

Empirical Study on the Impact of Green Culture on Corporate Financial Risk

Dong Li, Minghua Lin

School of Management, Sichuan University of Science & Engineering, Yibin, Sichuan 644000

Abstract: Based on the perspective of corporate culture, this study takes 464 A-share listed companies in China's heavy pollution industries from 2015 to 2019 as samples. The panel regression model is used to explore the impact of green culture on corporate financial risk and the mediating role of environmental information disclosure. The results show that green culture can significantly reduce corporate financial risk, and environmental information disclosure has a partial mediation effect on the relationship between green culture and corporate financial risk.

Keywords: Green culture; Enterprise financial risk; Environmental information disclosure

1. The introduction

At present, the concept of green development has been fully implemented in China's 14th Five-Year Plan for economic and social development and the outline of the long-term goals for 2035. In this context, the public will pay more attention to environmental protection; And the government will certainly further improve the environmental protection policies and regulations in the future and increase the implementation. Obviously, in the face of the changing external operating environment, it is more and more important for the sustainable development of enterprises, especially heavy polluting enterprises, to actively intervene in environmental protection in the development process.

Corporate green culture is the values and business philosophy of environmental protection and resource utilization that are recognized and followed by enterprises formed in production, operation and management (Zhang et al., 2020). The influence of enterprise green culture on enterprises has attracted the attention of scholars. For example, corporate green culture can improve corporate sales and business performance (Elena et al., 2011), or significantly reduce corporate asset-liability ratio (Blazovich et al., 2013). However, as one of the important factors affecting the enterprise's production and operation, will the enterprise's financial risk be affected by the enterprise's green culture? This study attempts to explore the impact of green culture on the financial risks of listed companies in heavy pollution industries in China.

2. Research hypothesis

2.1 Green culture and corporate financial risk

Corporate culture is a collection of values and codes of conduct jointly owned and observed by the enterprise and its employees, which affects the behavior patterns of internal employees and external stakeholders. Therefore, as an important part of corporate culture, green culture is bound to affect the decision-making behavior of owners, managers and employees. Therefore, hypothesis 1 is proposed:

H1: Green culture can reduce the financial risk of enterprises.

2.2 Mediating role of environmental information disclosure

The specific enterprise culture can promote the formation of a specific cultural environment, promote the formation of a unique cognitive and value concept of employees, and then promote the occurrence of a specific enterprise behavior. According to agency theory, due to the phenomenon of information asymmetry between the two agents, investors mainly rely on the information disclosed by enterprises to predict risks at present. Therefore, environmental information disclosure by enterprises can help investors perceive potential risks of enterprises. Therefore, corporate green culture is highly likely to reduce corporate financial risks by promoting corporate environmental information disclosure. Therefore, hypothesis 2 is proposed:

H2: Environmental information disclosure plays an intermediary role in the impact of green culture on corporate financial risks.

3. Research design

3.1 Sample selection and data sources

This paper takes A-share listed companies in heavy pollution industries listed in Shanghai and Shenzhen from 2015 to 2019 as the research object, with a total of 2320 observation samples. The green culture data and environmental information disclosure data of listed companies are obtained by consulting the company's annual report, social responsibility report and other public documents. Other data are obtained from the CSMAR database.

3.2 Variable selection

3.2.1 Explained variables

The explained variable is enterprise financial risk (Z). Following the practice of Yu et al. (2008), this paper calculates the Z-index of sample companies to measure the financial risk of enterprises. The higher the enterprise Z index is, the lower the enterprise financial risk is. Otherwise, the greater the financial risk of the enterprise.

3.2.2 Explanatory variables

The explanatory variable was green culture(GC).There is no universally accepted measure of corporate green culture.Referring to the methods of Wang and Kan(2014),this study measures the green culture of enterprises from the three levels of organizational system,internal construction and social relations.Among them,the organizational system level is measured by"whether the enterprise has environmental protection concept or environmental protection goal in public documents".If so,the value is 1;otherwise,the value is 0.At the level of internal construction,"Whether the enterprise conducts environmental protection education and training for employees"is used for measurement.If so,the value is 1;otherwise,the value is 0.At the level of social relationship,"whether the enterprise has won environmental honor or reward"is used to measure it.If there is,the value is 1;otherwise,the value is 0.Then,the scores of the above three levels are added as the strength of the enterprise's green culture,so as to measure the enterprise's green culture(GC).

3.2.3 Mediation variables

Environmental information disclosure is measured by"Environmental Information Disclosure Index(EDIS)"to reflect the degree of environmental information disclosure of different enterprises.Calculation of environmental Information Disclosure Index follows Wu et al.(2015).Step1:We assign values to specific measurement indicators of environmental information disclosure.The assignment rules are as follows:2 points for simultaneous quantitative and qualitative disclosure,1 point for only qualitative or quantitative disclosure,and 0 points for no disclosure.Indicators:emergency spending major environmental problems,environmental protection investment spending or borrowing,earnings to reduce pollution,waste utilization,and environmental subsidies,environmental information disclosure system,environmental management goal,the environmental protection measures and improve the situation,through relevant certification of environmental protection and energy saving measures and achievements,the emission standard situation,as well as the social responsibility report or sustainable development report.Step2:The enterprise's environmental information disclosure score(EDI) was obtained by summation of the above 12 indicators.Step3:The environmental information disclosure index(EDIS)was obtained after the relative processing of the environmental information disclosure score(EDI).The calculation formula of environmental information disclosure index is:EDIS=EDI/24*100.

3.2.4 Control variables

Based on the empirical studies of domestic and foreign scholars on influencing factors of enterprise risk,this study takes company Size(Size),financial leverage(Lev),profitability(ROE),ownership concentration(Top5),Board independence(Indratio)and Board Size(Board Size)as control variables,and the measurement indexes of each variable are shown in Table 1.

Table 1 Measurement indexes of control variables

Variable types	The variable name	Variable code	Measurement.
Control variables	The company size	Size	Take the natural log of total assets at the end
	Financial leverage	Lev	Total liabilities/total assets
	profitability	ROE	Average balance of net profit/Stockholders'equity
	Ownership concentration	Top5	Shareholding ratio of the top five shareholders
	Board independence	Indratio	Proportion of independent directors to the board of directors
	Board size	Board	Number of board members

(iii)Model setting

The model is set as follows:

$$Z = \alpha_0 + \alpha_1 GC + \alpha_2 Size + \alpha_3 Lev + \alpha_4 ROE + \alpha_5 Top5 + \alpha_6 Indratio + \alpha_7 Board + \epsilon_1 \quad (1)$$

$$EDIS = \beta_0 + \beta_1 GC + \beta_2 Size + \beta_3 Lev + \beta_4 ROE + \beta_5 Top5 + \beta_6 Indratio + \beta_7 Board + \epsilon_2 \quad (2)$$

$$Z = \gamma_0 + \gamma_1 GC + \gamma_2 EDIS + \gamma_3 Size + \gamma_4 Lev + \gamma_5 ROE + \gamma_6 Top5 + \gamma_7 Indratio + \gamma_8 Board + \epsilon_3 \quad (3)$$

Among them,,respectively represent regression coefficients.IfSignificant,it indicates that there is a significant correlation between green culture and corporate financial risk.IfSignificantly,also significant,indicating the existence of mediating effect.

4. Empirical test and result analysis

4.1 Analysis of regression results

In this paper,panel data model was used for research,and the fixed effect model was found to be more suitable for the model constructed in this paper.Table 2 reports the regression results of each model.

In column(1),the estimated regression coefficient of green culture(GC)on enterprise financial risk(Z)is 2.428,and passes the significance test at 1%confidence level,indicating that green culture has a significant impact on enterprise financial risk.That is,the greater the intensity of green culture is,the lower the financial risk will be,which verifies the H1 hypothesis of this paper.In columns(1) and(2),the coefficient estimation of green culture is positive.In column(3),while the coefficient estimation of environmental information disclosure is positive,the coefficient estimation of green culture is still positive,indicating the existence of a significant mediating effect,and the H2 hypothesis in this paper has been verified.

Table 2 Model regression results

variable	(1) Z	(2) EDIS	(3) Z
GC	2.428*** (3.342)	3.389*** (9.929)	1.823** (2.454)

EDIS			0.178*** (3.614)
Size	13.444*** (8.365)	18.986*** (25.148)	16.829*** (9.069)
Lev	34.706*** (6.192)	11.683*** (4.437)	32.622*** (5.809)
ROE	4.646* (1.783)	2.462** (2.012)	5.085* (1.956)
Top5	18.784* (1.781)	10.664** (2.153)	20.685** (1.966)
Indratio	8.389 (0.524)	8.509 (1.132)	9.907 (0.621)
Board	0.472 (0.691)	0.790** (2.464)	0.613 (0.899)
R squared	0.081	0.316	0.088

4.2 Further analysis:the impact of sub indicators of green culture on enterprise financial risk

Since this paper constructs cultural intensity indicators from the three levels of green culture organization system(gc-os),internal construction(gc-ib)and social relations(gc-sr),how the sub indicators of green culture at each level act on enterprise financial risk is a further problem to be analyzed.In this part,we respectively tested the impact of sub indicators constituting the intensity of green culture on the financial risk of enterprises,and the corresponding results are reported in columns(4)to(6)of table 3.In addition,this paper also tests the common impact of the sub index of green culture intensity on enterprise financial risk,and the regression results are reported in column(7)of table 3.Among the three sub indicators constituting the intensity of enterprise green culture,the organizational system level and internal construction level of green culture have a significant inhibitory effect on enterprise financial risk.

Table 3 Regression results of sub indicators of green culture

variable	(4) Z	(5) Z	(6) Z	(7) Z
GC-OS	3.854*** (3.117)			3.633*** (2.925)
GC-IB		3.266** (2.099)		2.801* (1.781)
GC-SR			1.391 (1.000)	0.710 (0.505)
Size	-13.166*** (-8.242)	-12.758*** (-8.022)	-12.730*** (-7.954)	-13.424*** (-8.346)
Lev	-34.417*** (-6.136)	-35.033*** (-6.240)	-34.979*** (-6.224)	-34.520*** (-6.157)
ROE	4.694* (1.801)	4.550* (1.743)	4.523* (1.731)	4.704* (1.806)
Top5	19.475* (1.845)	18.265* (1.729)	18.178* (1.719)	19.305* (1.830)
Indratio	7.951 (0.497)	8.852 (0.552)	8.238 (0.513)	8.417 (0.526)
Board	0.464 (0.679)	0.505 (0.738)	0.479 (0.700)	0.476(0.698)
R ²	0.081	0.078	0.076	0.082

4.3 Robustness test

In this paper,different methods were used to check the robustness:(1)regression analysis was conducted after removing ST and*ST companies;(2)Considering that some companies do not have green culture,only companies with green culture(GC)samples are used for regression analysis;(3)Change the model research method and adopt OLS regression for regression analysis.The main conclusions remain the same.

5. Conclusion

This study empirically analyzes the impact of green culture on corporate financial risk.The results show that green culture can significantly affect the financial risk of enterprises,and the higher the intensity of green culture is,the lower the level of financial risk is;Environmental information disclosure plays a partially mediating role in the relationship between green culture and corporate financial risk.

The conclusion of this study shows that as an invisible restriction mechanism,enterprise green culture has a certain corporate governance function,and plays an important role in reducing enterprise financial risk and promoting enterprise sustainable development. Therefore,on the one hand,the enterprise management should pay attention to the construction of green culture,create a green cultural atmosphere and establish the concept of green development,so as to achieve the goal of avoiding enterprise financial risks to a certain

extent; On the other hand, the enterprise management should recognize the intermediary effect of environmental information disclosure on the relationship between green culture and enterprise financial risk, so that the enterprise image of green and environmental protection can be transmitted to stakeholders, especially investors and consumers through environmental information disclosure, which will help investors have confidence in the enterprise and improve the enterprise market share, and then have a beneficial impact on the enterprise finance. Finally, it can reduce the financial risk of enterprises.

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