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Chemical and pharmaceutical company's carbon disclosure empirical research -depending CDP China reports

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ABSTRACT

In the context of intensified global climate change,to study the factors affecting the disclosure of Chemical and Pharmaceutical Companies' carbon in China,the paper descriptivelyevaluates the present situation of Chinese enterprises carbon disclosureand then empirically analyses from five aspects, such as company location,company size,the proportion of outstanding shares,the company profitability and the company's liabilities, which isbased on CDP China Report 2008-2013.This paper finds that the large-scaleChemical and Pharmaceutical enterprises in the economic developed area are willing to disclose more information about carbon. And the other factors have no significant influence in disclosure of carbon.

Keywords: Chemical and Pharmaceutical Companies; Carbon disclosure; Disclosure of present situation; Influencing factors.

INTRODUCTION

The earth is the common home of mankind, in order to effectively respond to global climate change, alleviate the environmental pressure, governments and enterprises need to work together, be shared responsibility and find common solutions. In recent years, the global natural disaster aggravates, making people in the whole world pay more attention to enterprise carbon information disclosure. Some developed economies are brewing promoting the carbon tax and industry' s carbon emission standard's implementation. China and other developing countries are facing more and more pressure in the carbon reduction issues. At the same time, investors and consumers, urgently, need to know whether enterprises have been ready to respond to climate change.

In recent years, domestic and foreign scholars have started to undertake academic research of enterprise carbon disclosure. Based on the data of CDP, Doran and Quinn found that, although the United States S & P 500companieshas been greatly improved than before, but the related extent of the disclosure of carbon information still has not obtained the very big success[1]. Also, Elizabeth Stannyfound by studying theUnited States S & P 500 companies' s date provided by CDP from 2006 to 2008,that the most enterprises do not provide greenhouse gas related data, and the company's prior disclosure level has great influence in the voluntary disclosure level now[2]. About empirical research,Stanny and Ely showed that whether the companies disclosed the greenhouse gas emissions, was influenced by the size of the company, prior disclosure and other factors[3]. Peters and Rom studied the country—level factors' effects on carbon disclosure according to the data of the 28 national companies from 2002 to 2006. The study shows that the supervision of the national government and the country's market structure has a decisive impact on the level of information disclosure on corporate carbon[4].

Carbon accounting in China started relatively late. What`s more, research results are less and mainly about the description of the CDP[5], reveal of the domestic enterprise carbon, disclosure about discussions on the current situation, exploration about carbon disclosure of information framework and some other qualitative research. But

there are lack of quantitative analysis and more rare studies about the carbon disclosure factors. This paper will be based on this starting point, draw lessons from domestic and international literature, tries to analyze the present situation of Chemical and Pharmaceutical Enterprise carbon disclosure of information, as well as the influence factors of carbon disclosure of information, through the empirical method. And it puts forward relevant suggestion, in order to improve the Chemical and Pharmaceutical Company'sconsciousof carbon disclosure of information .What is more, we hope it helps better carbon information disclosure system coming on stage.

EXPERIMENTAL SECTION

1.Research design

1.1 Research hypothesis

1.1.1 Company location

The economic developed area where the local governments pay more attention to urban green construction and environmental protection has more strict control[6]. Meanwhile the local social public also pays more attention to environmental protection and the enterprises' relevant environmental information disclosure. So we put forward the first hypothesis:

Hypothesis 1: The company located in the developed areas has a higher level of carbon information disclosure than which located in the less developed areas.

1.1.2 Company size

The bigger listed Chemical and Pharmaceutical Companyhave been more concerned and face greater social pressure. Whether the company's own demands, policy guidance or public attention, all need the company to provide more and more detailed information.Clarkson proved that there has been a positive correlation between the size of the enterprise and environmental information disclosure level through the empirical study. So this paper puts forward the second hypothesis:

Hypothesis 2:Company size and enterprise carbon disclosure levels are positively related.

1.1.3 Corporate ownership structure

Almost all listed companies in China have "insiders' control" problem, that is, the shareholders' meeting is in the hands of insiders, leading to a very low percentage of the outstanding shares, so that tradable shareholders can hardly have an impact on the company management behavior through the shareholders' meeting. But current shareholders may refuse to buy or sell the stock of the company according to the company's disclosure. So in order to fund their own image acquisition, and later to financing, the listed company will be willing to disclose to the public the information as much as possible[7]. Based on the above analysis, we put forward the third hypothesis:

Hypothesis 3: The enterprise proportion of outstanding shares and the level of carbon information disclosure are positively related.

1.1.4 Company profitability

According to the signal theory, better performance of enterprises voluntarily discloses more information to let the market correctly assess its level of profitability, in order to attract more capital, as well as to avoid the stock price being undervalued by the market. At the same time, Contract theory says that inthe highly profitable company, managers are more willing to disclose information[8]. Miler found that with the improvement of the level of corporate profits, the company's level of disclosure of information will riseaccordingly. So this paper puts forward the hypothesis:

Hypothesis 4: The companies with strong profitability have high levels of carbon disclosure.

1.1.5 Company debt level

If the enterprise financial leverage ratio is high, the shareholders need to know more environmental information to evaluate the enterprise's practical value so as to determine their own investments[9]. At the same time, creditors also expect the enterprise more information disclosure, reducing the risk of debt. According to the above analysis, we put forward the following hypothesis:

Hypothesis 5:Companies with higher debt level tend to disclose more carbon information.

1.2 Data sources and variable design

1.2.1 Data sources

This paper takes the Chemical and Pharmaceutical Companies as the research object, selecting the 20 listed companies

in the CDP 2008-2013 China Reportsas samples, eliminating the company having incomplete information and the effective sample is 20. These sample companies distributed in chemical and pharmacy. All data is fromCDP 2008-2013 China Reports, the Shanghai Stock Exchange (http://www.sse.com.cn) and the Shenzhen Stock Exchange (http://www.szse.cn).

1.2.2 Variable design

The dependent variable—EDI

EDI: the level of corporate disclosing carbon information to the public through the CDP questionnaire. The carbon disclosure level of the first I enterprises is recorded as EDI_I, equal to the sum of each item score of the first I enterprises' carbon disclosure. Carbon information disclosure items and grading methods are shown below:

Table 1: level of carbon information disclosure of Chemical and Pharmaceutical Company's score sheet

No	Items	Scoe	Explanation
1	The incentive mechanism provided for climate changing	10	Qualitative description, detailed 10points, general 5points
2	The business strategy includes the process and results of climate change	10	Qualitative description, detailed 10points, general 5points
3	The effective emission reduction within the annual report	10	Qualitative description 5points, quantitative 10points
4	The action of emission reduction within the annual report	10	Qualitative description, detailed 10points, general 5points
5	Risk brought by the climate changing	10	Qualitative description, detailed 10points, general 5points
6	The cost of taking management	10	Qualitative description 5points, quantitative 10points
7	The opportunities brought by the climate changing	10	Qualitative description, detailed 10points, general 5points
8	Discharge base year and emissions	10	Qualitative description 5points, quantitative 10points
9	Collect an emissions emission standard or method	10	Qualitative description, detailed 10points, general 5points
10	Participate in any emissions trading	10	Qualitative description, detailed 10points, general 5points

（1） The explaining variable

① Company place

PLACE: Divide 20 sample companies into two kinds: developed place(Jiangsu, Zhejiang, Shandong, Guangdong, Shanghai)=1; other place=0.

② Company size

SIZE: Company's total assets in the reports divided by 10(in logs) say the size of the company.

③ Company's current ratio

LIUTV: The proportion of company's tradable shares accounting for the total shares in the reports.

④ Company profitability

EPS: The company's return on equity (the percentage rate acquired by the company after-tax cost being divided by the net assets) represents the EPS.

⑤ Company debt

LER: The total liabilities divided by total assets at the end of 2011.

Built the model with PLACE, SIZE, LIUTV, EPS and LER：

$$EDI_I = b_0 + b_1 PLACE + b_2 SIZE + b_3 LIUTV + b_4 EPS + b_5 LER$$

RESULTS AND DISCUSSION

1.Descriptive statistical analysis of the sample companies

Table 2 lists the descriptive statistical results of all variables in the model, including: mean value, maximum, minimum, standard deviation and sample size. Among the table, we can see the carbon disclosure level (EDI) average is 25.78, which declares that the carbon information disclosure level is poor. And the EDI standard deviation is 29.924, maximum is 20 and the minimum is 0, explain that the carbon information disclosure level between enterprises has great difference.

Table 2 variable descriptive statistics

Statistics							
		EDI	PLACE	SIZE	LIUTV	EPS	LER
N	Valid	20	20	20	20	20	20
	Missing	0	0	0	0	0	0
Mean value		25.78	0.64	10.937	0.7768	0.031465	0.6176
Mid—value		0.00	1.00	10.817	0.8130	0.031770	0.6062
Standarddeviation		29.924	0.481	0.9662	0.2536	0.036151	0.2165
Minimum		0	0	8.8707	0.0335	-0.09598	0.0645
Maximum		20	1	13.215	1.0000	0.152508	0.9469

2.Correlation and regression analysis

Before regression analysis, test the correlation between each variable. The result shows that the correlation between the company size and asset-liability is strong, which may cause the multicollinearity of the regression equation. So this paper uses a stepwise regression method for regression analysis.

Table 3 shows that the result of regression factors having significant influence on the carbon disclosure level through the stepwise regression method test. And it concludes two models.

Table 3 Significant variable regression coefficient

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	PALCE	9.241	3.151	0.298	2.933	0.004
2	PLACE	15.477	6.238	0.270	2.674	0.015
	SIZE	7.933	3.107	0.270	2.674	0.012

Model 1 only introduces one variable-PLACE. The regression coefficient between PLACE and EDI is significant positive (9.241,$p=0.004<0.01$), which shows that because of the local government and public pressure, the chemical and pharmaceutical companies located in the economically developed areas are willing to disclose the carbon information to the media and the public, in order to maintain the image of the company and realize their own long-term sustainable development. Therefore, the hypothesis 1 is established.

Model 2 introduces another variable-SIZE on the basis of model 1. The SIZE and EDI have the significant positive regression (7.933,$p=0.012<0.05$). According to the model 2, set up the multivariate regression equation: EDI = 70.964 + 15.477 PLACE + 7.933 SIZE. After t test, the P value of b1 and b2 is 0.012 and 0.015 respectively and both are significant with EDI. Data shows that the larger chemical and pharmaceutical companies will be voluntary disclosure more carbon information, due to more constraints and pressure. Model 2 supports the hypothesis 1, and also explains that the hypothesis 2 is established.

CONCLUSION

1. Research conclusions

(1). Recent years, the Chinese chemical and pharmaceutical companies' situation of carbon disclosure is poor, and we also need enhance the consciousness of the global climate change. From 2008 to 2013, among the 20 chemical and pharmaceutical companies surveyed, there are 4 (20%) enterprises respond to the survey. Due to the nature of the industry, most of the chemical and pharmaceutical companies unwilling to disclose too much information of carbon.

(2). Through the empirical research into the factors influencing Chinese chemical and pharmaceutical companies carbon information disclosure, we found that the main influence factors are from the government's supervision and the social public pressure, which mainly come from the external power.

(3). The chemical and pharmaceutical companies located in economically developed areas, due to the local environmental protection, the government's policy and social public attention, the companies tend to disclose more information on carbon.

(4). Thechemical and pharmaceutical companies' scale is bigger, in the face of the pressure of media and social, they more voluntarily disclose carbon information.

(5). The Investors, creditors and enterprise managers have no significant effect to the chemical and pharmaceutical companies' carbon disclosure level.

2. Policy suggestions

(1). Improve the chemical and pharmaceutical companies' consciousness of carbon information disclosure

Enhancing the chemical and pharmaceutical companies' consciousness of carbon information disclosure is the basic method to improve the carbon disclosure level. Let the chemical and pharmaceutical companies to realize that the opportunity and risk brought by climate change is closely linked to the enterprise's own interests. And including carbon disclosure into the enterprise's strategy and daily management is the effective way of enterprise to keep long-term and sustainable growth.

(2). Set the industry unified carbon disclosure standards and mechanism

According to the characteristics of chemical and pharmaceutical industries, the government and relevant policy

makers should uniform carbon disclosure standards and system in various industries as soon as possible, to guide and constrain the content and form of the carbon disclosure, as well as evaluate reasonably under a unified standard, clearing corporate's responsibility.

(3). Incentive enterprise to voluntarily disclose carbon information
From the empirical study of factors affecting the level of carbon information disclosure, we can see that Chinese chemical and pharmaceutical companies' carbon disclosure level is mainly affected by the pressure from society and government at present.

Therefore, in order to encourage more enterprises to participate in the carbon information disclosure and improve the quality of corporate carbon information disclosure, the relevant departments and policy makers may develop a relevant incentive system to reward the chemical and pharmaceutical companies with a good performance, so as to enhance the enthusiasm of the enterprises in China.

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