

A RESEARCH ON CHARACTERISTICS OF TOP MANAGEMENT TEAM, ENVIRONMENTAL RESPONSIBILITY AND CORPORATE VALUE

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Abstract

Characteristics of top management team determine the quality of their decision-making. The environmental problems have been paid increasing attention in the course of economy development. Corporations are supposed to undertake more and more social responsibilities, especially environmental responsibility, which directly affects the overall corporate value and even its sustainable development. Based on the literature review about the relevance of environmental responsibility and corporate value, the relevance of characteristics of top management team and corporate value and the relevance of top management team and environmental responsibility, a positive correlation between environmental responsibility and corporate value is demonstrated through theory and empirical methods. The characteristics of top management team, such as team member's age, tenure and professional background, are introduced to moderate the correlation between environmental responsibility and corporate value. Therefore, we concluded that corporations should actively take environmental responsibility, which helps to promote the corporate value and optimize the characteristics of the top management team to improve their fulfillment of environmental responsibility, so as to improve the corporate value.

Keywords: Family enterprises, TMT, characteristics of top management, environmental responsibility, corporate value, multiple regression

INTRODUCTION

With the development of society and economy, characteristics of top management team and their improvement basically determine the quality of their decision-making. The environmental problems have been paid increasing attention in the course of economy development. Corporations are supposed to undertake more and more social responsibilities, especially environmental responsibility, which directly affects the overall corporate value and even its sustainable development. At the same time, the society has an increasing demand for corporations to undertake environmental responsibility. As effective subjects implementing circular economy, corporations ought to undertake the dual responsibilities of economic development and environmental protection, which gets the direct benefits of circular economy. With the expansion of business scale and improvement of market economy system, it has an extremely important meaning for Chinese corporations realizing the green economy and corporate value to relieve the increasingly prominent contradictions of environmental responsibility exposed in the course of corporate operations. Most of the home and abroad researches separately discuss the relevance of corporate social responsibility (including environmental responsibility) and corporate value, the relevance of characteristics of top management team members and corporate value and the relevance of top management team and corporate social responsibility (including environmental responsibility), while little literature combine all the three factors to study. For this reason, based on signaling theory, upper echelons theory and embeddedness perspective of top management team, a proxy indicator of corporate environmental responsibility (CER) was established through content analysis method to further explore the relationship among characteristics of top management team, corporate environmental responsibility and corporate value. The characteristics of top management team are introduced as moderating factors to investigate its effect on the relationship between environmental responsibility and corporate value. It is proved workable for corporations to maintain a strong competitive power and sustainable development via building a reasonable and effective top management team structure to actively undertake environmental responsibility and so as to raise the corporate value.

REVIEW OF RELEVANT LITERATURE

Study on the correlation between environmental responsibility and corporate value

Many scholars have had in-depth discussions about the correlation between social responsibility and corporate value since Friedman first to study this correlation. However, discussions about the relationship between social responsibility (including environmental responsibility) and corporate value don't achieve an agreed conclusion. Russo & Fouts (1997) suggested that it

helps to improve corporate reputation and prestige and bring corporations more competitive advantages through optimizing corporate environmental policy. Shameek Konar & Cohen (2001) also confirmed the positive relationship between corporate social responsibility and corporate financial performance. Zhang, Liu & Zhang (2009) concluded that the fulfillment of corporate social responsibility (including environmental liability) is not a simple altruism, but a best choice to benefit everyone based on the stakeholder theory. Shi (2013) studied the driving factors for corporate environmental responsibility and confirmed the positive relationship between corporate environmental responsibility and corporate value through empirical approach. Wang & Chen (2011) divided the corporate social responsibility into four dimensions: to customers, employees, environment and charity respectively and found that fulfillment of social responsibility to customers and environment is conducive to corporate performance and value through empirical approach. Jia, Liu & Liao (2016) showed that better fulfillment of corporate social responsibility (including environmental responsibility) is conducive to corporate value raise whether in long term or short term.

In addition, some scholars didn't support such a positive relationship between social responsibility and corporate value. Walsh, Weber & Margolis (2003) considered that the relationship between corporate social responsibility and financial performance is uncertain and very complicated. McWilliams & Siegel (2001) evaluated the corporate performance of social responsibility based on KLD and found no relationship between social responsibility and corporate financial performance. Chinese scholars Fan (2013) took the central listed companies as study samples and discovered a positive correlation between environmental responsibility and corporate value, but not significant. Empirical research of Shao (2009) to Chinese chemical industry indicated that activities of corporate social responsibility (including environmental responsibility) have a negative impact on corporate value.

Study on the correlation between characteristics of top management team and environmental responsibility

Upper Echelons Theory was proposed first by Hambrick & Mason (1984) and had developed into a mature strategic leadership theory by far. The theory indicated that top management team's cognition and value have a great effect on the corporation's decision-making and their cognition and value are closely related to their personal characteristics. Environmental responsibility, as a part of corporate strategy and corporate behavior, will inevitably be affected by the characteristics of top management team. Since Hambrick & Mason (1984) put forward Upper Echelons Theory, a large number of empirical researches had been carried out to study the effect of top management team's characteristics on corporate performance and strategic

decision-making. Thomas & Simerly (1995) first introduced the Upper Echelons Theory to study corporate social responsibility. It is concluded based on an empirical study on top management teams in more than 100 companies in petrochemical and computer industries that the top management team with high production and research experience has a significant positive correlation with fulfillment of social responsibility. Daboub (1995) believed that with the increasing age of top management team, they are increasingly willing to comply with generally accepted social ethical principles and environmental responsibility performance will be better. Goll & Rasheed (2004) found that professional experience of top management team members will affect their perceptions to environmental and unethical behaviors.

Domestic scholars also made sporadic relevant empirical researches. Sun (2009) made an exploration about the correlation between characteristics of top management team and social responsibility via introducing the Upper Echelons Theory and concluded that the greater age, the longer tenure and the higher education level of top management team are conducive to fulfillment of social responsibility, but no empirical test. Zhang (2016) selected the social responsibility report as the indicators evaluating corporate social responsibility performance and found that the greater average age, the higher education level and the more international background of top management team are conducive to fulfillment of social responsibility based on the empirical research. Meng, Zeng, Zhang & Li (2012) established an analytical framework of the correlation between characteristics of top management team and environmental responsibility. Based on the data of listed manufacturing companies in China, they found that a higher proportion of women contribute to fulfillment of corporate environmental responsibility and other demographic characteristics, such as age, tenure, the proportion of technology executives and education level, have not a significant effect on corporate environmental responsibility. Miu (2012) concluded based on an empirical study that the top management team's age, tenure, education, salary and group magnitude have a significant positive effect on fulfillment of social responsibility.

Study on the correlation between characteristics of top management team and corporate value

The current home and domestic researches support the correlation between characteristics of top management team and corporate value. Keck & Tushman (1993) found that whether companies' surrounding is stable, there is always a negative correlation between top management team tenure and corporate performance. However, Foley, Kidder & Powell (2001) indicated that the longer top management team tenure is conducive to team stability and can enhance internal communication, thus it has a positive impact on corporation performance. The

further study of Knight, Pearce, Smith, Sims & Smith (1999) showed that the higher education level of top management team contributes to company's strategic decision and diversified operation. Zhu & Wang (2004) concluded that the employees' age has a negative effect on corporate performance. It means that the companies with relatively small age structure have a better operating performance. There is a positive correlation between top management team member's education background and corporate performance, but a negative correlation between top management team tenure and corporate performance. However Wei & Wang (2002) drew an opposite conclusion through studying on Chinese listed companies. Chen, Zhang & Zeng (2016) studied the impact of characteristics of top management team on corporate performance in state-owned enterprises and private enterprises respectively and found that in state-owned enterprises, there is a positive correlation between top management team member's average age and corporate performance, but a negative correlation between the tenure and corporate performance. But in private enterprises, top management team member's age, tenure and education level positively correlate with corporate performance. Qin (2012) found that in family enterprises, top management team member's education background and tenure have positive correlation with corporate performance, but their age and group magnitude have negative correlation with corporate performance. He & Yang (2010) found that top management team's average education level has a significant positive correlation with corporate value, but top management team magnitude and age have a negative effect on corporate value, in addition, average tenure has nothing to do with corporate value based on the empirical study of GEM listed companies.

Through the above review of the relevant literature, there is no agreed conclusion about the correlation between social responsibility (including environmental responsibility) and corporate value, but the research results of most scholars supported the viewpoint that corporate social responsibility (environmental responsibility) has a positive correlation with corporate value and characteristics of top management team have some impact on corporate environmental responsibility. However, due to the lack of quantitative indicators evaluating domestic corporate environmental responsibility, the study on the correlation between characteristics of top management team and environmental responsibility is also deficient. In the most of existing literature, environmental responsibility was taken as a part of corporate social responsibility to study the correlation between characteristics of top management team and social responsibility, but it didn't reach an agreed conclusion. There is no agreed conclusion about the correlation between characteristics of top management team and corporate value as well.

Most of the existing researches separately discuss the relevance of environmental responsibility and corporate value, the relevance of characteristics of top management team and corporate value and the relevance of top management team and corporate environmental responsibility, while few scholars study whether characteristics of top management team have an effect on the environmental responsibility and corporate value or not. Top management team, as a corporate strategic decision maker, determines the long-term development and organizational performance and has a direct effect on corporate environmental responsibility. Therefore, the present work intends to focus on the characteristics of top management team to study its effect on the relevance of environmental responsibility and corporate value according to managers embeddedness theory.

Theoretical analysis and relevant hypotheses

Ross (1977) proposed Signaling Theory, which thinks that in the dealing process, an obvious information asymmetry exists in both parties of the dealing. That means, when the company delivers a positive message to the market, the market will make a positive response accordingly and the company share price will rise. On the contrary, if a company doesn't disclose relevant information or convey negative information, the market will react negatively, so that the company share price will fall down. Signaling theory can also be employed to analyze the relationship between corporate environmental responsibility and corporate value. With the increasing attention paid to environmental issues, the awareness of environmental protection and sustainable development has enjoyed popular support. Environmental responsibility is both legal and moral responsibility for the corporation. Companies around the world began to raise their corporate environmental responsibility into a strategic height and regard it as an important part of business operation and organizational management. Companies could distinguish themselves from those with bad performance of environmental responsibility only through showing the information of good environmental responsibility to the public. When the corporation conveys the information such as its good development prospect, its sufficient funds and its good performance of environmental responsibility, it will enhance the corporate reputation and help to establish a good image and finally result in the raise of corporate value. Therefore, based on the above theory and literature, the hypotheses were put forward as follows:

H1: Corporate environmental responsibility has a positive correlation with corporate value.

Currently, the corporations still take profit maximization as their primary goal. The fulfillment of corporate environmental responsibility needs to consume plenty of money, manpower and material resources, but its stealth profit is not so noticeable. Therefore, it needs

to get corporate managers high attention. The attention degree of corporate environmental responsibility is subject to an important role-managers, who can basically determine whether to undertake corporate environmental responsibility or not, how to undertake corporate environmental responsibility and how much environmental responsibility to be undertaken. The impact of managers on corporate environmental responsibility must relate to the ability of management. The early researches mainly focus on the characteristics of individual manager and the effect on business decision and corporate performance. However, with the increasing complexity and uncertainty of the external environment, individual manager can't have enough energy to collect and process all information and accurately make the sound judgment and decision. The limitation of individual decision-making arises. So, based on the individual limitation, Hambrick & Mason (1984) firstly proposed the concept of top management team. Compared with the management individual, top management team can effectively make up the lack of individual knowledge, information and ability to improve the quality of decision making, which has a huge advantage. Top management team's characteristics such as experience, personality and value will be made a highly personalized interpretation when facing decision-making. So the top management team's characteristics (including team scale, age, tenure, education and professional background) have a moderating effect on the relationship between environmental responsibility and corporate performance. So hypotheses were put forward as follows:

H2: The scale of top management team positively moderates the positive correlation between environmental responsibility and corporate value.

H3: The age of top management team positively moderates the positive correlation between environmental responsibility and corporate value.

H4: The tenure of top management team positively moderates the positive correlation between environmental responsibility and corporate value.

H5: The education level of top management team positively moderates the positive correlation between environmental responsibility and corporate value.

H6: The professional background of top management team positively moderates the positive correlation between environmental responsibility and corporate value.

RESEARCH METHODOLOGY

Samples and data sources

The study samples are family enterprises whose actual controllers are natural person or families listed in SME board of Shenzhen Stock Exchange in China during 2004-2012. The reason we start from 2004 is that the SME board of Shenzhen Stock Exchange in China is set up in 2004.

Family business is seen as the most dynamic part in Chinese economy. With the expansion of family business scale and the improvement of market economy system, it has an extremely important meaning for Chinese corporations realizing the development of green economy and corporate value to relieve the increasingly prominent contradictions of environmental responsibility exposed in the course of corporate operations. According to "Guideline for Listed Company Industry Classification" issued by China Securities Regulatory Commission, the polluting family enterprises in paper-making industry, textile industry, petrochemical industry, coal and mining industry and metal smelting industry are selected as final samples. The polluting enterprises as the main source of pollution should take on more environment responsibility. The selected research data is in 2013 and the samples are filtered by excluding the companies are in ST and PT category. The final samples are 109 polluting businesses. The data about characteristics of top management team and corporation characteristics involved in the study derived from CSMAR. The missing information is collected manually via Dongfangcaifu Website (<http://www.eastmoney.com/>) and the Shenzhen Stock Exchange website (<http://www.szse.cn/>). Characteristics of top management team are quantified and a quantified indicator is proposed. The indicator measuring corporate environmental responsibility is obtained through content analysis of annual reports of sample companies published in Shenzhen Stock Exchange website (<http://www.szse.cn/>).

Variables definition

Independent variable: corporate environment responsibility

Currently, the quantitative indicators measuring corporate environmental responsibility (CER) are lacked in China. The indicators measuring corporate environmental responsibility in this study is obtained through reviewing the annual reports of sample companies published in Shenzhen Stock Exchange website based on content analysis method. The content analysis method could be decomposed into the following steps: The first step is confirming the list item of evaluation criterion. The second step is judging whether corporate disclosing information contains the evaluating content in the list item. The third step is analyzing the detail level of corporate disclosing information. The criterion list items measuring corporate environmental responsibility refer to the study of Meng (2012) and Fan (2013), combined with the quantized criterion proposed by Wiseman (1982). To be specific, when the disclosing environmental information contains the quantitative description, the list item can get 3 points. When there is no quantitative description, but a detailed qualitative description, the list item gets 2 points. When the qualitative description is not detailed, the list item gets 1 point. When no quantitative and

qualitative description, the list item gets 0 point. The environmental responsibility index of every sample company could be obtained by averaging the scores of eight list items (Table.1).

Table 1. The criterion list items measuring disclosing environmental information

Number	The criterion list items
1	Corporate environmental philosophy and policy
2	Government grants, financial subsidies and tax breaks relating to environmental protection
3	Greening expenses
4	Corporate environmental investment and environmental technology research and development costs
5	Situation of disposal, recycling and utilization of waste products
6	Environmental protection expenses
7	Construction and operation of environmental protection facilities, reduction emissions of pollutants
8	ISO environmental protection system certification, eco-friendly enterprise and other environmental rewards

Measurement for variables

Table 2. Variables definition

	Variable name	Abbr.	Indicator measuring way
Dependent variable	TOBIN'Q	TOBIN'Q	Market value of accounting year-end assets/replacement cost of accounting year-end assets
Independent variable	Corporate environmental responsibility	CER	CER index
Moderating variables (characteristics of top management team)	Group Magnitude	GM	Top management team members
	average age	AGE	Average age(AGE≤30 denoted by 0, 31≤AGE≤40 denoted by 1, 41≤AGE≤50 denoted by 2, 51≤AGE≤60 denoted by 3, AGE≥61 denoted by 4)
	Average tenure	TEN	Average tenure
	average education level	EDUS	Associate degree below denoted by 1, associate degree denoted by 2, bachelor degree denoted by 3, master degree denoted by 4, doctor degree denoted by 5
	Professional background	EDUB	Science and engineering denoted by 1, literature, history and economy denoted by 0
Control variable	Size of company	SIZE	LN(gross assets)
	Asset-liability ratio	LEV	Gross liability / Gross assets
	Share proportion of the largest shareholder	BIG1	Shares of the largest shareholder/gross shares

Model setup

The two steps were conducted to design the test model. Firstly, examining the relationship between environmental responsibility and corporate value, multiple regression of environmental responsibility (CER) and corporate value (TOBIN`Q) is built as model1:

$$TOBIN`Q = \alpha_0 + \alpha_1 CER + \alpha_2 GM + \alpha_3 AGE + \alpha_4 TEN + \alpha_5 EDUS + \alpha_6 EDUB + \alpha_7 SIZE + \alpha_8 LEV + \alpha_9 BIG_1 + \varepsilon \quad (1)$$

Secondly, in order to examine the moderating effect of characteristics of top management team on the correlation between environmental responsibility and corporate value, the cross multiply item $CER*ADJ$ is introduced and the following models 2-6 are built as following:

$$TOBIN`Q = \beta_0 + \beta_1 CER + \beta_2 CER*ADJ + \beta_3 GM + \beta_4 AGE + \beta_5 TEN + \beta_6 EDUS + \beta_7 EDUB + \beta_8 SIZE + \beta_9 LEV + \beta_{10} BIG_1 + \eta \quad (2-6)$$

Where, ADJ stands for GM (model 2), AGE (model 3), TEN (model 4), $EDUS$ (model 5) and $EDUB$ (model 6) respectively.

ANALYSIS AND RESULTS

Descriptive statistics

Table 3. Descriptive statistics for main variables

Index	Minimum	Maximum	Mean	Std. Deviation
TOBIN`Q	0.94	6.13	1.8090	1.02494
CER	0.13	7.31	0.6998	0.17119
GM	4.00	16.00	8.6364	1.96636
AGE	1.50	3.00	2.2302	0.27276
TEN	0.99	7.88	3.2721	1.25087
EDUS	2.05	4.28	3.2885	0.43215
EDUB	0.12	0.62	0.3395	0.13705
SIZE	20.29	24.07	21.6316	0.73801
LEV	0.09	0.83	0.3876	0.17682
BIG1	0.11	0.81	0.3566	0.14678

As can be seen from the results of descriptive statistics (Table 3), the mean value of TOBIN`Q of the sample enterprises is 1.8090 and the mean value of CER is 0.6998, which is relatively close to the findings of Liu & Anbumozhi (2009), Zeng, Xu, Dong & Tam (2010) and Meng (2012). The CER mean value indicates a bad performance of environmental responsibility in Chinese family enterprises. The average age of top management team in the sample enterprises is early 40, which indicates a younger trend of top management team in Chinese family enterprises. Perhaps it is because Chinese family enterprises were founded later or the

young second-generation successors join in some family enterprises. The average tenure is approximately 3.2721, which is shorter. The average value of education level is 3.2885, which indicates the education level of top management team in Chinese family enterprises is still relatively high. The average value of professional background is 0.3566, which indicates most of top management team members have a cultural and historical background. The average value of share proportion of the largest shareholder is 35.66%, which indicates a relatively high ownership concentration in Chinese family enterprises. The average value of asset-liability ratio is 38.76% which indicates a modest liability level in the sample companies.

Regression analysis

Table 4. Regression analysis results for the model of characteristics of top management team, environmental responsibility and corporate value

Index	TOBIN'Q					
	Model1	Model2	Model3	Model4	Model5	Model6
Constant	6.036 (1.96)	-0.060 (-0.068)	-0.009 (-0.105)	-0.002 (-0.023)	-0.040 (-0.454)	0.001 (0.011)
CER	0.114** (2.563)	0.112* (1.698)	0.116* (2.697)	0.135** (2.655)	0.108** (2.560)	0.115** (2.714)
GM	-0.031 (-0.363)	-0.042 (-0.500)	-0.015 (-0.182)	-0.023 (-0.269)	-0.048 (-0.566)	-0.03 (-0.354)
AGE	-0.026 (-0.298)	-0.017 (-0.192)	-0.051 (-0.574)	-0.027 (-0.302)	-0.030 (-0.344)	-0.026 (-0.291)
TEN	0.036 (0.419)	0.029 (0.336)	0.050 (0.589)	0.036 (0.420)	0.045 (0.528)	0.036 (0.418)
EDUS	0.169* (1.721)	0.177* (1.813)	0.161* (1.762)	0.162 (1.642)	0.171* (1.756)	0.170* (1.714)
EDUB	0.07 (0.782)	0.082 (0.907)	0.093 (1.034)	0.073 (0.814)	0.069 (0.775)	0.069 (0.760)
CER*GM		-0.102 (-1.184)				
CER*AGE			-0.153* (-1.744)			
CER*TEN				0.071* (1.762)		

CER*EDUS					0.137 (1.540)	
CER*EDUB						0.005* (1.779)
SIZE	0.23** (3.624)	0.239** (3.727)	0.213** (3.56)	0.241** (3.821)	0.242** (3.836)	0.229** (3.618)
LEV	-0.032 (-0.33)	-0.035 (-0.359)	-0.071 (-0.721)	-0.028 (-0.286)	-0.054 (-0.554)	-0.034 (-0.351)
BIG1	0.158* (1.821)	0.147* (1.684)	0.179** (2.072)	0.161 (1.642)	0.177** (2.036)	-0.160* (1.825)
Adj R ²	0.247	0.251	0.264	0.246	0.258	0.241
F	4.972	4.658	4.911	4.547	4.798	4.455

***. Correlation is significant at the 0.001 level (2-tailed). **. Correlation is significant at the 0.05 level (2-tailed). *. Correlation is significant at the 0.1 level (2-tailed).

Correlation between environmental responsibility and corporate value

As shown in Table 4, corporate environmental responsibility has a positive correlation with corporate value, and their correlation coefficient is 0.114, which is significant at the confidence level of 5%. Thus, we can believe that the better performance of corporate environmental responsibility is conducive to enhance corporate value. This corresponds to the conclusions of most scholars. Considering the relationship between characteristics of top management team and corporate value, only average education level has a positive correlation with corporate value, and it is significant at the confidence level of 10%. The empirical study shows that the higher average education level is conducive to corporate value. For the control variables, there is a significantly negative correlation between corporation size and corporate value, and a significantly positive correlation between BIG1 and corporate value.

Moderating effect of characteristics of top management team

In order to verify the moderating effect of characteristics of top management team, the cross multiply item *CER*ADJ* is introduced. We first to do the centralization for the variables, and then got the cross multiply item of corporate environmental responsibility and characteristics of top management team so as to eliminate the mutual linear problem brought by introducing the cross multiply item.

The regression results of Model 2 are shown in Table 4, the coefficient of cross multiply item *CER * GM* is -0.102, which is contrary to the hypothesis H2, that means the results can't

support the hypothesis H2. However, the coefficient of *CER* is 0.112, which indicates corporate environmental responsibility still has a positive correlation with corporate value.

The regression results of Model 3 are shown in Table 4, the coefficient of cross multiply item *CER*AGE* is -0.153, which is contrary to the hypothesis H3 and is significant at the confidence level of 10%, that means the average age of top management team has a negative moderating effect on the correlation between environmental responsibility and corporate value. So the younger top management team helps to fulfill corporate environmental responsibility, and thus increasing the corporate value. Moreover, the coefficient of *CER* increases into 0.116, which is slightly larger than the coefficient 0.114 in Model1 when the cross multiply item *CER*AGE* is introduced into the regression model. It can be seen that the correlation between environmental responsibility and corporate value increases when the moderating effect of the average age of top management team is added. On the one hand, the reason is many second-generation successors become top management team members in family enterprises at present. Most of young executives have experience to study and exchange in abroad. Their opinions are more avant-garde due to the effect of western values. They tend to pay more attention to corporate environmental responsibility. On the other hand, environment protection becomes the focus issue of the world, especially in China, environment pollution is very serious. The young executives are relatively easy to identify and accept social mainstream ideas and concepts, and more willing to undertake environmental responsibility.

The regression results of Model 4 are shown in Table 4, the coefficient of cross multiply item *CER*TEN* is 0.071 and is significant at the confidence level of 10%, which indicates that the average tenure of top management team has a positive moderating effect on the correlation between environmental responsibility and corporate value. Moreover, the coefficient of *CER* increases into 0.135, which is larger than the coefficient 0.114 of Model1 when the cross multiply item *CER*TEN* is introduced into the regression model. It can be seen that the correlation between environmental responsibility and corporate value increases when the moderating effect of the average tenure of top management team is added. It means the hypothesis H4 passes the significant test.

The regression results of Model 5 are shown in Table 4, the coefficient of cross multiply item *CER *EDUS* is 0.137, which is consistent with the hypothesis H5, but it doesn't pass the significant test. It means the average education level of top management team can't moderate the correlation between environmental responsibility and corporate value.

The regression results of Model 6 are shown in Table 4, the coefficient of cross multiply item *CER *EDUB* is 0.005 and is significant at the confidence level of 10%, which indicates the science and engineering background of top management team has a positive moderating effect

on the correlation between environmental responsibility and corporate value. Moreover, the coefficient of *CER* increases into 0.115, which is slightly larger than the coefficient 0.114 of Model 1 when the cross multiply item *CER*EDUB* is introduced into the regression model. It can be seen that the correlation between environmental responsibility and corporate value increases when the moderating effect of the professional background of top management team is added. It means the hypothesis H6 passes the significant test.

CONCLUSIONS, SUGGESTIONS AND LIMITATIONS

Through theoretical and empirical analysis, the following conclusions are obtained: (1) Corporate environmental responsibility has a positive correlation with corporate value. The good performance of corporate environmental responsibility contributes to convey the information of its good performance in profits and responsibility to the public and establish a good image and thus to raise the stock price. So corporations should actively take their environmental responsibility. (2) The age, tenure and professional background of top management team have moderating effects on the correlation between environmental responsibility and corporate value. It shows the younger members of top management team, the longer tenure and more members with professional background are conducive to bringing more avant-garde values and stronger sense of responsibility, which can promote to fulfill corporate environmental responsibility and thus to increase corporate value. (3) The size of top management team has a positive moderating effect on the correlation between environmental responsibility and corporate value, but it is not significant. This maybe because the values, backgrounds and knowledge experience of top management team members are different. The more members could result in more frictions and conflicts in decision making and it is difficult to make a unanimous decision. (4) The education level of top management team has a positive moderating effect on the correlation between environmental responsibility and corporate value, but not significant. This maybe because the members with high education level tend to stick to their viewpoint and it is bad to make a unanimous decision.

From the perspective of optimizing top management team structure, three suggestions are putted forward: (1) Make top management team younger. The average age of top management team has a negative moderating effect on the correlation between environmental responsibility and corporate value. So, on the premise of ensuring an appropriate proportion of older members in top management team, more avant-garde and talented young executive members should be brought in corporations to inject vigor and vitality for top management team. (2) Enhance the stability of top management team tenure. The average tenure of top management team has a positive moderating effect on the correlation between environmental

responsibility and corporate value. So the frequent replacement of top management team members ought to be avoided as far as possible. On the one hand, the candidate who is willing to devote himself to the corporation should be given more consideration in the recruit for new executive team members. On the other hand, companies should improve the job satisfaction of existing top management team members and reduce separation rate through providing a variety of incentives for them. The longer tenure will improve their loyalty, sense of responsibility and ownership to the corporation, which is good for the long-term development. (3) Increase the proportion of top management team members with professional background. The professional background of top management team has a positive moderating effect on the correlation between environmental responsibility and corporate value. Corporations should bring in some top management team members with science and engineering professional backgrounds. The top management team with widespread professional background will be more sensitive to environmental responsibility in their familiar fields, which is in favor of value transformation of environmental responsibility.

The main limitation of this study is that the indicator measuring corporate environmental responsibility (CER) is collected manually based on the content analysis. There may be some limitations. The further focus can be putted on improving the measurement indicator of corporate environmental responsibility to study the relationship between corporate environmental responsibility, characteristics of top management team and corporate value.

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