

Does Confucian culture influence corporate green innovation? -- Empirical analysis based on A-share listed companies

Shuang Liang

School of Supervision and Audit Southwest University of Political Science and Law, Yubei, Chongqing, 401120, China

Abstract: Using the data of A-share listed companies from 2010 to 2020 as research samples, this paper empirically analyzes the impact of Chinese Confucian culture on corporate green innovation. The results show that Confucian traditional culture has a significant positive impact on enterprise green innovation. In order to better promote green innovation in enterprises, China should pay attention to the integration of informal institutions and formal institutions.

Keywords: Confucian Culture, Green Innovation, Informal System

1. Introduction

Under the tide of the “double carbon” era, “green transformation” and “green economy” are the hot issues of common concern to all countries in the world today, and they are also important strategies for all countries to gain competitive advantages worldwide in the future. Enterprise is the main body of the market, but also the main body of green innovation, enterprise green innovation vitality is directly related to the overall quality of green economic development, in this context, enterprise green innovation has become a hot topic.

Existing studies have explored the influencing factors of enterprise green innovation from macro and micro levels, but have paid insufficient attention to the role of informal institutions such as Confucian tradition and Confucian business spirit. When formal institutions, such as regulations and policies, fail, informal institutions, such as culture, customs, and cognition, often play a unique and indispensable role. As an important subject of Chinese excellent traditional culture, Confucianism has a subtle influence on the shaping of Chinese people’s code of conduct and spiritual quality, and also affects the business value concept of Chinese entrepreneurs (Chen et al, 2013), and then affects the business decision-making of enterprises.

In this context, the influence of Chinese traditional Confucianism on the green innovation behavior of modern enterprises is thought-provoking. Taking Shanghai-Shenzhen A-share listed companies from 2010 to 2020 as samples, this paper examines the influence of Confucian culture on corporate green innovation.

2. Literature review and research hypothesis

2.1 Institutional background of Confucian traditional culture

Chinese culture has a long history, and Confucian culture has a long history of development. As early as the Spring and Autumn Period, Confucius founded Confucianism, and later through the inheritance and development of Confucian scholars such as Mencius and Xunzi, a set of large-scale and complete ideology with “benevolence, justice, etiquette, wisdom and faith” as the main content was gradually formed.

“Benevolence, justice, propriety, wisdom and trust” is the core concept of Confucius culture, which has a great impact on the management activities of the company, which has been widely recognized by the academic circle. Many scholars believe that Confucian culture has a positive impact on corporate decision-making. Existing literature has found that Confucian ethics can reduce agency costs, alleviate agency conflicts (Wu, 2017), restrain excessive investment (Gu, 2015), restrain encroachment by major shareholders (Lu et al, 20123), promote commercial credit financing of enterprises (Pan et al, 2022), and restrain violations of corporate information disclosure (Zhang and Ke, 2023). In addition, the research also points out that Confucian culture can promote corporate charitable donations (Xu, 2020), relieve employees’ work pressure (Chang et al, 2020), and improve the quality of employees’ rights and interests protection (Gan et al, 2020). Therefore, it is of great theoretical value and practical significance to explore the influence of traditional culture on the behavior and decision-making of modern enterprises from the micro level.

2.2 research hypothesis

Ecological wisdom such as “benevolence for all things” and “harmony between nature and man” advocated in Confucian culture helps enterprises to introduce green management concepts. Compared with other material resources of enterprises, employees are the most dynamic resources in enterprises and have more practical significance in green development(Zhou and Zhang,2019). The Confucian cultural value system contains many ideas that attach importance to employee relationship governance and employee treatment decision-making. Existing literatures have found that Confucian culture can promote corporate green innovation by improving corporate awareness of environmental responsibility and reducing corporate agency problems (Fu and Fan,2023).This paper will discuss the theoretical mechanism of how Confucian culture affects enterprise green innovation from four aspects of Confucian benevolence, justice and benefit, strategy and great harmony.

First, the concept of “people-oriented” emphasizes respect and care for people. On the basis of respect and care, employees will devote themselves to their work, their enthusiasm and innovation ability will be enhanced, and they will be more active in exploring and practicing green innovation, thus promoting the green innovation and development of enterprises.

Second, the concept of justice and profit emphasizes the balance between morality and interest. By adhering to ethical principles, managers can establish a good image and win the trust and support of employees, thereby reducing agency costs, alleviating information asymmetry, reducing risks, and increasing the possibility of managers’ investment in green innovation projects and R&D investment(Zhang and Gu,2015). When the agency cost of enterprises is reduced, it means that enterprises can use more funds for other aspects of development, such as the research and development of green technology, the implementation of environmental protection measures, etc. These investments can promote the green innovation of enterprises.

Third, the “long-term orientation” strategy emphasizes long-term vision and sustainable development. Confucianism advocates a long-term vision and long-term development plan, focusing on the pursuit of sustainable and stable development rather than short-term interests. The Confucian concept of respecting knowledge and talents will improve the human capital level of enterprises. Such human capital investment includes providing training and learning opportunities for employees to enhance their skills and innovation ability, so that enterprises can better cope with the challenges and demands of green innovation, and provide solid talent reserve and intellectual support for green innovation activities.

Finally, the spirit of harmony emphasizes teamwork and common development. Confucianism advocates “peace for eternity”, which is conducive to the establishment of a harmonious atmosphere of organizational interpersonal relations within enterprises.A harmonious corporate atmosphere will help reduce internal conflicts, enhance trust among employees, and promote employee participation in green innovation.

To sum up, this paper proposes the following hypothesis:

H1: When other conditions remain unchanged, Confucian culture is conducive to promoting corporate green innovation.

3. Research Design

3.1 Data source and sample selection

The research object of this paper is the A-share listed companies in Shanghai and Shenzhen from 2010 to 2020. The data mainly comes from the CSMAR database, and the longitude and latitude of the listed companies and Confucian center are collected manually by Confucian culture. The green innovation data comes from the green patent information published by the State Intellectual Property Office.

3.2 Variable Definition

3.2.1 Dependent variable: Green innovation (Green)

Referring to the research of Li Wanhong et al. (2013), this study constructs a continuous variable Green to measure enterprise green innovation, which is equal to the natural logarithm of the number of green patent applications plus 1.

3.2.2 Independent Variable: Confucian Culture (Confu)

Based on the practice of Xu(2019), this paper uses the number of Confucian cultural centers within a 150km radius of the company’s registered address to measure the Confucian cultural.

3.2.3 Control variables

According to the existing literatures on green innovation of enterprises, the following variables are controlled in this paper, including: enterprise Size (Size), financial leverage (Lev), profitability (ROA), return on equity (ROE), ratio of independent directors (Indep) and Dual variables.

3.3 Model Design

In order to test the impact of anti-corruption on enterprise green innovation, this paper constructs model (1) to test hypothesis H1:

$$\text{Green} = \alpha_0 + \alpha_1 \text{Confu} + \alpha_2 \text{Controls} + \varepsilon \quad (1)$$

Among them, Green is the green innovation of the explained variable; Confu is the explanatory variable of Confucian culture; Controls indicates control variables; ε represents the random error term.

4. Empirical analysis

4.1 Correlation Analysis

Before regression analysis, this paper first conducted correlation analysis on major variables, and the specific results are shown in Table 3. As can be seen from the table, the correlation coefficient between Confucian culture and green innovation is 0.023, and is significantly positive at 1% level, which initially indicates that the regression model constructed in this paper is reasonable.

Table1:Correlation analysis.

| variable | Green | Confu | Size | Lev | ROA | ROE | Indep | Dual |
|----------|-----------|-----------|-----------|-----------|-----------|-----------|----------|-------|
| Green | 1.000 | | | | | | | |
| Confu | 0.023*** | 1.000 | | | | | | |
| Size | 0.407*** | -0.098*** | 1.000 | | | | | |
| Lev | 0.196*** | -0.089*** | 0.537*** | 1.000 | | | | |
| ROA | -0.025*** | 0.083*** | -0.055*** | -0.382*** | 1.000 | | | |
| ROE | 0.028*** | 0.064*** | 0.085*** | -0.186*** | 0.885*** | 1.000 | | |
| Indep | 0.031*** | -0.016** | 0.009 | -0.007 | -0.024*** | -0.027*** | 1.000 | |
| Dual | -0.031*** | 0.083*** | -0.182*** | -0.151*** | 0.066*** | 0.028*** | 0.102*** | 1.000 |

*** p<0.01, ** p<0.05, * p<0.1

4.2 Analysis of benchmark regression results

The influence of Confucian culture on enterprise green innovation is shown in Table 4. Among them, only Confucian culture (Confu) is included in column (1), and its coefficient is significantly positive at the 1% level, indicating that Confucian culture can significantly promote corporate green innovation. When relevant control variables are added to column (2), the coefficient is still significantly positive at the level of 1%. The results show that Confucian culture can indeed significantly promote enterprise green innovation, and hypothesis 1 is verified.

Table2:Baseline regression results.

| variable | (1) | (2) |
|----------|----------------------|-----------------------|
| | Green | Green |
| Confu | 0.255*** (0.0756) | 0.692*** (0.0695) |
| Size | | 0.380*** (0.00655) |
| Lev | | -0.191*** (0.0450) |
| ROA | | -0.266 (0.282) |
| ROE | | -0.0723 (0.132) |
| Indep | | 0.496*** (0.131) |

| | | |
|--------------|----------------------|-----------------------|
| Dual | | 0.0941*** (0.0162) |
| Constant | 0.703*** (0.0157) | -7.908*** (0.145) |
| Industry FE | YES | YES |
| Year FE | YES | YES |
| Observations | 21,900 | 21,900 |
| R-squared | 0.001 | 0.173 |

5. Concluding Remarks

The empirical results of this paper show that the traditional Confucian culture has a positive role in promoting the green innovation of enterprises, and provides profound spiritual motivation and cultural support for enterprises. Enterprises should actively use the power of Confucian culture to promote green economic transformation. However, the influence of Confucian culture on enterprise green innovation is restricted by many factors, and its deep influence mechanism needs to be further studied and discussed.

References

- [1]Chen,D.H., Hu,X.L., Liang,S.K.,Xin,F. Religious tradition and corporate governance. *Economic Research*,2013,9 :71-84.
- [2]Wu,Y. Cultural confidence and cultural governance: The contemporary function of traditional Confucian Ethics [J]. *Learning and Practice*,2017,(05):118-123.
- [3]Gu Z.H. Confucian Ethics and agency Costs in the Context of Globalization [J]. *Management World*,2015(03):113-123.
- [4]Lu,H.L., Ma,Z., Xu,X.Y. Confucian culture, Internal control and business credit financing [J]. *Economics and Management Review*,2019,39(02):83-94.
- [5]Pan,Z.C., YI,Z.H., Bai,S.H.. Can Confucian Culture curb corporate information disclosure violations? [J]. *Journal of Management*,2022,35(01):102-123.
- [6]Zhang,X., Ke,S.X.. The Invisible Power: Confucian culture and Enterprise Labor investment Efficiency[J]. *Friends of Accounting*,2023(15):11-18.
- [7]Xu,X.X., Long,Z.N., Li Wanli. Confucian Culture and corporate charitable Donation[J]. *Foreign Economics and Management*, 2019,42(02):124-136.
- [8]Chang,S.C., Chen,C.H., Chao,G,et al. Study on the mechanism of Confucian culture in relieving work stress [J]. *Foreign Economics and Management*, 2019,42(05):105-120.
- [9]Gan,W.Y., XU,X.X., LIU,M. Confucian tradition and Employee Employment Security: the power of Culture[J]. *Journal of Shanghai University of Finance and Economics*, 2019,22(01):66-84.
- [10]Zhou,W.B., ZHANG,R.Z.. Research on employee Green Management under the concept of green development [J]. *Journal of Theory*,2019(06):59-67.
- [11]Zhang,G., Zhang,X.J. The relationship between green innovation strategy and firm performance: taking employee participation as the mediating variable.[J]*Research of Finance and Trade*,2013,24(04):132-140.
- [12]Fu,J.W.J.,Fan,D. Can environmental information disclosure motivate enterprises' green technology innovation? Evidence from Chinese listed companies[J].*Industrial Economics Review*,2023(02):150-166.
- [13]Zhang,G.G., Gu,X.Y.. Mean thinking and employee creativity[J].*Scientific Research Management*,2015,36:251-257.
- [14]Li,W.H., Bi,K.X.,Cao,X.. The impact of environmental regulation tools on green technology innovation of Manufacturing enterprises: A case study of paper and paper products enterprises [J]. *Systems Engineering*,2013,31(10):112-122.
- [15]Xu,X.X., Li,W.L..Confucian Tradition and Enterprise Innovation: the Power of Culture[J]. *Financial Research*,2019(09):112-130.