sample CEO's of Chinese listed companies are also the chairman. The average MS is 0.049, indicating that the overall management shareholding ratio in China is low; the media's average value is 5.235, indicating that the Chinese and external media have given enough coverage to highly polluting enterprises.

## 4.2 Correlation Analysis

It reports the Pearson correlation coefficient matrix. We found that EID was significantly positively correlated with Board, EID was significantly negatively correlated with Dual, and EID was significantly positively correlated with Media, which is consistent with our hypothesis. However, EID is significantly positively correlated with Top10, which differs from our hypothesis, and the effect of Top10 on EID needs to be further explored based on regression analysis.

## 4.3 Multiple Regression Analysis

### 4.3.1 Equity Concentration and EID

Among them, we did not control the annual industry fixed effect in column (1), examined the impact of equity concentration on EID, and the results showed that the coefficient of Top10 was  $-0.2855$ , and it was significant at the level of 1%, which initially showed that the equity concentration significantly reduced the EID of enterprises. After further controlling the annual industry fixing effect in column (2), we found that the coefficient of the Top 10 was  $-0.2463$  and significant at the level of 1%, further indicating that there is a negative correlation between equity concentration and corporate environmental disclosure. Therefore, the concentration of equity in Chinese listed companies will significantly reduce the disclosure of environmental information (Table 1).

### 4.3.2 Disclosure of the Size of the Board of Directors and Environmental Information

According to those methods, we listed (1) the annual industry fixed effect, examined the impact of the size of the Board of directors on EID, and the results showed that the coefficient of the Board was  $0.0260$ , and it was significant at the level of 1%, which initially showed that the size of the Board of directors significantly improved the EID of the enterprise. After we further controlled the annual industry fixation effect in column (2), we found that Board's coefficients remained significant. As a result, the size of the boards of directors of Chinese listed companies has significantly increased environmental disclosure [13].

### 4.3.3 Integration of Two Functions and EID

We did not control the annual industry fixed effect in column (1), and examined the impact of the two-in-one on EID, and the results showed that the coefficient of Dual was  $-0.0524$ , and it was significant at the level of 10%, which preliminary showed that the two-job integration significantly reduced the EID of enterprises. After further controlling the annual industry fixing effect in column (2), we found that Dual was still significant at the 1% level, further indicating a negative correlation between the two jobs and the disclosure of corporate environmental information. As a result, the duality of Chinese listed companies will significantly reduce environmental disclosure [14].

**Table 1.** Equity concentration and EID (self-generated)

EID	(1)	(2)
Top10	-0.2855*** (-2.91)	-0.2463*** (-2.57)
Size	0.2189*** (15.15)	0.2580*** (17.81)
Lev	0.6337*** (6.17)	0.3514*** (3.40)
ROA	0.4140* (1.66)	0.158 (0.65)
Age	0.0134*** (4.86)	0.0051* (1.83)
Growth	-0.0658*** (-3.38)	-0.0497*** (-2.62)
BM	0.9156*** (9.45)	0.3455*** (3.37)
Salary	0.0744*** (3.53)	0.00930 (0.44)
Cons	-5.0311*** (-15.38)	-4.8616*** (-14.76)
Ind	NO	YES
Year	NO	YES
N	2247	2247
AdjR <sup>2</sup>	0.335	0.389

#### 4.3.4 Management Shareholding and EID

We examined the impact of management shareholding on EID in column (1) without controlling the annual industry fixed effect, and the results showed that the coefficient of MS was -0.5439 and significant at the level of 1%, which initially showed that management shareholding significantly reduced the EID of enterprises [15]. After further controlling the annual industry fixation effect in column (2), we found that the COEFFICIENT for MS was still significant at the 1% level, further indicating that management holdings significantly reduced the disclosure of environmental disclosures in the enterprise.

### 4.3.5 Media Attention and EID

The final results shown in column (2) show that Media's coefficient is 0.0507, and it is significant at the level of 1%, which initially indicates that media attention has increased the environmental disclosure of enterprises.

## 5 Conclusion

Corporate social responsibility reflects the important responsibility for environmental pollution control and rational utilization of environmental resources. If companies implement effective environmental management models to restrict environmental damage, will such companies with good environmental performance take the initiative to feedback their positive contributions to the outside world. There is a negative correlation between equity concentration and corporate EID; the size of the Board of directors significantly increases the EID of enterprises. The integration of the two jobs significantly reduces the EID of the enterprise; the management shareholding significantly reduces the EID of the enterprise; and the media attention increases the EID of the enterprise.

This paper puts forward the following policy recommendations: First, the government needs to improve and optimize the system for disclosing environmental information, establish a more rigorous EID system, and ensure the positive pricing mechanism of disclosing environmental information in the capital market, so that when companies disclose higher levels of environmental information, they can have a positive effect on it. Second, the government needs to increase the supervision of EID, vigorously support enterprises that perform well in disclosing environmental information by adopting corresponding and practical encouraging preferential policies, and effectively punish enterprises that violate regulations or perfunctory disclosure of environmental information, so that rewards and penalties are clear, that is, make good use of the two major levers of economy and administration, and take a two-pronged approach to encourage enterprises to disclose higher quality environmental information [16]. Third, the government needs to vigorously develop audits of EID to prevent untrue and fraudulent environmental information disclosed by enterprises.

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