Original Research

Entrepreneur Heterogeneity and Environmental Information Disclosure in New Energy Industry: Mediating Role of Environmental Management Practice

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Abstract

Environmental information disclosure is important in implementing enterprise's environmental responsibility, which helps to achieve the carbon peaking and carbon neutrality goal. This paper examines the effect of entrepreneur heterogeneity on environmental information disclosure based on a large sample of Chinese listed companies in new energy industry over the 2008-2020 period. We found that entrepreneur heterogeneity can significantly affect environmental information disclosure. Moreover, environmental management practice can also promote corporate environmental information disclosure and it works as the mediator between entrepreneur heterogeneity and environmental information disclosure. Further, through multi-cluster analysis, we found that environmental information disclosure varies among firms with different characteristics. Our results highlight the importance of environmental disclosure in corporate strategic decisions and deliver multidimensional implications.

Introduction

Since promoting ecological civilization is a significant issue in building a community of human destiny, the Chinese government attaches great importance to environmental issues. The 14th Five-Year Plan promises to achieve the 2030 carbon peak and 2060 carbon neutrality target, highlighting the importance and urgency of promoting green, low-carbon cycle development. As the major natural resource consumers and pollutant emitters, companies are the key actors of environmental governance [1]. Therefore, companies with higher profitability are being demanded to undertake more environmental responsibility. Corporate environmental information disclosure (EID) is seen as a logical way for companies to integrate their environmental concerns and commitments into their goals, values and cultures [2]. Active EID provides more information to stakeholders, including investors,

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employees and customers, and contributes to business management activities and sustainable competitiveness [3]. There is a growing consensus that EID has great advantages in terms of long-term enterprise value [4]. The issue of how to encourage enterprises to fulfill their responsibility of EID consciously has become a hot topic for academics. Many researchers have analyzed the impact of EID on corporate value and finance, innovation, etc. Meng & Zhang [5] applied the Fama-French five-factor model to calculate the cumulative abnormal returns of stocks during the event window, and the results showed that they generated a significant negative reaction among investors to EID when the impact of annual reports is considered. Li [6] found that the quality of corporate EID positively affects the size and maturity structure of corporate bank loans. A study conducted by Ding et.al. [7] demonstrate that EID increases the green patenting activity of high-polluting firms. Zhao [8] explored the link between EID, financing constraints, and firm innovation. The results of the exploration show that EID can promote firm innovation by alleviating financing constraints, and also directly promote firm innovation behavior. At the same time, some studies have relied solely on theoretical sources for the research of EID. Based on the foundations of principal-agent theory and stakeholder theory, Huang & Peng [9] analyzed the impact of EID on corporate risk. Relatively few studies have analyzed the EID about urban. Zhang et al. [10] examined the causal impact of EID on environmental efficiency using panel data of 285 cities in China from 2003-2018. Using the DID method, Li et al. [11] conducted an empirical study of the effects of green technology innovation in 289 cities in China. The results indicate that EID is more likely to promote green technologies as measured by green patent applications.

However, in the absence of a stable and effective legal and regulatory enforcement context, the implementation of EID is greatly influenced by the entrepreneur. As the main decision maker of the company, entrepreneurs play a key role not only in core business strategy, but also in social and environmental strategy and resource allocation. Based on higher-order theory [12], it was found that entrepreneur heterogeneity (EH) (e.g., tenure, functional background, education) influences selective perceptions, interpretations, decisions, and outcomes. Higher-order theory assumes that entrepreneurs cannot understand and process all available information but perceive situations through limited cognitive resources. The limited information perceived is filtered through interpretive processes influenced by entrepreneurs' experiences, values, and personalities, and these perceptions influence the choices and affect the outcome. Since entrepreneurs cannot make entirely rational decisions based on all available information, their choices ultimately reflect their heterogeneity. The description of entrepreneurs varies widely across studies. On the one hand, easily observable demographic characteristics such as gender, age, nationality, and ethnicity on entrepreneurs are significantly influenced by the social environment and social culture in which the company is located, as well as by the industry in which the firm is engaged and the company's characteristics [13]. On the other hand, EH also contains a range of information about the level of education, type of profession, title status, professional background, academic background, affiliation with shareholders, and specific tenure in the company [14]. Such diverse information outlines the basic concept of EH, i.e., the unique characteristics exhibited by the entrepreneurs of a company, which also influence other aspects of the company through its business and management activities. Some studies analyzed the impact from the perspective of variability within the executive team. Luan & Hu [15] found that entrepreneurial fracture zones can significantly inhibit financial irregularities. After constructing a theoretical framework of the link between EH and company growth, Su et al. [16] argued that EH has a significant positive effect on company growth. More researchers focused on the characteristics of entrepreneurs while analyzing their impact. Gao et al. [17] constructed a theoretical model of the impact of EH on company performance and analyzed the moderating role of management discretion. Gupta et al. [18] analyzed the relationship between bank executive team, social responsibility disclosure, and financial data in Nepal based on higher-order theory.

Environmental management practice (EMP) is a part of strategic business management. It refers to a series of standardized contents based on the concept of sustainable development, including environmental protection concept (EC), environmental protection goal (EG), environmental protection management system (EMS), environmental protection education (EE), environmental protection special action (ESA), environmental emergency response mechanism (EERM), environmental protection honors (EPH), and the "three simultaneous" system (TMS) [19]. Existing literature focus on the impact of EMP on improving innovation, firm performance, and employee pro-environmental behavior. Companies conduct different EMP according to different motivations. Building on a summary of prior studies, there are three motivations for companies to implement EMP. (1) environmental regulations: only companies that comply with environmental regulations are considered "legal" and can avoid penalties [18]; (2) economic benefits: in addition to reducing the negative impact of organizational activities on the environment, EMP can generate recycling revenues, promote sales, gain first-mover advantage, improve social reputation, and improve product quality, which leads to economic benefits [19]; (3) competitive advantage: according to strategic management theory, EMP are one of the strategic choices to gain competitive advantage, and by implementing environmental management to build a green image of the company; the negative impact

of competitors who have implemented environmental management earlier can be mitigated. Limited research, however, have focused on entrepreneurs' attitudes toward EMP and their linkage to EID.

The marginal contributions of this paper are threefold. First, our study enriches the literature on EID by incorporating EH and explored the mediating mechanisms of EMP with in-depth analysis. Second, this study contributed to measuring corporate EDI by constructing an expanded framework based on the previous studies and recent regulations. Third, this study selected the new energy industry, which is closely linked to the level of EID. The new energy industry covers a series of non-conventional energy sources, both renewable and clean energy sources, as well as non-renewable energy sources. The internal structure of the industry is relatively complex, and existing studies generally lack detailed analysis of its sub-sectors, as well as analysis of environmental protection in this industry. Therefore, this paper explored the actual level of EID of new energy companies, expanding the analysis of the EID of listed companies, providing more targeted countermeasures for the business and management activities of companies in the new energy industry, and combining EH to form further analysis results and recommendations.

The rest of this paper is organized as follows. The second section introduces the methods and data sources. The results are presented and discussed in the third and fourth sections. The last section concludes the paper.

Methodology

Variables

Environmental Information Disclosure

From the review of related literatures, it is known that the evaluation methods for the level of EID are mainly divided into the following categories: (1) 1 point is assigned for the disclosure of an item of environmental information in the index. (2) A value is assigned to the disclosure content. Among them, general disclosure is measured by 1 point, specialized description is measured by 2 points, and monetized or quantified information is measured by 3 points. (3) Assigning values by dimension. In the prominence dimension, the annual report is divided into financial and non-financial parts, with 1 point for disclosure in the non-financial part only, 2 points for disclosure in the financial part only, and 3 points for disclosure in the financial part and disclosure in the non-financial part. And in the quantitative dimension, those with textual description only are measured with 1 point; those with quantitative but non-monetary information are measured with 2 points; and those with monetary information are measured with 3 points. In the temporal dimension, information about the present is measured by 1 point; information about the future is measured by 2 points; and information about the present compared with the past is measured by 3 points. (4) Value is assigned based on the disclosure status. No description is assigned a score of 0, qualitative description is assigned a score of 1, and quantitative description is assigned a score of 2.

To ensure the scientific nature of the study, this paper selected easily measurable indicators: wastewater emissions (WA), COD emissions (COD), SO_2 emissions (SO_2), CO_2 emissions (CO_2), dust emissions (DUST), and industrial waste (IW) to represent EID. We chose method (4) to score the EID of the selected samples, and if no disclosure data is 0, disclosure of qualitative data is 1, and disclosure of quantitative data is 2.

Environmental Management Practice

In this paper, EMP are selected as mediating variables, specifically environmental protection concept (EC), environmental protection goal (EG), environmental protection management system (EMS), environmental protection education (EE), environmental protection special action (ESA), environmental protection event response mechanism (EERM), environmental protection honor (EH), "three meanwhile " system (TMS). To avoid the subjectivity of the research findings, this paper only classified them by whether they are disclosed or not, and assigned a value of 1 if disclosed and 0 if not disclosed.

The mediating effect of EMP is further tested by the process plug-in in SPSS 25.0. According to the mediation test process proposed by Wen and Ye [20], the total effect formula of the mediation test is shown in (1), and indirect effect formula is shown in (2, 3).

$$Y = c \cdot X + e_1 \tag{1}$$

$$M = a \cdot X + e_2 \tag{2}$$

$$Y = c' \cdot X + b \cdot M + e_3 \tag{3}$$

where Y is the dependent variable, X is the independent variable, and M is the mediating variable; c is the total effect and c' is the direct effect; $a \cdot b$ is the indirect effect; and e_1, e_2, and e_3 are the residuals.

Corporate Characteristics

The level of corporate EID is influenced by other variables in addition to those mentioned above. Therefore, in this paper, the area, size, and year of the company were selected as control variables. Among them, considering that the economic development may have an impact on the EID level, the economic development of the area is used to classify them, and

the area was divided into two categories in this paper, East China and South China have better economic development and take the value of 0, and other regions take the value of 1. Considering that the size of an enterprise may have an impact on the EID, the size of an enterprise is classified by the number of employees, and according to the relevant guidelines, the value is 0 for large enterprises with more than 1000 employees, 1 for medium enterprises with more than 300 employees, and 2 for small enterprises with more than 20 employees. As for the year, after an enterprise becomes a listed company, it will face a greater intensity of stakeholder supervision, and the effectiveness of its supervision may have a certain impact on EID, so it is classified according to the number of years the company has been listed, with a value of 0 for 10 years and below, 1 for 11-15 years, 2 for 15-20 years, 3 for 21-25 years, and 4 for more than 25 years.

The Multi-cluster analysis is used to determine the presence and significance of differences by estimating the parameters (path coefficients) for predefined groups within a sample [21]. If the p-value for the difference in the group path coefficients was less than 0.05 or more than 0.95, a parametric test and the Multi-cluster analysis approach are needed to identify significant differences [22]. We used this technique to investigate the stability and degree of variability of the model under sample populations with different corporate characteristics.

Entrepreneur Heterogeneity

Entrepreneurs, as the top management of the company, mainly hold the management power of the company. The entrepreneur's individual ability affects the entrepreneur's decision-making and thus the EID. While individual ability is difficult to measure, background characteristics are easier to measure. Therefore, entrepreneur heterogeneity is used as a research variable, and sex, age, education, pay, whether a member of the senior management (SE), whether a member of the board directors (BD), whether a part-time member of a shareholder unit (SH), and shareholding ratio (SR) are selected as entrepreneur heterogeneity variables using relevant concepts from demographics.

(1) Sex

According to previous studies, entrepreneurial sex is significantly related to EID, so in this study, sex is selected as the variable for entrepreneur heterogeneity, with a value of 1 for women and 0 for men.

(2) Age

The older entrepreneurs are, the more conservative their behavior tends to be and the more concerned they are about the stable development of the company and its image. EID is a way to show the corporate image, although its disclosure will bring higher costs and thus lead to lower profits, but it provides a certain role to create a corporate image and enhance the favor of stakeholders. Young entrepreneurs, on the other hand,

tend to be more aggressive and often do not have a long-term vision, focusing more on short-term profits. Therefore, in this paper, age was selected as the variable of entrepreneur heterogeneity, and "age = actual age of entrepreneur" is used for most of the data processing. In the descriptive statistics, in order to show the age distribution of entrepreneurs more intuitively, the age is segmented, and the value of 30 years old and below is 0, 31-40 years old is 1, 41-50 years old as 2, 51-60 years old as 3, 61-70 years old as 4, and 70 years old and above as 5.

(3) Education (EDU)

Education affects more than just the ability to learn and the acquisition of professional knowledge. Entrepreneurs with higher education are likely to have higher overall quality and therefore higher environmental awareness. Therefore, this variable is set in order to explore whether education affects the EID. The value 0 is undisclosed, 1 is technical secondary school student, 2 is junior college student, 3 is undergraduate, 4 is graduate, 5 is PhD, 6 is other, and 7 is MBA or EMBA.

(4) Pay

Pay tends to stimulate employees to work more effectively, and the higher the pay, the more dedicated the employees are to creating value for the company. Entrepreneurs' pay also has this effect, and the higher their pay, the greater the corresponding value they bring. In this paper, pay was chosen as a variable, which is assigned a value of 0 if no compensation is received and a logarithm of the reporting period compensation with a base of 10 if compensation is received.

(5) Senior executive (SE)

The entrepreneurs studied in this paper were mainly the directors, supervisors and senior members of the enterprises, so they are categorized and explored, and whether or not they are members of the senior executive is selected as the entrepreneur heterogeneity characteristic variable, which takes the value of 1 if yes and 0 otherwise.

(6) Board director (BD)

As in (5), this paper selects whether or not the board director is an entrepreneur heterogeneity characteristic variable and takes the value of 1 if yes, otherwise takes the value of 0.

(7) Shareholder (SH)

As in (5), this paper selects whether or not the shareholder is an entrepreneur heterogeneity characteristic variable and takes the value of 1 if yes, otherwise takes the value of 0.

(8) Shareholding ratio (SR)

Shareholders are stakeholders of the company and are highly relevant. The larger their shareholding ratio is, the more they care about the business development of the enterprise. Therefore, this paper selects the shareholding ratio as the heterogeneity characteristic variable of entrepreneurs, and uses the "shareholding ratio = the number of shares held at the end of the year/ total shares outstanding in the reporting period*100%"

as the data processing method.

In this paper, EH is studied as the independent variable, EID as the dependent variable, EMP as the mediating variable, and corporate characteristic as the control variable. In summary, the theoretical framework of this research is presented in Fig. 1.

Data

This paper uses Chinese listed companies in the new energy industry as samples to investigate the relationship between EH and EID. According to the Statistical Classification of Energy Conservation and Environmental Clean Industry (2021) and the Guidance on Environmental Information Disclosure of Listed Companies (Draft for Consultation), 313 companies of new energy industries over the 2008-2020 period are selected as the research object. The data was analyzed through Spss25.0 and Amos23.0. The environmental disclosure data are manually collected based on corporate annual reports and corporate social responsibility (CSR) reports released on CNINFO (http://www.cninfo.com.cn/). In detail, we mainly collect data from the annual reports and look through CSR reports, if ever, to doublecheck and absorb extra environmental information. All other corporate characteristics and financial data are from China Stock Market & Accounting Research Database (CSMAR). Finally, a total of 3958 sample data were obtained after excluding vacant values and outliers.

Empirical Analysis

Descriptive Results

Table 1 reports the descriptive statistics. The six predicted variables, which are environmental information disclosure variables, are wastewater emissions, COD emissions, SO_2 emissions, CO_2 emissions, dust emissions, and industrial waste, and according to their mean values, it can be found that the companies that do not disclose data account for a relatively large proportion, with the worst disclosure of industrial waste.

Second, the eight explanatory variables, i.e., those belonging to entrepreneur heterogeneity, were analyzed. The mean value of SEX is 0.151, suggesting that in new energy industry, the proportion of male members of the entrepreneur is significantly higher than that of female (See Fig. 2a) for details). As for AGE, the range is between 25-83, mean value 2.863, indicating that the average age of entrepreneurs is around 49 years old (See Fig. 2b) for details). The mean value of education
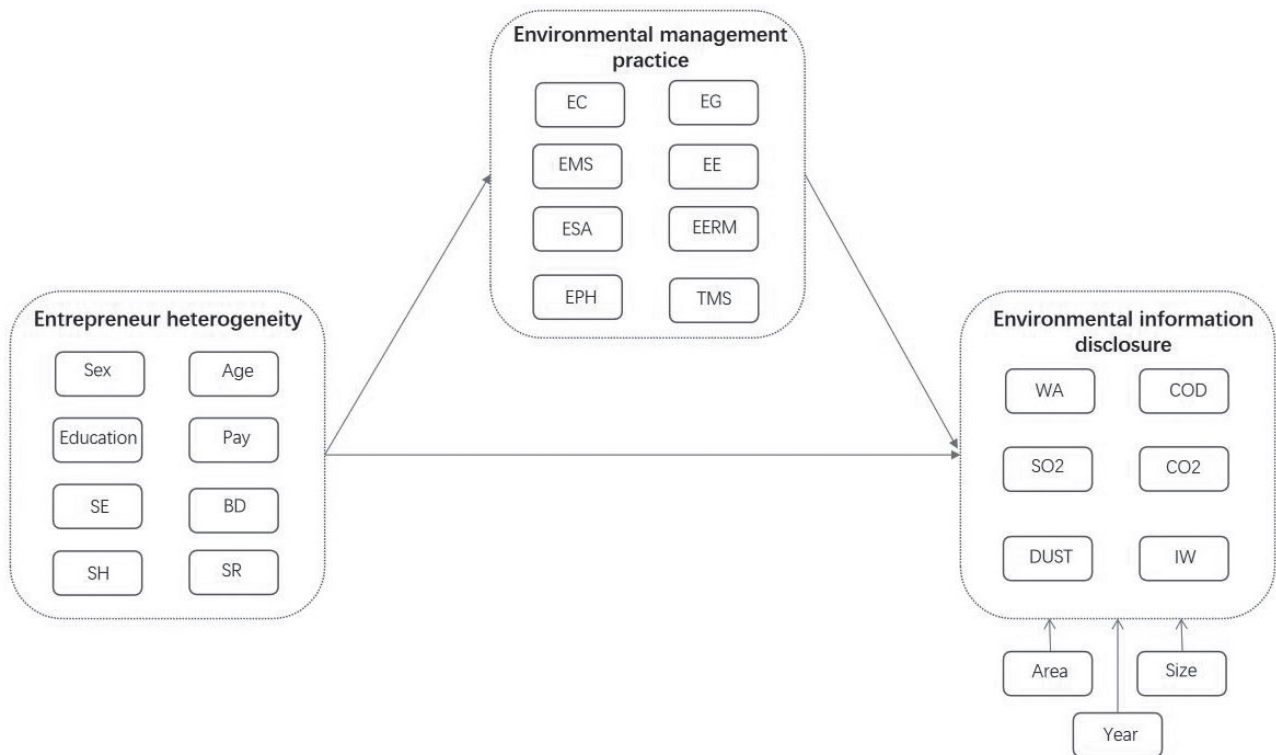

Fig. 1. Theoretical framework.
Abbreviations: SE: senior executives, BD: board director, SH: shareholder, SR: shareholding ratio, EC: environmental protection concept, EG: environmental protection goal, EMS: environmental protection management system, EE: environmental protection education, ESA: environmental protection special action, EERM: environmental protection event response mechanism, EPH: environmental protection honor, TMS: "three meanwhile" system, WA: wastewater emission, IW: industrial waste.

(EDU) is 4.367, which means that the majority of entrepreneurs in listed companies in the new energy industry disclose their education. Fig. 2c) illustrated the percentage of each academic degree. It can be seen that most of the entrepreneurs are highly educated, with 78% of them having a bachelor's degree or above. Of the sample data, 31% of entrepreneurs are members of the executive team, 47% are members of the board, and only 19% of directors and supervisors serve part-time in shareholder organizations. Pay for entrepreneurs varies widely from approximately tens of thousands of RMB to hundreds of thousands of RMB.

Third, in terms of control variables, East China and South China account for 46.49%, and other regions account for a higher proportion than East China and South China, indicating that the location of companies in the new energy industry are more often set up in relatively backward regions; the specific situation of enterprise size is shown in Fig. 2d), with large

enterprises accounting for 81%, medium enterprises accounting for 15%, and small enterprises accounting for 4%, revealing that the enterprise size of listed companies in the new energy industry is mostly large. The details of the years of enterprises are shown in Fig. 2e), among which, 16% are 10 years or below, 34% are 11-15 years, 33% are 16-20 years, 15% are 21-25 years, and 2% are 25 years or above, depicting that the listed companies in the new energy industry have been listed for a long time.

Finally, we analyzed the mediating variables, which are eight indicators, namely, environmental concept, environmental objectives, environmental management system, environmental education, environmental special action, environmental event response mechanism, and "three simultaneous" system. The best disclosure is the environmental management system, and the worst is the environmental education.

Reliability and Convergent Validity

In the light of EE, EPH, EDU, and SE have standardized factor loading (SFL)<0.5, this study excluded these indicators [23]. Finally, the reliability of the current data is checked through composite reliability (CR) given in Table 2. The CR for EMP, EID, and EH are all >0.6, so the reliability of the data of all these

Table 1. Definition of each indicator.

Variable	Max	Min	Mean	STDEV
WA	2	0	0.462	0.647
COD	2	0	0.1	0.401
SO_2	2	0	0.099	0.334
CO_2	2	0	0.054	0.308
DUST	2	0	0.312	0.515
IW	1	0	0.015	0.123
EC	1	0	0.299	0.458
EG	1	0	0.16	0.366
EMS	1	0	0.342	0.474
EE	1	0	0.059	0.236
ESA	1	0	0.109	0.312
EERM	1	0	0.197	0.398
EPH	1	0	0.172	0.377
TMS	1	0	0.158	0.365
AREA	1	0	0.391	0.488
SIZE	2	0	0.613	0.498
YEAR	1	0	0.593	0.535
SEX	1	0	0.151	0.359
AGE	5	0	2.863	0.63
EDU	7	0	4.367	1.863
PAY	6.872	0	3.985	2.317
SE	1	0	0.311	0.463
BD	1	0	0.475	0.499
SH	1	0	0.192	0.394
SR	14.283	0	0.063	0.743

Table 2. Reliability and convergent validity.

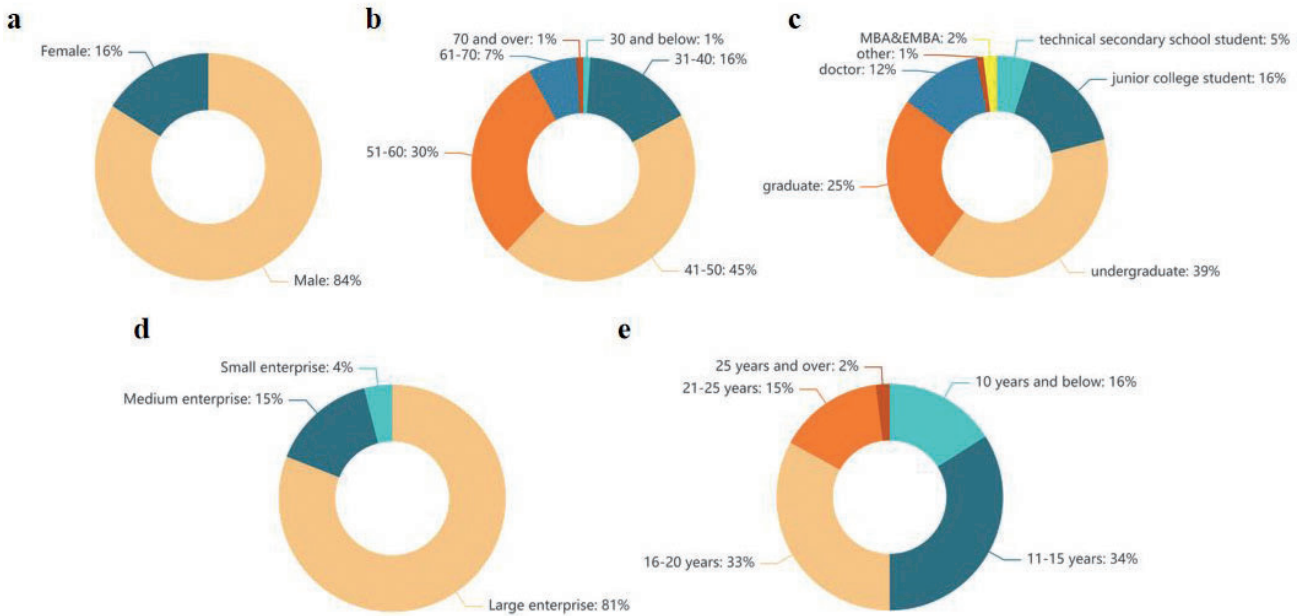| Variable	Item	Standardized factor loading (SFL)	CR	AVE
EMP	EG	0.698	0.6774	0.6611
	EMS	0.744		
	ESA	0.918		
	EERM	0.943		
	TMS	0.867		
	EC	0.654		
EID	COD	0.839	0.6062	0.7631
	SO_2	0.855		
	CO_2	0.912		
	DUST	0.782		
	IW	0.789		
	WA	0.519		
EH	SH	0.900	0.6955	0.7411
	BD	0.871		
	PAY	0.782		
	AGE	0.770		
	SR	0.802		
	SEX	0.550		

Fig. 2. The distribution of characteristics of entrepreneurs and enterprises in the sample.

variables is confirmed [23]. The convergent validity of this data is checked through indicators of AVE that are proving the convergent validity of the current data because EMP, EID, and EH have AVE>0.5. Hence, the current data has good reliability and convergent validity.

Model Fitness

The fitness of the current model containing EMP as independent variables, PE as dependent variable, and EID as a mediator has been checked through CFA (Table 3). It is found through the results of CFA that all five indicators of model fitness are showing appropriate values for the current model because X^2/df is <5, GFI is >0.9, IFI as well as CFI are >0.8, and RMSEA is <0.08, so the current model has the good fit.

The suitability of the current data and model is further confirmed through KMO value because KMO for the current data is >0.6, so the current model is good fit and suitable.

Direct and Intermediate Effects Test

The figures given in Table 4 are showing the results of SEM. It is found that EH has a significant influence on EMP and EID because p values against its effects on these variables are all <0.05; meanwhile, EMP also

significantly affect EID. Hence, However, the total effects of EH on EID are not wholly their direct effects, which means that there is some indirect effect of EH on EID as well.

From Table 5, the R^2 of the four regression models were 0.524, 0.442, 0.478, and 0.662, which means that the models fit well; the significance of the F-test used to test whether the models are valid reached the statistical standard, so the regression models are valid. Therefore, all the effects are valid. As for Table 6, the 95% confidence interval of a*b does not include 0 and the regression coefficients a and b hold, i.e., the mediating effect of environmental management practices holds, while the indirect effect c′ also holds. It is clear that the indirect effects of EH on EID are caused by the mediator, that is, EMP implementation. It is found that EH causes significant effects on EID through EMP implementation (p value <0.05 for each). However, the indirect effects of EH on EID through EMA implementation are not larger than direct effects of EH on EP (see Table 6). It means that the EMP implementation has shown a significant partial mediation between EH and EID, not full mediation. EH significantly enhance the implementation of EMP, which in turn enhances the EID of the company. Hence, there is significant partial mediation of EMP implementation between EH and EID.

Table 3. Confirmatory factors analysis and KMO.

CFA indicators	GFI	CFI	IFI	RMSEA	X^2/df	KMO
Threshold value	≥0.9	≥0.8	≥0.8	≥0.08	≥5	0.6-1.0
Observed value	0.923	0.835	0.878	0.072	3.877	0.724

Abbreviation: CFA, confirmatory factor analysis.

Table 4. Standardized total effects derived from the SEM.

			Beta value	STDEV	C.R.	P
EH	→	EMP	0.41	.022	5.220	***
EH	→	EID	0.85	.045	8.223	***
EMP	→	EID	0.21	.027	7.418	***

Table 5. Standardized indirect effects derived from the SEM.

Model	Beta value	STDEV	R^2	F	t	p
X→Y	0.441	0.021	0.524	12.715**	4.331	0.011
X→M	0.227	0.027	0.442	5.779*	4.784	0.016
M→Y	0.214	0.317	0.478	5.314*	3.218	0.021
X→M→Y	0.121	0.018	0.662	8.413**	2.997	0.042

Table 6. Intermediary role test results.

	c (total effect)	a	b	a*b (indirect effect)	a*b (95%BootCI)	c′ (direct effect)
X→M→Y	0.441	0.227	0.214	0.04859	0.124~0.344	0.121

Multi-Cluster Difference Test Analysis

In order to check the stability and variability of the model under sample groups with different corporate characteristics, this paper performs a multi-cluster difference test analysis on the final structural equation model, restricting different parameters to obtain various nested models. Table 7 presents the resulting model with the baseline model as a way to check the constancy of the structural equation model and to explore whether there is variability in the causal paths under different sample groups. The results of the multi-cluster analysis were as follows.

As can be seen from Table 7, in the Area cluster, except for the benchmark model, the p-values of the model invariance test results are all greater than 0.05, which means that the model has constancy under different regional conditions. In the Year cluster, the p-values of the significance of the invariance tests of the four models, except for the benchmark model and the measurement weighting model, are also greater than 0.05, indicating that the models have constant rows under the conditions of different time spans, and the Year variables will not affect the results of the model. However, in the size cluster, except for the measurement weighting model, the invariance tests of other models are less than 0.05, that is, the model results are changed under different scale conditions. In order to further explore the changes of model results under different size, this paper divides the original model into three models, and then discusses the influence of size on the

model according to the results of the three model paths established (see Table 8).

Among different sizes of enterprises, the EID of small enterprises is affected significantly different from other sizes of enterprises. The p-values of all three paths for small enterprises are greater than 0.05, i.e., there is no significant influence relationship between EH, EID and EMP in small enterprises. However, the path coefficients become larger as the size increases, thus the larger the company, the higher the quality of its EID.

Discussion

General Discussion

The current study examines the influence of EH on EID with the moderation of EMP between them. The path regarding these relationships have been tested by collecting data from clean energy source companies of China. In response to this, results of SEM reveal that EH significantly affect the EP of the company. It is because entrepreneurs have different understanding and perceptions of environmental protection due to their personalities and cultural backgrounds, it affects the level of EID by companies. As indicator EDU and BD failed the reliability test, it is suggested that EH including AGE, SEX, SR, SH, SE, and PAY is significant deriver of EID of the firm. These results find considerable theoretical support from the institutional

Table 7. Structural equation model invariance test.

Group Category	Parameter-limited model	$\Delta\chi^2$	Δdf	P
Area	Benchmark Model	374.23	144	0.001
	Measurement weighting model	12.45	11	0.452
	Structural weighting model	45.77	40	0.234
	Structural covariance model	51.23	40	0.412
	Structural skew error model	14.11	12	0.314
	Measurement error model	18.45	15	0.379
Year	Benchmark Model	512.4	254	0.000
	Measurement weighting model	35.11	20	0.001
	Structural weighting model	17.22	13	0.217
	Structural covariance model	18.77	17	0.432
	Structural skew error model	22.13	18	0.174
	Measurement error model	32.15	29	0.087
Size	Benchmark Model	454.13	214	0.000
	Measurement weighting model	41.23	30	0.061
	Structural weighting model	21.79	10	0.009
	Structural covariance model	18.14	5	0.000
	Structural skew error model	81.25	44	0.014
	Measurement error model	72.69	47	0.016

Table 8. Path coefficients of different companies.

Path			Small enterprise		Medium enterprise		Large enterprise	
			Coefficient	P	Coefficient	P	Coefficient	P
EH	→	EMP	0.115	0.074	0.145	***	0.157	***
EH	→	EID	0.227	0.214	0.289	***	0.219	***
EMP	→	EID	0.299	0.067	0.314	***	0.337	***

theory and previous studies. Being educated does not mean having a higher level of overall quality, nor does it mean having a higher level of environmental awareness [24]. Financial expertise and tenure of CEOs are positively correlated with corporate EID [25]. Board members concern themselves more with the EID of the company, the future development of the company is closely related to its future earnings, and board members will pay more attention to the long-term development of the company [26].

The next path of the present research is about the mediation of EMP between EH and EID. It is found through results of the study that EMA implementation acts as significant mediator between EH and EID. This paper introduces the concept of EMP, which focuses on the theoretical content of environmental protection-related concepts, systems, and measures announced by companies, whose disclosure makes EH positively affect EID. EC, EG, EMS, ESA, EERM, and TMS played an important role in the mediating effect of EMP. In the course of the study, it was found that fewer new energy companies disclosed EE and EPH, possibly because the study was not comprehensive due to the sample size, or perhaps because these two items are indeed rarely covered by new energy companies.

The last type of relationships tested in the current study is the influence of corporate characteristics including size, area, and year on EID. First, results show that the level of EID is not higher for companies in East and South China. However, Yang [27] pointed out that there is a significant difference between the level of EID in developed countries and non-developed countries, and the degree of economic development affects the level of EID of enterprises. Both East China and South China are among the more economically developed regions, but this conclusion is

not confirmed in this study. It may be due to the fact that the different economic development patterns and degrees of economic development in China do not cause differences in the level of EID, and the overall level of EID in China is more consistent. Second, Watts and Zimmerman [28] argue that larger enterprises are more politically sensitive and thus more likely to be noticed by the public and thus incur higher political costs. Thus, the larger a company is, the more it is able and inclined to disclose better quality environmental information in order to reduce the attention of the government and society [29]. Based on stakeholder theory and legitimacy theory, domestic and international studies on the relationship between enterprise size and the level of EID are more consistent in their findings, and this paper also confirms that the larger the enterprise size, the higher the level of EID. Third, the older the company is, the higher the level of EID will not be. Generally, the longer a company has been listed, the more attention it receives from society and the public, and therefore the more attention it pays to the level of EID in order to create a better corporate image. However, in this paper, this finding is not confirmed. This may be due to the fact that the awareness of environmental protection in our society is still relatively weak, and the relevant government departments have not made mandatory and clear regulations on the disclosure of environmental information in the new energy industry [30].

Practical Implication

This paper makes the following recommendations to promote active corporate environmental responsibility and EID. In this high-speed development information age, the shaping of corporate image is particularly significant, and a good corporate image can effectively enhance the competitiveness of the enterprise. For the present, the lack of EID on many enterprises in China attracts public attention. At a time when environmental governance is particularly important, companies could assume environmental responsibility, actively promote environmental awareness and improve EID through the appointment of human resources and the establishment of EMP. Based on the study, this paper makes the following three recommendations: First, companies could focus on entrepreneurial background characteristics and further improve the talent-related system for listed companies in the new energy industry. Specifically, companies could balance the age distribution of their executive team; should not overly value education in the recruitment process, but examine their overall quality; and should develop a reasonable salary plan to achieve motivation. The higher the shareholding of the enterprise the higher the quality of EID by the entrepreneur, and the enterprise may give an appropriate amount of shares to the entrepreneur to further enhance the relevance of the entrepreneur's interests. Second, companies should

establish appropriate EMP to enhance EID. Through this study, companies that disclose their environmental protection philosophy, environmental protection objectives, environmental management system, environmental protection special actions, environmental incident response mechanism and "three simultaneous" system have a higher level of EID. It also positively influences the disclosure of environmental information by entrepreneurial heterogeneity. Third, external stakeholders could play a supervisory role. In addition to the role of internal enterprises themselves, the supervision and management of external stakeholders can also effectively influence enterprise decisions. Therefore, we can consider the influence of external stakeholders on the level of EID of enterprises, so as to achieve the purpose of improving the current situation of environmental information disclosure. As far as the actual situation in China is concerned, the EID of enterprises can be regulated by external coercive force, such as the formulation of laws and regulations, industry guidelines, etc., so as to achieve the goal of environmental management.

Conclusion

The present study attempts to assess the impact of EH on EID and the mediation of EMP implementation between EH and EID of the enterprise. The data collected from listed companies of new energy source in China reveal that EH is a significant predictor of EID while implementation of EMP is a significant mediation between them. It has been further found that there is little difference in EID between the region where the company is located and the number of years the company has been in business. However, the larger the company, the more adequate its EID. We obtained some insightful results in this study, but further studies are still needed. The present study is limited to a single sector, that is, new energy source sector and a single country, that is, China, so results are not generalizable to enterprises operating in other sectors and all developing or developed countries. Therefore, future researchers should perform cross-sector and cross-cultural studies to confirm and generalize these relationships. In addition, the sample data used for the analysis in this study were cross-sectional or static data from a specific period. Thus, it was impossible to detect changes in entrepreneurs' perspectives of EID. In conclusion, a follow-up study could use a longitudinal design method with regular monitoring and validation to produce more accurate and scientific results.

Conflict of Interest

The authors declare no conflict of interest.

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