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Effect of Regional Cultural Diversity in Senior Executives on Environmental Protection Investment

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Abstract: With the increase in the seriousness of environmental issues and investors' increasing concern for corporate environmental performance, more and more scholars are paying attention to the impact of executive diversification on corporate investment decisions. This study empirically examines the impact of regional cultural diversity in executive teams on corporate environmental investment and its moderating effect on different industries and regions, using companies listed in China from 2009 to 2019 as research samples, from the perspective of informal cultural systems. The research results indicate that: regional cultural diversity in executive teams can significantly promote corporate environmental investment; regional cultural diversity in executives is more conducive to increasing environmental investment in competitive industries, while the promotion effect of environmental protection investment in monopolistic industries is not significant; and diversity in regional culture in top management teams is more conducive to the promotion of environmental investment by coastal enterprises, while the promotion of environmental investment by non-coastal enterprises is not significant.

Keywords: corporate governance; regional cultural diversity; sustainable development

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1. Introduction

China has become the world's second largest economy due to its rapid development, but the country is facing significant environmental challenges due to the disharmony between economic growth and environmental protection. These challenges have become increasingly apparent in recent years. According to the 2018 Global Environmental Performance Index Report, China's ranking is 120th out of more than 180 countries. This ranking illustrates China's achievements in environmental protection, while also revealing the challenges and tasks that still need to be faced. Although certain achievements have been achieved, efforts still need to be continued, as China's path to environmental protection is still long and difficult. Although China's investment in environmental protection is receiving increasing attention from various sources, there is still a certain gap between the speed of environmental governance and the speed of environmental pollution. Additionally, the investment structure for environmental governance needs to be optimized, with a particular focus on the backward growth rate and the proportion of investment in industrial pollution source control. Moreover, in the past, the inclusive growth theory believed that for economically developing countries or regions, economic growth could be driven by tolerating certain environmental pollution. Today, the severity of damage to the natural environment has reached an acceptable tolerance boundary, and environmental issues have become an important factor affecting people's safety and enterprise survival. In the GDP-oriented economic development model, the self-interest behavior of enterprises and the public goods attributes of the environment have led to environmental pollution problems. The investment in pollution source control is relatively independent of local fiscal expenditure on environmental protection, and most of the funds needed are

obtained from enterprises rather than the government. A top management team (TMT)'s exceptional standing in a company results in their irreplaceable function in determining the organization's environmental investment decisions. This has generated widespread interest in both academic and practical circles. The TMT is the most influential group in a company, and its actions significantly impact the enterprise's behavior. According to upper echelon theory, a company's actions are determined by the awareness of its top management team, and strategic decisions can be viewed as a "reflection" of the characteristics of this team [1]. Characteristics such as team size, senior management age, and financial and overseas backgrounds can influence the risk preference, psychological qualities, and personal cognition of senior executives. These factors, in turn, affect the decision-making process of the top management team. Additionally, the TMT's recognition of investment strategy information and investment preferences can significantly influence enterprise investment decisions. Thus, to optimize the business outcomes of the enterprise, it is crucial to consider the collective traits of the top management team. Culture influences individual decision-making and corporate economic behavior. Culture exerts a subtle influence on corporate financial behavior by embedding the cognitive concepts and behavior of executives in the decision-making process.

Although the existing research on executives' culture is more concentrated on the beneficial impact of cultural similarity and cultural identity on the unity of corporate decision-making, the internal cultural circle established between similar groups of executives will also lead to the exclusion of external groups, and will limit the value concept and behavior cognition of enterprises, which is not conducive to the establishment of a more open and diversified corporate governance mechanism. The composition of a diversified top management team is linked to enterprise performance [2]. A diverse team comprising members from various cultural backgrounds can lead to improved performance levels by leveraging the benefits of cultural differences [3]. Additionally, China has vast geographical conditions and a rich and diverse regional culture. In the context of cross-regional culture, the heterogeneous values, intrinsic motivations, and behavioral preferences of top management team members will increase the complexity of collective decision-making. Further research is needed on the influence of cultural diversity among executives on environmental investment decisions made by companies, especially in situations of high uncertainty and substantial capital investment. Given the need for the further strengthening of environmental investment by Chinese enterprises and the controversy surrounding the diversification of corporate executives, the purpose of this study is to explore the impact of the regional cultural diversity of executive teams on corporate environmental investment from the perspective of informal cultural systems. Thus, empirical research is conducted using samples of all A-share companies listed in the Guotai An database from 2009 to 2019, to analyze the impact of regional cultural diversity in the top management team on corporate environmental investment, as well as its regulatory effect on various industries and regions. The results show that regional cultural diversity in the top management team can significantly promote the environmental protection investment of enterprises; the influence of regional cultural diversity in senior executives on the environmental protection investment of enterprises in different industries and regions is characterized by heterogeneity; regional cultural diversity in senior executives is more conducive to an increase in environmental protection investment in competitive industries, while the promotion of environmental protection investment in monopoly industries is not significant; and diversity in regional culture in the top management team is more conducive to promoting an increase in environmental protection investment in enterprises in coastal areas, while the promotion of environmental protection investment in enterprises in non-coastal areas is not significant. As a result, when hiring and recruiting managers and employees, enterprises should prioritize those with diverse metacultural backgrounds and leverage the beneficial aspects of multiculturalism in promoting investments toward environmental protection. Enterprises with different regions and different degrees of competition should reasonably configure the composition of management teams according to their own needs and charac-

teristics. This article is divided into seven parts: the first part is the introduction, which mainly introduces the research background and problem posed in this article; the second part is the literature review, which summarizes existing research on the determinants of corporate environmental investment, the theory of high-level echelons, and the impact of cultural diversity among executives; the third part presents the research hypotheses; the fourth part describes the research and design; the fifth details our analysis of the empirical results; the sixth part describes our cross-sectional analysis; and the seventh part presents our conclusions and provides corresponding policy recommendations.

2. Literature Review

Environmental investment has become a strategic choice for more and more companies because most business managers have a positive attitude towards social responsibility, Environmental investment has become a strategic choice for more and more companies [4]. However, the performance of different companies in environmental investment varies. Some companies invest heavily in environmental protection, while others lack sufficient investment in environmental protection. The decision-making of executives is one of the key factors in a company's environmental investment. Therefore, this article explores which executive characteristics have an impact on environmental investment through a comprehensive literature search. Gender is one of the factors that affects executive environmental investment decisions. Female executives are more inclined to invest in environmental protection. A study of American companies found that environmental investment is more common in companies with female executives than in companies without female executives [5]. This may be because women are more concerned about social responsibility and sustainable development. In another study, researchers found that when the proportion of female executives in a company is higher, the company's environmental performance is also better [6,7]. These research results indicate that gender is one of the important factors affecting executive environmental investment decisions. Age is another factor that affects executives' environmental investment decisions. A study of British companies found that older executives are more inclined to invest in environmental protection [8]. This may be because they are more concerned about the long-term interests of the company, while environmental investment can create long-term social value for the company. In another study, researchers found that older executives in public companies in the United States were more proactive in environmental investment [9]. These research results indicate that the age of executives is closely related to their decision-making on environmental investment. The educational background of executives can also affect decision-making regarding environmental investment. Executives with an environmental background are more inclined to invest in environmental protection. A study on Chinese companies found that executives with environmental backgrounds are more likely to drive environmental investment [10]. In addition, a study found that executives with an MBA degree are more concerned about environmental issues [11]. These research results indicate that the educational background of executives can affect their decision-making regarding environmental investment. The experience of executives can also affect decision-making regarding environmental investment. Executives with experience in the field of environmental protection are more inclined to invest in environmental protection. A study on American companies found that executives with experience in the field of environmental protection are more inclined to invest in environmental protection [12]. This may be because they have a better understanding of environmental issues and are more confident and capable of promoting environmental investment. In another study, researchers found that executives with a background in public utility management were more willing to take environmental measures [13]. These research results indicate that the experience of executives has a significant impact on environmental investment decisions. Emotional intelligence is another factor that affects executive environmental investment decisions. Research has shown that emotional intelligence has a positive impact on environmental performance, which is achieved through two mediating variables: job satisfaction and

organizational commitment. In addition, the study also found that personal and job characteristics have a moderating effect on the relationship between emotional intelligence and environmental performance [14]. In summary, executive characteristics are one of the important factors affecting a company's environmental investment. The gender, age, educational background, experience, and emotional intelligence of executives can all have an impact on environmental investment. Environmental investment can not only enhance a company's social responsibility and sustainable development, but can also create economic value for the company and improve its financial performance. Therefore, companies should focus on the environmental investment decisions of executives and consider environmental investment as an economic behavior to achieve sustainable development.

In addition to the aforementioned influencing factors, the culture of executives can also have an impact on corporate environmental investment, but most existing research focuses on exploring the impact of a single culture on corporate environmental investment. Firstly, executives of a single culture may affect a company's environmental investment decisions. Some studies have shown that the cultural background of executives can affect their understanding of and emphasis on corporate social responsibility. For example, executives in China and Japan are more focused on long-term corporate interests and tend to combine corporate social responsibility with long-term corporate interests, so they may be more cautious about investing in environmental protection. On the contrary, in some European and American countries, executives pay more attention to the short-term interests of enterprises, and they may be more inclined to pursue short-term economic benefits, while not paying enough attention to environmental investment [15]. Secondly, executives of a single culture may affect a company's attitude toward and perception of environmental issues. Some studies have shown that the cultural background of a company is closely related to its environmental behavior. For example, companies in China and Japan focus on stable and sustainable development, and therefore, tend to make long-term environmental investments. On the contrary, companies in European and American countries focus on rapid development and innovation, and may be more inclined to engage in technological innovation and the introduction of environmentally friendly technologies than make long-term environmental investments [16]. Thirdly, executives of a single culture may also affect a company's risk appetite. Some studies have shown that the cultural background of executives is closely related to their perceptions of and attitudes toward risk. For example, executives in China and Japan place more emphasis on risk control, so they may be more cautious about investing in environmental protection. On the contrary, in some European and American countries, executives are more inclined to take on higher risks [17]. Finally, executives of a single culture may also affect communication and cooperation between companies and stakeholders. In some cultures, the relationship between enterprises and stakeholders is very important. For example, in China and Japan, companies have very close relationships with the government, customers, and employees, and these stakeholders have a great influence on their decision-making. Therefore, if there is a significant difference between the cultural background of a company's executives and stakeholders, it may affect communication and cooperation between the company and stakeholders, thereby affecting environmental investment [18].

Few studies have explored the impact of multiculturalism on corporate environmental investment. Some studies have shown that multicultural executives have a broader perspective and more open thinking, and can better recognize the necessity of environmental investment, thereby promoting enterprises to invest in environmental protection. For example, Chen suggest that executives with overseas experience in China are more inclined to invest in environmental protection, possibly because they have a better understanding of international environmental standards and regulations [19]. In addition, multicultural executives can better understand the environmental standards and regulations of different countries and regions, thus developing more feasible environmental strategies. These studies indicate that multiculturalism also has a significant impact on corporate environmental investment [19,20].

Given that existing research mostly focuses on exploring the impact of a single culture on corporate environmental investment, there is still a research gap regarding the impact of diverse regional cultures in executives on corporate environmental investment. Therefore, this article investigates the impact of executive cultural diversity on corporate environmental investment. This article selects all A-share companies listed in the Guotai An database from 2009 to 2019 as samples, and conducts empirical research to analyze the impact of regional cultural diversity in executive teams on corporate environmental investment and its moderating effect on different industries and regions, in order to fully understand the role of executive multiculturalism in corporate environmental investment.

3. Theoretical Logic Construction

As an informal system, regional culture will have a certain impact on the behavior of individuals and enterprises in the region [21], which means that enterprise managers from different regions have obvious regional cultural characteristics. A theoretical framework will be developed in this section to explore the influence of executives' regional cultural diversity on corporate investment in environmental protection, including cross-sectional analysis and other related factors.

3.1. The Effect and Mechanism of Regional Cultural Diversity in Senior Executives on Environmental Protection Investment of Enterprises

General research suggests that cultural differences will lead to barriers of trust between the two cultures and that it is difficult to form common values, leading to the deepening of potential cultural contradictions, thus increasing the management costs of enterprise operation [22–24]. However, as a complex economic activity in enterprises, environmental protection investment needs top management team members to brainstorm and integrate various resources in order to be more conducive to the development of environmental protection investment activities [25,26].

First of all, multiculturalism can play a role in improving environmental protection investment by curbing the short-sighted behavior of managerial teams. The nature of environmental investment has the characteristics of long cycle and uncertainty, requiring managers to adopt a long-term strategic perspective and carefully plan when evaluating the potential benefits of investing in environmental projects for the company's future success [27–29]. Nonetheless, managers could be dismissed or substituted by shareholders with the intention of enhancing the company's operational efficiency [30]. For senior executives, being dismissed or replaced could lead to losing their current position, status, and could reduce their salary and benefits, and thus, they may be motivated to take actions that serve their own interests to reduce their risk of being fired, replaced, taken over, or merged, and to solidify their current position and status [31]. The introduction of diversified enterprise management can mitigate managerial myopia and foster better investments in environmental protection by companies. One benefit of having a management team with multicultural characteristics is that it can provide more diverse information during the M&A decision-making process, thus reducing information asymmetry [32,33]. Additionally, managers from different cultural backgrounds can complement each other's knowledge and reduce the risk of short-sighted behavior in environmental protection investment decision-making. Implementing this can lead to sustained growth and progress for the company.

Secondly, diversity in the top management team's culture can enhance the internal control effectiveness of the enterprise and create a favorable environment for environmental investment. Members from the same region tend to have a shared culture, philosophy, and way of doing things, which may lead to a "friendly" relationship, "group thinking", and support for each other's decisions [34]. However, members of a management team with multicultural backgrounds tend to be more rational in enterprise decision-making, monitor each other more effectively, and improve the level of internal control. Improved quality of corporate information disclosure and reduced internal and external information

asymmetry risks can be achieved through the implementation of effective measures [35,36]. Moreover, diverse ideas can boost the team's capacity to anticipate and solve problems [37]. When dealing with uncontrollable factors such as market conditions, a top management team can employ varied judgments and solutions, which, in turn, can enhance the overall control of the organization.

Thirdly, cultural diversity in the top management team can ease the financing constraints of environmental protection investment by increasing financing channels. Investing in enterprise environmental protection requires a substantial capital investment that must be made over an extended period. As a carrier of resource flow, the rich interpersonal relationships of the top management team can bring a variety of social networks for enterprise financing [38,39]. A management team that is more diverse can offer a wider range of financing channels and resources to companies, enabling them to better meet their capital requirements and alleviate financing restrictions. This, in turn, can facilitate increased investment in environmental protection by companies [40]. Based on the above analysis, this paper proposes the following assumptions:

Hypothesis 1 (H1). *Regional cultural diversity in top management teams can promote the environmental protection investment of enterprises.*

3.2. Cross-Sectional Analysis of Regional Cultural Diversity of Senior Executives

Although China is not a country of immigrants, it has a vast territory. Different places have different natural and geographical conditions, as well as different social development tracks and historical traditions, thus forming a rich and varied regional culture. Different regions have different tolerances and needs for cultural differences, so the effects of their promotion of environmental protection investment also differ. The environment where an enterprise is located has an important impact on the ability of regional cultural diversity in senior executives to promote environmental protection investment.

There are great differences between the regional cultures nurtured by coastal areas and non-coastal areas. In the development of the marine economy, while taking advantage of the advantages of the seaport to develop shipbuilding, navigation, fishing, and other undertakings, people must also face the test of the ocean's sometimes harsh climate, so the coastal areas with a marine economy and culture have a relatively obvious spirit of adventure [41]. In addition, as gateways that have enabled access to the wider world since ancient times, coastal areas offer more opportunities for foreign economic exchange and trade. On the one hand, this gives coastal areas a first-mover advantage in acquiring advanced international concepts and technologies; on the other hand, people living in coastal areas have a strong tolerance for different cultures, making it easier to overcome the cultural identity effect between "inner groups" and quickly establish contact with "outer groups". This improves their capability for understanding the diverse information required for the environmental protection investment of enterprises. As a result, a diverse top management team operating within an open and inclusive marine cultural environment along coastal areas may be more inclined to adopt aggressive and proactive strategies for investing in environmental protection, which could lead to higher performance in terms of their environmental protection investments. Compared with coastal areas affected by marine economy and culture, the culture of inland areas may be relatively conservative, and the cultural identity effect between "inner groups" is stronger, which, to some extent, inhibits the incentive effect of cultural diversity in executives on environmental protection investment. Therefore, this paper puts forward the following assumptions:

Hypothesis 2 (H2). *Regional cultural diversity in top management teams can better enhance the environmental protection investment of enterprises in coastal provinces.*

In the modern business environment, enterprises need to constantly adapt to the changing market and consumer needs, and also meet the requirements of government

supervision and social responsibility for enterprises. This requires enterprises to make efforts in all aspects, especially in environmental protection. However, the high cost of environmental protection investment may affect the short-term profits of enterprises, which is often unacceptable to enterprises in a highly competitive market. Therefore, for enterprises, achieving environmental protection investment while ensuring short-term profits is an important issue.

The literature reveals that greater regional cultural diversity within a company's top management team can be beneficial for driving investments in environmental protection, particularly in highly competitive industries. This is because in industries with higher competition, to achieve the sustainable development, enterprises need a higher sense of social responsibility to meet the expectations of consumers and the government [42]. A diversified top management team can bring a broader perspective and ideas, which can help enterprises better understand the concerns and expectations of consumers and the government on environmental protection issues, thus promoting the implementation of environmental protection investment [43]. On the contrary, in industries with a low level of competition, enterprises are more likely to be free from pressure from consumers and the government, and may lack the motivation to invest in environmental protection.

In addition, diversity in top management teams also helps enterprises obtain the support of employees and external stakeholders when implementing environmental investment [44]. Studies indicate that cultivating a corporate social identity can boost employees' sense of attachment and motivation, as well as enable companies to establish a positive image, thereby establishing a firm foundation for sustainable growth. In highly competitive industries, the implementation of environmental protection investment needs the internal and external cooperation of enterprises, and the existence of multiple top management teams can help enterprises establish a broader social network, so as to better achieve the environmental protection objectives. Therefore, this paper puts forward the following assumptions:

Hypothesis 3 (H3). *Regional cultural diversity in top management teams can better enhance the environmental protection investment of enterprises in competitive industries.*

4. Research Design

4.1. Sample Selection and Data Source

In this paper, we selected all A-share companies listed in the Guotai An database from 2009 to 2019 as samples and carried out screening, excluding the following: (1) ST and *ST listed companies; (2) financial listed companies; (3) samples for which the personal characteristics of the senior executives of listed companies could not be identified and financial information was missing. Information about the nature of the ultimate controller of enterprises was obtained from the iFinD database, and financial and governance data for other companies were obtained from the CSMAR series of research databases. In order to eliminate the influence of extreme values, we shrunk the tail of the quantiles of continuous variables to below 1% and above 99%.

4.2. Research Models and Variables

To test the impact of regional cultural heterogeneity in senior executives on environmental protection investment, we built the following model:

$$\begin{aligned} EnvInv_{it} &= \alpha + \beta_1 Hete_{it} + \beta_2 Size_{it} + \beta_3 ROA_{it} + \beta_4 Lev_{it} \\ &+ \beta_5 FCF_{it} + \beta_6 Growth_{it} + \beta_7 Dual_{it} + \beta_8 Board_{it} + \beta_9 Inde_{it} \\ &+ \beta_{10} Fem_{it} + \beta_{11} Conc_{it} + Year + Indus + \varepsilon \end{aligned} \quad (1)$$

where EnvInv refers to the investment made by enterprises in environmental protection. To measure EnvInv, we adopted a method used in previous studies [45] that measures the ratio of environmental protection investment to the total assets of listed companies in

the current year. Hete represents the Hofindahl index of top management team members from different provinces each year. We focused on this index, and the higher it is, the lower the regional cultural heterogeneity of the top management team is. If the coefficient of the executives' regional cultural heterogeneity is significant, it suggests that a causal relationship between the regional cultural heterogeneity of executives and environmental protection investment is established to some extent.

$$Hete = 1 - \sum_{i=1}^{n} P_i^2 \quad (2)$$

At the same time, the model also controls the company size, solvency, operating cash flow, growth, profitability, two-value integration, equity concentration, board size, board independence, number of female directors, equity concentration, and industry and annual dummy variables (See Table 1 for specific definitions and calculations). In order to eliminate the possible bias caused by autocorrelation and heteroscedasticity in the model setting, the cluster robust standard error was determined at the company level.

Table 1. Variable definitions.

Variable Type	Variable Name	Variable Symbol	Variable Definition
Interpreted variable	Environmental protection investment	EnvInv	Total environmental protection investment/total assets
Explanatory variable	Regional cultural heterogeneity of senior executives	Hete	The sum of the squares of the number of directors in each province
Control variable	Company size	Size	The natural logarithm of the company's total assets
	Solvency	Lev	Total liabilities at the end of the year/total assets at the end of the year
	Operating cash flow	Cash	Net operating cash flow/total assets at the end of the year
	Profitability	ROA	Net profit/total assets
	Growth ability	Growth	(Operating income of the current year-operating income of the previous year)/operating income of the previous year
	Integration of two positions	Dual	If the chairman and general manager are the same person, the value is 1; otherwise, it is 0
	Equity concentration	Conc	Shareholding ratio of the largest shareholder
	Board size	Direct	Number of directors
	Independence of the board of directors	Inde	Number of independent directors/number of directors
	Proportion of female directors	Age	Number of female directors/number of directors
	Industry	Indus	Industry dummy variable
	Year	Year	Year dummy variable

5. Analysis of Empirical Results

5.1. Descriptive Statistics

Table 2 reports the descriptive statistical results of the main variables. The average value of environmental protection investment (EnvInv) is 0.0931, and the standard deviation is 0.252. In terms of control variables, the average value of Size is 22.06, the average value of ROA is 0.0363, the average value of Lev is about 43%, the average value of FCF is about 4.63%, and the average value of enterprise growth is 0205. The average values of Dual, Board, Inde, Fem, and Conc are 0.273, 8.632, 0.374, 0.142, and 0.165, respectively, indicating that most of the listed companies in the sample are characterized by separation of the powers of the chairman and the general manager, and the concentration of the largest shareholder's equity. About four of the members of the board of directors become independent directors.

Table 2. Descriptive statistics.

Variable	N	Mean	SD	Min	p50	Max
EnvInv	32,400	0.0931	0.252	0	0.1	0.1
Hete	32,400	0.128	0.0531	0	0.122	0.523
Size	32,400	22.06	1.310	19.50	21.88	26.09
ROA	32,400	0.0363	0.0684	−0.327	0.0380	0.197
Lev	32,400	0.429	0.216	0.0495	0.420	0.965
FCF	32,400	0.0463	0.0723	−0.184	0.0464	0.246
Growth	32,400	0.205	0.402	−0.353	0.0989	2.418
Dual	32,400	0.273	0.446	0	0	1
Board	32,400	8.632	1.710	5	9	15
Inde	32,400	0.374	0.0533	0.313	0.333	0.571
Fem	32,400	0.142	0.128	0	0.111	0.538
Conc	32,400	0.165	0.116	0.0150	0.137	0.563

5.2. Benchmark Regression Results

In order to estimate the impact of regional cultural diversity in senior executives on environmental protection investment, this paper used model (1). Table 3 reports the test results of hypothesis H1. Column (1) shows the OLS test results of uncontrolled years, the industry effects, and variables without a control; column (2) shows the OLS test results of controlled years and industry effects, but without control variables; and column (3) shows the OLS test results of all the control variables. The results show that the coefficient of Hete is significantly positive whether all the control variables or some of the control variables are added, which indicates that diversity of regional culture in senior executives significantly improves investment in environmental protection. We assume that H1 is verified.

5.3. Robustness Test

5.3.1. Replacement of Variables

We took the ratio of the number of provinces and the number of top management teams as an alternative indicator of the regional cultural diversity of senior managers and re-examined it. Column (3) of Table 4 reports the test results using the replacement of explanatory variables. The results show that after changing the measurement method of regional cultural diversity, the coefficients of Hete are significantly positive, indicating that the empirical conclusion of the promotion of environmental protection investment by regional cultural diversity in senior executives remains unchanged.

Table 3. The impact of regional cultural heterogeneity in senior executives on environmental protection investment.

	(1)	(2)	(3)
	EnvInv	**EnvInv**	**EnvInv**
Hete	0.3507 ***	0.3205 ***	0.1536 ***
	(14.3272)	(13.1398)	(6.2348)
Size			−0.0321 ***
			(−28.4327)
ROA			−0.0052 **
			(−2.5573)
Lev			−0.0032 ***
			(−3.2797)
FCF			−0.0590 ***
			(−4.1802)
Growth			0.0091 ***
			(4.9242)
Dual			0.0098 ***
			(3.3075)
Board			−0.0054 ***
			(−5.9478)
Inde			−0.0557 **
			(−2.1126)
Fem			0.0052
			(0.5161)
Conc			−0.0468 ***
			(−4.1193)
_cons	0.8964 ***	0.9488 ***	1.7304 ***
	(264.7635)	(74.0323)	(61.1047)
Year FE	No	Yes	Yes
Industry FE	No	Yes	Yes
N	32,377	32,377	31,910
r2_a	0.0063	0.0355	0.0735

Note: ** indicates significant at the 5% level, and *** indicates significant at the 1% level.

Table 4. Alternative indicators of regional cultural heterogeneity in senior executives.

	(1)	(2)	(3)
	EnvInv	**EnvInv**	**EnvInv**
Hete2	0.0790 ***	0.0553 ***	0.0176 **
	(11.2778)	(7.8256)	(2.3991)
Size			−0.0328 ***
			(−29.1638)
ROA			−0.0050 **
			(−2.4529)
Lev			−0.0031 ***
			(−3.2328)
FCF			−0.0595 ***
			(−4.2189)
Growth			0.0087 ***
			(4.8422)
Dual			0.0111 ***
			(3.7646)
Board			−0.0055 ***
			(−6.1459)
Inde			−0.0585 **
			(−2.2208)
Fem			0.0028
			(0.2705)
Conc			−0.0482 ***
			(−4.2479)
_cons	0.9244 ***	0.9814 ***	1.7565 ***
	(466.7364)	(78.7967)	(63.4528)
Year FE	No	Yes	Yes
Industry FE	No	Yes	Yes
N	32,423	32,423	31,940
r2_a	0.0039	0.0321	0.0725

Note: ** indicates significant at the 5% level, and *** indicates significant at the 1% level.

5.3.2. PSM

Regional cultural diversity in senior executives may represent endogenous bias caused by the CEO or the controlling shareholder's selection of local senior executives to join the management team in order to reduce the uncertainty of environmental protection investment. In order to alleviate this endogeneity problem, this paper used the PSM model to re-examine the causal relationship between regional cultural diversity in the top management team and environmental protection investment. The covariates at the tendency score matching (PSM) stage are the control variables in the benchmark regression model, and the matching method is minimum nearest neighbor matching. The estimation results of the PSM model are shown in Table 5. The estimation coefficients of Hete are significantly positive, making them basically consistent with the benchmark regression results.

Table 5. Test results based on PSM samples.

	(1)	(2)	(3)
	EnvInv	**EnvInv**	**EnvInv**
Hete	0.1654 ***	0.1626 ***	0.1219 ***
	(5.0683)	(5.0121)	(3.8204)
Size			−0.0320 ***
			(−20.7436)
ROA			0.0016
			(0.3828)
Lev			−0.0010
			(−0.7733)
FCF			−0.0784 ***
			(−4.1155)
Growth			0.0095 ***
			(3.9764)
Dual			0.0107 ***
			(2.7695)
Board			−0.0046 ***
			(−3.7512)
Inde			−0.0474
			(−1.3188)
Fem			−0.0177
			(−1.3317)
Conc			−0.0067
			(−0.4385)
_cons	0.9257 ***	0.9710 ***	1.7207 ***
	(200.9240)	(58.7329)	(44.5208)
Year FE	No	Yes	Yes
Industry FE	No	Yes	Yes
N	16,689	16,689	16,689
r2_a	0.0015	0.0258	0.0607

Note: *** indicates significant at the 1% level.

6. Section Analysis

6.1. Analysis of Influence Heterogeneity between Monopoly Industry and Competitive Industry

The previous section proposed that regional cultural diversity in executives has a more significant effect on the improvement of environmental protection investment in competitive industries. In order to test this possible impact heterogeneity, the sample was divided into monopoly industries (Comp = 1) and competitive industries (Comp = 0), and the impact heterogeneity of monopoly industries and competitive industries was tested via group regression. The group regression results are shown in Table 6. Column (1) shows the regression results of the competitive industry samples, and column (2) shows the regression results of the monopoly industry samples. These results show that the coefficient of Hete in

the competitive industry sample is significantly positive at the level of 1%, the coefficient of Hete in the monopoly industry sample is significantly positive at the level of 1%, and the test of Suest shows that the Hete coefficient in the competitive industry sample is significantly greater than that in the monopoly industry sample; this indicates that cultural diversity in top management teams has a more significant effect on the improvement of environmental protection investment in competitive industries. A possible reason for this is that the economic consequences of the optimization of top management teams are more likely to be reflected in competitive industries, while the monopoly industries are less affected by regional culture due to a lack of market competition constraints. It is assumed that H2 is verified.

Table 6. Group inspection results of monopoly industries and competitive industries.

	(1)	(2)
	EnvInv Comp = 1	**EnvInv Comp = 0**
Hete	0.2151 ***	0.1104 ***
	(4.6315)	(3.9688)
Size	−0.0390 ***	−0.0282 ***
	(−17.6924)	(−22.4457)
ROA	−0.0032	−0.0046 **
	(−0.1884)	(−2.3794)
Lev	−0.0071	−0.0026 ***
	(−1.0209)	(−2.9077)
FCF	−0.0836 ***	−0.0523 ***
	(−2.9865)	(−3.3622)
Growth	0.0103 ***	0.0080 ***
	(2.6976)	(4.0293)
Dual	0.0069	0.0113 ***
	(1.2138)	(3.4301)
Board	−0.0086 ***	−0.0025 **
	(−5.3030)	(−2.4063)
Inde	−0.0232	−0.0571 **
	(−0.4475)	(−1.9623)
Fem	0.0323	−0.0101
	(1.6323)	(−0.8985)
Conc	−0.0225	−0.0572 ***
	(−1.0380)	(−4.4733)
_cons	1.8595 ***	1.6105 ***
	(36.5830)	(52.1614)
Year FE	Yes	Yes
Industry FE	Yes	Yes
N	12,053	19,857
r2_a	0.0810	0.0593

Note: ** indicates significant at the 5% level, and *** indicates significant at the 1% level.

6.2. Analysis of the Impact Heterogeneity between Enterprises in Coastal Provinces and Inland Enterprises

The previous article proposed that regional cultural diversity in executives has a more significant effect on the improvement of environmental protection investment in enterprises in coastal provinces. In order to test this possible impact heterogeneity, enterprises were divided into coastal provinces and inland provinces by region, the sample was divided into coastal provinces and inland provinces, and the heterogeneity of enterprise regions was tested via group regression. The group regression results are shown in Table 7. Column (1) shows the regression results of the sample of coastal enterprises, and column (2) shows the regression results of the sample of inland enterprises. These results show that the Hete coefficient in the sample of enterprises in coastal provinces and inland provinces is significantly positive at the level of 1%, while the Hete coefficient in the sample of

enterprises in coastal provinces is higher, which indicates that regional cultural diversity in executives has a more significant effect on the promotion of environmental protection investment in enterprises in coastal provinces. Assumption H3 is verified.

Table 7. Group inspection results of coastal enterprises and inland enterprises.

	(1)	(2)
	EnvInv Coast = 1	**EnvInv Coast = 0**
Hete	0.1589 ***	0.1398 ***
	(5.2508)	(3.3312)
Size	−0.0338 ***	−0.0297 ***
	(−22.1879)	(−16.7494)
ROA	−0.0084 ***	0.0005
	(−3.1865)	(0.1252)
Lev	−0.0062	−0.0017
	(−1.0921)	(−1.3346)
FCF	−0.0728 ***	−0.0720 ***
	(−3.7343)	(−3.1028)
Growth	0.0095 ***	0.0082 **
	(4.3698)	(2.3900)
Dual	0.0070 *	0.0147 ***
	(1.9583)	(2.7879)
Board	−0.0045 ***	−0.0064 ***
	(−3.7738)	(−4.6428)
Inde	−0.0431	−0.0729 *
	(−1.2361)	(−1.7836)
Fem	−0.0067	0.0243
	(−0.5392)	(1.4079)
Conc	−0.0558 ***	−0.0379 **
	(−3.8566)	(−2.0470)
_cons	1.7590 ***	1.6852 ***
	(44.9930)	(39.1596)
Year FE	Yes	Yes
Industry FE	Yes	Yes
N	18,867	13,043
r2_a	0.0707	0.0777

Note: * indicates significant at the 10% level, ** indicates significant at the 5% level and *** indicates significant at the 1% level.

7. Conclusions and Policy Implications

This article examines the impact of culture, an informal system, on corporate environmental investment from the perspective of regional cultural diversity in top management teams. Similar to previous research findings on promoting environmental investment through multiculturalism [46,47], this study concludes that there is a positive correlation between the level of regional cultural diversity present in a company's top management team and their investment effectiveness in environmental protection. In other words, companies with higher levels of regional cultural diversity in top management teams often perform better in environmental protection investment. Similar to the research findings of Gunnthorsdottir [48], which state that cultural diversity can lead to more socially responsible investment decisions, and Kajzer [49], which state that cultural diversity can promote more sustainable practices and investment in coastal areas, the role of regional cultural diversity in promoting environmental investment is found to be more significant for companies located in coastal areas and competitive industries. The diversity of regional culture in top management teams is more conducive to promoting environmental protection investment by coastal enterprises, while its impact on non-coastal enterprises is not significant. Similarly, the diversity of regional culture within executive teams is more conducive to

promoting environmental protection investment in companies in competitive industries, while its impact on monopolistic industry enterprises is not significant.

This study emphasizes the importance of regional cultural diversity in promoting environmental investment and decision-making by Chinese enterprises. These research results indicate that enterprises should incorporate environmental protection investment into their long-term strategic planning and prioritize attracting and cultivating managers and employees with different cultural backgrounds, in order to fully leverage the positive role of multiculturalism in environmental protection investment. Enterprises in different regions and industries should also consider the composition of their management teams based on their unique needs and characteristics. In addition, companies should establish effective communication mechanisms and policies, and an inclusive culture, to promote multicultural exchange and resolve any conflicts or frictions that may arise. By doing so, enterprises can create a favorable environment for promoting environmental investment and contribute to sustainable development.

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