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Article

# The pulse of a new culture: A study of the impact of cultural integration on corporate innovation

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**Abstract:** This study investigates the influence of cultural fusion between China and the West, particularly in the context of Western powers' historical invasions, on corporate innovation. The purpose of this research is to quantify the degree of cultural fusion and its implications for innovation within corporations. Utilizing a regional variance method and entropy approach, the findings reveal several key insights. First, while traditional Chinese culture tends to constrain innovation, Western culture exhibits an inverted U-shaped relationship with corporate innovation, suggesting that cultural fusion acts as a significant driver of innovation. Second, regarding executive characteristics, teams with less international exposure but greater professional diversity demonstrate heightened innovation capabilities under cultural integration. Third, firm characteristics reveal that cultural fusion exerts a more pronounced impact on innovation in state-owned enterprises and firms with lower pollution levels. Additionally, an extended analysis indicates that cultural fusion significantly enhances innovation in firms with moderate innovation levels, improving both innovation inputs and outputs as well as overall quality. This study provides valuable empirical evidence for understanding the dynamic relationship between cultural fusion and corporate innovation, contributing to the broader discourse on innovation in the context of cross-cultural interactions.

**Keywords:** cultural fusion; corporate innovation; executive characteristics; heavy polluters; state-owned enterprises

## 1. Introduction

In a 2000 speech entitled "The Age of Leadership", former British Prime Minister Margaret Thatcher stated starkly that China might not become a superpower to rival the United States because it lacked the kind of "contagious" doctrine—the kind of theory or idea that could drive power and weaken Western influence. She further argues that China exports household appliances, not ideas. This view is supported by the structure of China's foreign trade in recent years, which, in imitating Japan, the second-largest world economy, in its marketing of transistors, is gradually becoming a kind of nouveau riche that looks glamorous but will never make it to the social elite. However, unlike Japan, China has been shifting from "Made in China" to the pursuit of "Made in China" since the promulgation of "Made in China 2025" in 2015, which raises an important question: Why hasn't China become obsessed with economic splendor, as Japan did in the 1980s? Is there really no "contagious" doctrine in China? In the context of globalization, traditional Chinese culture underwent a prolonged process of adaptation and learning following the incursion of Western powers. In this process, Chinese culture not only held fast to its own cultural traditions, but also began to accept another form of human thought—the fusion and convergence of Chinese and Western cultures. As a result, in this land of China, centralized unity and democratic

separation, the hand of the government and the hand of the market, the uniformity of public opinion and the freedom of public opinion, the middle way and the bipolar thinking, the spiritual pursuit and the material pursuit, all of which are very different worldviews, have gradually realized integration, resulting in the formation of a new culture that has both Chinese characteristics and integrates the world's ideas. Under the guidance of this new culture, China has gradually developed a political system led by the Communist Party with the participation of other democratic parties, a synergistic development of the economy with the "visible hand" of the government and the "invisible hand" of the market, and the dual goals of spiritual and material pursuits. A series of specific modes of action and development directions with Chinese characteristics and in line with the requirements of the times. However, there is no clear answer to the question of how this cultural integration affects the innovation ability, which is generally regarded as the core competitiveness of enterprises, and furthermore, whether the relationship between cultural integration and enterprise innovation is heterogeneous according to the characteristics of executives and enterprise traits? Clarifying these questions would help provide empirical evidence on the existence of a "contagious" cultural doctrine in China, as well as deepen the understanding of the factors influencing firm innovation and high-quality economic development.

Based on the theory of cultural difference and the theory of high-order ladder, this paper focuses on analyzing the influence effect of cultural integration on enterprise innovation output and its mechanism. On this basis, the relationship between cultural integration and corporate innovation is analyzed by constructing cultural integration variables using the regional difference degree and entropy method, and selecting patent data of A-share listed companies in Shanghai and Shenzhen from 2011 to 2020. Further, the paper also tests the heterogeneity of the effects from the perspectives of executive characteristics and firm traits to deepen the understanding about the impact of cultural integration on firm innovation. In addition, the paper extends the discussion of the impact of cultural integration on firms' innovation output at each innovation level quartile. To overcome the endogeneity problem, this paper tests the robustness of the results by using the number of times each city has resisted invasions by the West in the recent past as an instrumental variable and propensity score matching difference-in-differences model（PSM-DID) using firm relocation as a quasi-natural experiment. This research not only contributes to academic knowledge but also holds significant implications for society at large. By evaluating the key determinants of cultural integration and its influence on corporate innovation, the findings can guide policymakers in fostering environments that encourage cultural exchange and innovation. Understanding how cultural dynamics shape business practices can lead to strategies that enhance corporate competitiveness, ultimately driving economic growth and improving living standards. Moreover, this research can inform educational institutions and cultural organizations about the importance of promoting cultural understanding, which can enhance social cohesion and collective creativity in an increasingly globalized world.

The marginal contributions of this research are as follows: First, it offers a new perspective on the innovation and development dynamics of Chinese firms through

the lens of Chinese-Western cultural fusion, providing empirical support for the emergence of Chinese culture as a global influence. Second, it presents a refined measure of cultural integration based on regional differences and information entropy, establishing a foundation for future studies on cultural integration's impact across various domains. Third, grounded in high-order echelon theory, it uncovers the mechanisms through which cultural integration promotes corporate innovation, providing a novel perspective on innovation dynamics. Finally, by analyzing executive characteristics and firm nature, it identifies moderating factors affecting cultural integration's role in innovation, offering valuable guidance for enterprise operations.

## 2. Literature review and theoretical derivation

Due to the influence of specific geographic environment and traditional political culture, Chinese and Western cultures have formed different worldviews [1], and the differences between the two worldviews lead to the heterogeneity of management values under their influence. Based on the high-order ladder theory, the heterogeneity of management values leads to the diversity of corporate strategies and eventually manifests itself in differences in corporate behaviors. First, we examine the influence of traditional Chinese culture on innovation. Under the dominance of Confucianism, the worldview of "the unity of heaven and mankind" has led corporate management and employees to pay more attention to perception rather than formal argumentation, and the value relationship between human beings and the material world has taken the place of the role of recognizing and transforming the material world [2]. In addition, Muhammad highlights the role of cultural institutions such as Confucius Institutes in promoting cultural diplomacy and its potential impact on the dynamics of innovation, as well as the broader context in which cultural integration operates [3]. However, this also hinders the scientific theoretical derivation process, a necessary condition for innovation. For example, the "family-oriented" and "centralized" characteristics of traditional Chinese culture have reinforced the centralized ideology of business owners, and the authoritarian leadership that emerged from more than 3000 years of the Chinese imperial system has emphasized the obedience and dependence of employees [3]. This leads to lower psychological ownership of employees [4], and employees' motivation to innovate is frustrated, which in turn hinders the innovative development of enterprises. On the contrary, Western culture, with its Greek cultural roots, has formed a worldview of "the separation of heaven and man", and tends to emphasize empirical evidence and situation analysis [5], but this may neglect the process of comprehension, leading to the lack of innovative inspiration soil. Therefore, although enterprises influenced by Western culture may have the basic innovation ability, when the influence of Western culture is gradually increasing, the degree of inhibition of the spiritual soil of Chinese culture "unity of heaven and mankind" is also increasing, which makes it difficult for enterprises to realize deeper and more sustainable innovation. In addition, the concept of "individualism" in Western culture strengthens the self-interest of management, making it difficult for management to innovate spontaneously when there is no incentive to innovate. However, when firms are incentivized to innovate, management may choose to increase firm value by promoting innovation, motivated by the pursuit of compensation or personal

reputation. However, when the spirit of self-interest becomes stronger, management may no longer be satisfied with the limited compensation brought by the incentive system, but turn to seek unlimited private interests through various means, thus neglecting corporate innovation, and even resisting the external attention brought by corporate innovation. At the same time, the concept of "democratic decentralization" in Western culture may weaken the regulatory capacity [6], and employees will not spontaneously innovate for the long-term interests of the owner, which in turn creates a restriction on corporate innovation behavior. To summarize, traditional Chinese culture may inhibit corporate innovation, while to a moderate extent, Western culture may promote corporate innovation. However, as Western culture intensifies, it may gradually inhibit firms' innovative behavior.

In the context of globalization, the fusion of Chinese and Western cultures is inevitable. The invasion of China by the Eight-Power Allied Forces and the subsequent Western influences have forced China to be receptive to foreign cultures. However, in the process of acceptance, Chinese culture has always adhered to its own core values, which is a kind of cultural self-protection and self-development needs [7]. The balance between the two embodies the concept of "degree" [8]. "Degree" embodies the Eastern Way of Mediocrity and includes the Western philosophy of balance [9], which is an optimal state of acceptance and change, which can absorb new elements and maintain its own essence, similar to the optimization or marginal analysis in economics, i.e., to find the optimal allocation of resources in order to maximize the effectiveness. efficiency. This fusion helps to reconcile the differences between Chinese and Western cultures in some core values and behavioral patterns, such as centralization versus freedom, stability versus change, and the group versus the individual, in order to achieve a more effective cultural integration. Such integration can produce a new, more inclusive and flexible cultural value that can help promote innovation and progress. Specifically, the "family orientation" and "centralization" of Chinese culture lead to authoritarianism, which may hinder innovation, while the "individual orientation" of Western culture may lead to self-interested behavior, making innovation unsustainable. Self-interested behavior in Western culture may cause innovation to lose its durability. However, when Chinese and Western cultures merge with "degree" as the core, the shortcomings of the two will be suppressed and the strengths of the two will be emphasized. "Degree" is the balance between authority and freedom, stability and change, and group and individual, which can create an inclusive, free and fair environment conducive to the emergence and development of innovation. In addition, the cultural integration centered on "degree" breaks the limitations of thinking that may be brought by a single culture, and provides more diversified perspectives and ways of thinking for enterprise innovation [10]. This fusion in innovation management can realize the balance between rationality and sensibility, form and substance, process and result, stability and change, and then stimulate more innovation vitality. In corporate strategy, the cultural integration centered on "degree" will bring a more comprehensive strategic perspective, enabling enterprises to seize opportunities and meet challenges in globalized competition, so as to better carry out innovation [11]. In summary, the cultural integration centered on "degree" provides a broader perspective for enterprise innovation, balances the advantages and disadvantages of Chinese and Western cultures, and creates a

favorable environment for enterprise innovation. This kind of cultural integration can find common ground in differences and stability in changes, without sacrificing the innovation drive of enterprises or destroying the stability of enterprises. This will greatly improve the competitiveness of enterprises in the globalization environment and promote the long-term development of enterprises. Based on the above analysis, this paper puts forward the following hypotheses:

H1: Cultural integration can promote corporate innovation.

Understanding and capitalizing on the effects of cultural integration is critical to a firm's innovativeness, and this, in particular, is reflected in the company's executives. The background characteristics of executives, including their nationalities, educational backgrounds, and professional experiences, are factors that can profoundly affect their thinking patterns and decision-making behaviors, and thus the firm's innovativeness [12]. In the case of executives from non-overseas backgrounds, for example, such executives have grown up with a strong exposure to local culture, which enables them to better understand and utilize the resources of the local culture when dealing with problems and making decisions [13]. When the influence of Western culture intervenes, on the one hand, from a psychological point of view, people process new information by comparing and correlating it with known knowledge and experiences [14]. Therefore, based on their deep understanding of the local culture, they are better able to understand and analyze Western ideas and concepts using a comparative perspective, and thus better able to identify the connections and complementarities between the two. On the other hand, when faced with Western culture shock, executives from non-overseas backgrounds need to identify new ways of thinking and solutions to adapt to and capitalize on the shock, and the process will stimulate their innovative thinking, leading to a better understanding and digestion of Western ideologies [15]. This in-depth understanding and search for intercultural commonalities helps them to hold on to the strengths of their native culture while being flexible enough to utilize Western methodologies when solving problems. Such adaptability and flexibility are important for maintaining and enhancing corporate innovativeness in an ever-changing business environment. At the same time, executives with diverse professional backgrounds play an important role in promoting cultural integration. The experience of such executives in different fields makes them have a broad vision and rich experience. They can accept different ideas and concepts more easily and deal with various complex problems more flexibly [16]. Executives' diverse backgrounds enable them to combine knowledge and experience from different fields to find novel solutions when facing innovation challenges. In addition, executives' diverse backgrounds also enable them to better understand and accept different cultures when facing them, making it easier to achieve cultural integration [17]. This is crucial for innovation that requires constant acceptance of new ideas and approaches, and the need to find new possibilities in understanding and accepting differences. To summarize, executives from non-overseas backgrounds and diverse professional backgrounds are more capable of identifying new ways of thinking and solutions in cultural integration through their in-depth cultural understanding, flexible problem-solving approach, broad vision and rich experience, and improving the innovation capability of their firms. Therefore, this paper proposes the following hypothesis:

H2: Compared with the executive team with overseas background and non-diverse professional background, the executive team with non-overseas background and diverse professional background is more capable of utilizing the facilitating effect of cultural integration on innovation.

Taking ownership structure and industry characteristics into account, firms in specific environments, such as State-Owned Enterprises (SOEs) and Non-Resident Locales (NRLs), may exhibit greater innovation potential in cultural integration. First, as an important material and political foundation of socialism with Chinese characteristics, SOEs shoulder a more significant social responsibility to simultaneously balance economic and social benefits. This double pressure drives them to fall into the contradiction between short-term gain and long-term development when making business decisions. Cultural integration provides an effective methodology in this process. By absorbing Western management concepts and methods and combining them with traditional Chinese culture and values, SOEs may be able to find an equilibrium between maintaining economic benefits and improving social benefits. In addition, SOEs usually have a strong resource advantage, which makes them capable of investing more resources in cultural learning and innovative practices. As a result, we can expect the promotion of innovation by cultural integration to be more significant in SOEs.

Second, consider non-heavily polluting enterprises. Compared to heavily polluting firms, non-heavily polluting firms have relatively less environmental pressure, which allows them to have more resources and energy that can be invested in core business and innovation activities. At the same time, since non-polluting enterprises are usually in knowledge-intensive industries such as high-tech, service and creative industries and face more intense market competition, they tend to be more open and flexible, more receptive to new ideas and technologies, and more willing to try out new management methods and business models. Against this background, cultural integration can bring them new perspectives and ways of thinking, further promoting their innovative activities. In addition, for heavily polluting industries, such as oil, petrochemical, and coal, although such firms face strong pressure to innovate, due to the nature of their business, they are more likely to focus on technological innovations to improve productivity, reduce production costs, or lower pollution emissions [18]. Such innovations usually require deep specialized technical knowledge and may, to some extent, conflict with the original corporate culture. Therefore, such firms may face greater challenges in cultural integration. On the contrary, non-heavy polluters may be more concerned about corporate sustainability and social responsibility, and they may focus more on product innovation, service innovation or business model innovation in terms of innovation. Such innovations require a broader perspective and more diversified thinking, which is exactly what cultural integration can provide. Therefore, it is reasonable to expect that the facilitating effect of cultural integration on innovation will also be more significant in non-heavy polluting firms. Based on the above analysis, this paper proposes the following hypotheses:

H3: Cultural integration is more likely to promote firm innovation in state-owned and non-heavily polluting firms compared to non-state-owned and heavily polluting firms.

# 3. Research design

## 3.1. Sample selection and data source

This paper takes 2011–2020 A-share listed companies in Shanghai and Shenzhen as the research sample, excludes the financial and insurance industry, companies with abnormal trading status (ST, *ST, PT), and Winsorizes the main continuity variables with the first and last 1%, and finally obtains a total of 15,789 firm-annual observations. The main financial data and corporate governance data in this paper come from the Cathay Pacific Database (CSMAR); patent data and the number of Confucian, Buddhist, Taoist, Christian and Islamic temples come from the China Research Data Service Platform (CNRDS).

## 3.2. Definition of variables

### 3.2.1. Firm innovation

Drawing on [19], two metrics are chosen: (1) Patent1, expressed as the natural logarithm of the total number of invention, utility model, and design patents filed plus one; (2) Patent2, which assigns a weight of 3:2:1 as the innovation component of invention, utility model, and design patents decreases in that order. expressed as the natural logarithm of the weighted total number of the three types of patent applications plus one. In addition, in the robustness test part, firstly, considering the subjectivity of the assignment, the natural logarithm of the total number of applications plus 1 for utility model and design patents (Patent3), and the natural logarithm of the total number of applications plus 1 for invention patents (Patent4) are selected to re-measure the innovation of the enterprise, respectively; secondly, considering that the number of patents granted better represents the degree of innovation of the enterprise, the four indicators mentioned above are replaced by the number of applications granted in turn, and the number of applications granted is replaced by the number of patents granted. Secondly, considering that the number of applications is more representative of the degree of innovation of an enterprise, the four indicators mentioned above are replaced by the number of grants in order to measure the degree of innovation of an enterprise, which is recorded as Patent_Award1, Patent_Award2, Patent_Award3 and Patent_Award4.

### 3.2.2. Cultural integration

Dialects and religions play a key role in shaping the cultural identity and character of a region or group [8]. First, there are a wide variety of Western dialects, the number of speakers in China is not easy to be counted, and it is more difficult to be statistically significant as English, the dominant language, is widely used in China; second, religious beliefs influence people's values, morals, codes of behavior, and social norms, and the temples of a religion to a certain extent represent the degree of influence of that religion in a locality [20]; and finally, before the invasion of China by Western powers, missionaries of Christianity and other religions also entered China to propagate, but with little effect, and when the Western powers invaded China, Chinese traditional culture was forced to start a hundred years of learning road under the threat of the strong ships and artillery, and Christianity, Islam and other foreign religions began to spread widely in the land of China, and the representative

characteristic is the proliferation of the number of temples [21], so the number of religious temples can represent the degree of influence of the religion in the local area [22]. Therefore, the number of temples of religions can indicate to a certain extent the impact of foreign cultures on Chinese culture, and with time gradually manifests itself in the degree of integration between traditional Chinese culture and foreign cultures. Therefore, this paper chooses the religious perspective, i.e., using the intermingling patterns of religious temples to measure the degree of integration of Chinese and Western cultures.

Inspired by [22] measure of spatial concentration, the degree of regional variation is used to measure cultural integration. Since the regional variability approach can provide information about regional differences in the number of temples because it can take into account the distribution of the number of temples in different regions, including the degree of concentration and heterogeneity of the distribution, the degree of regional variability of five religions, namely, Confucianism, Buddhism, and Taoism, which are traditional Chinese religions, as well as Islam and Christianity, which are international traditional religions, was used to measure the degree of cultural integration. The specific calculations are as follows: First, the ratio of the number of temples of the five religions to the total number of temples in each prefecture-level city is calculated; second, in order to mitigate the effect of smaller values and to deal with the case where the ratio is zero, the negative logarithm of the ratio of the number of religious temples in each prefecture-level city is calculated (taking the natural logarithm), if the proportion of the number of religious temples of a certain religion is 0, the negative logarithm is taken to be 0; third, the negative logarithm of each prefecture-level city is normalized by dividing it by the number of prefectures under the natural logarithm (i.e., the length of the number of temples dataset); fourth, the negative logarithmic value of the normalized value of each prefecture-level city is multiplied by the proportion of the number of religious temples of its corresponding prefecture-level city, and the final normalized value is obtained; Fifth, the normalized value for each prefecture is computed by dividing the relevant indicators for each prefecture by the number of prefecture-level cities. The natural logarithm of this ratio is then taken to adjust for scale and distribution, after which the regional disparity index is obtained. For ease of interpretation, the resulting regional disparity indicator is multiplied by −1 to obtain the cultural convergence indicator (CWCC). The larger the cultural integration indicator, the more balanced the distribution of the number of religious temples among prefecture-level cities, i.e., the higher the degree of cultural integration. In addition, the entropy method is utilized in the robustness test section to calculate the cultural integration indicator (CWCC_2).

### 3.2.3. Control variables

Drawing on existing studies [23,24], this paper controls the factors that may have an impact on corporate innovation, including company size (Size), capital structure (Lev), net interest rate on total assets (ROA), corporate growth (Growth), number of directors (Board), and proportion of independent directors (Indep), shareholding of the first largest shareholder (Top1), equity checks and balances (Balance), ownership structure (SOE), and Tobin's Q (TobinQ). In addition, the paper controls for year,

industry, and firm-level fixed effects, as well as corrects using firm-level clustering standard errors.

### 3.3. Econometric models

Based on the research setting of this paper, model (1) is constructed to examine the impact of cultural integration on corporate innovation:

$$Patent_{i,t} = \alpha_0 + \alpha_1 CWCC_{i,t} + \sum Controls_{i,t} + Id + Year + Industry + \varepsilon_{i,t} \quad (1)$$

### 3.4. Descriptive statistics

**Table 1** presents the descriptive statistics of the key variables. The standard deviation of cultural integration (CWCC) is 0.0936, which is greater than 0.05, indicating that the data are statistically significant with high dispersion. The means of the corporate innovation variables are all greater than the standard deviation, indicating that the overall data for the corporate innovation variables are right-skewed, which implies that the number of patent applications is low for most firms, and that there exist a few firms with stronger innovation capabilities or more aggressive patenting strategies that have significantly more patent applications than most firms.

**Table 1.** Descriptive statistical analysis of key variables.

| variable | N | Mean | S.D. | Min | P50 | Max |
|---|---|---|---|---|---|---|
| Patent1 | 15,789 | 2.697 | 1.838 | 0 | 2.890 | 7.059 |
| Patent2 | 15,789 | 3.323 | 2.109 | 0 | 3.689 | 7.933 |
| CWCC | 15,789 | −0.122 | 0.0936 | −0.347 | −0.106 | 0.0250 |
| Size | 15,789 | 22.46 | 1.277 | 19.50 | 22.30 | 26.27 |
| Lev | 15,789 | 0.455 | 0.203 | 0.0658 | 0.451 | 0.947 |
| ROA | 15,789 | 0.0356 | 0.0627 | −0.294 | 0.0337 | 0.212 |
| Growth | 15,789 | 0.167 | 0.503 | −0.628 | 0.0879 | 4.028 |
| Board | 15,789 | 2.143 | 0.198 | 1.609 | 2.197 | 2.708 |
| Indep | 15,789 | 0.375 | 0.0534 | 0.333 | 0.357 | 0.571 |
| Top1 | 15,789 | 0.338 | 0.147 | 0.0834 | 0.316 | 0.729 |
| Balance | 15,789 | 0.685 | 0.590 | 0.0259 | 0.509 | 2.660 |
| SOE | 15,789 | 0.463 | 0.499 | 0 | 0 | 1 |
| TobinQ | 15,789 | 2.062 | 1.447 | 0.849 | 1.596 | 11.05 |

## 4. Analysis of empirical results

### 4.1. Cultural integration and enterprise innovation: A test of cultural integration for enterprise innovation

In columns (1) and (2) of **Table 2**, both variables of cultural integration (CWCC) and firm innovation (Patent1 and Patent2) are significantly positive at the 1% level, indicating that cultural integration can promote firm innovation. In addition, to further explain the power of cultural integration, this paper utilizes the sum of the number of Confucian, Taoist and Buddhist temples in the city where the firms are located to

measure the degree of Chinese traditional cultural influence (CTC) and the sum of the number of Islamic and Christian temples to measure the degree of foreign cultural impact (FC). As shown in the last four columns of **Table 3**, Chinese traditional culture inhibits firm innovation, while the effect of Western culture on firm innovation is an inverted U-shaped relationship, i.e., Western culture shock has a positive role in promoting firm innovation when it is weak, and inhibits firm innovation when it is enhanced to a certain extent, suggesting that Chinese traditional culture may not promote firm innovation by itself, whereas Western culture shock at a weaker level may promote firm innovation by enhancing When the Western culture shock is weak, it may promote technological innovation by enhancing the management's global vision or uncertainty perception, but when the foreign culture shock is strong, it may inhibit technological innovation by enhancing the management's sense of self-interest and short-term profit-seeking thinking. This further suggests that both traditional Chinese culture and foreign culture can significantly influence corporate behavior, highlighting the influence of culture, but culture can only meet the demands for innovation in the times by integrating the strengths and weaknesses of culture to achieve complementary strengths and weaknesses.

**Table 2.** Benchmark regression results.

| | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** |
|---|---|---|---|---|---|---|
| | **Patent1** | **Patent2** | **Patent1** | **Patent2** | **Patent1** | **Patent2** |
| CWCC | 2.8494*** | 2.9773*** | | | | |
| | (2.9640) | (2.6218) | | | | |
| CTC | | | −0.0011** | −0.0011* | | |
| | | | (−2.3114) | (−1.9494) | | |
| $FC^2$ | | | | | −0.0003** | −0.0003** |
| | | | | | (−2.2885) | (−2.3700) |
| FC | | | | | 0.0321*** | 0.0362*** |
| | | | | | (2.6122) | (2.6157) |
| Size | 0.5040*** | 0.5694*** | 0.5045*** | 0.5699*** | 0.5048*** | 0.5703*** |
| | (12.3632) | (12.1549) | (12.3770) | (12.1685) | (12.4068) | (12.2117) |
| Lev | −0.2073* | −0.2776** | −0.2029* | −0.2731** | −0.2169* | −0.2886** |
| | (−1.7358) | (−2.0032) | (−1.6947) | (−1.9668) | (−1.8210) | (−2.0927) |
| ROA | −0.0915 | −0.0986 | −0.0781 | −0.0850 | −0.0908 | −0.0982 |
| | (−0.5385) | (−0.4981) | (−0.4587) | (−0.4283) | (−0.5333) | (−0.4957) |
| Growth | −0.0054 | −0.0087 | −0.0061 | −0.0094 | −0.0051 | −0.0085 |
| | (−0.3054) | (−0.4192) | (−0.3477) | (−0.4552) | (−0.2907) | (−0.4071) |
| Board | 0.0194 | 0.0499 | 0.0254 | 0.0561 | 0.0146 | 0.0444 |
| | (0.1551) | (0.3525) | (0.2028) | (0.3952) | (0.1170) | (0.3140) |
| Indep | −0.3124 | −0.2262 | −0.3039 | −0.2175 | −0.3216 | −0.2364 |
| | (−0.7718) | (−0.4969) | (−0.7497) | (−0.4774) | (−0.7932) | (−0.5186) |
| Top1 | −0.1797 | −0.1841 | −0.1910 | −0.1961 | −0.1516 | −0.1509 |
| | (−0.6618) | (−0.6001) | (−0.7033) | (−0.6391) | (−0.5611) | (−0.4945) |

**Table 2.** (*Continued*).

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | **Patent1** | **Patent2** | **Patent1** | **Patent2** | **Patent1** | **Patent2** |
| Balance | 0.0311 | 0.0343 | 0.0322 | 0.0354 | 0.0354 | 0.0391 |
| | (0.6338) | (0.6146) | (0.6563) | (0.6353) | (0.7224) | (0.7011) |
| SOE | 0.0026 | −0.0138 | −0.0024 | −0.0191 | −0.0133 | −0.0311 |
| | (0.0348) | (−0.1494) | (−0.0311) | (−0.2071) | (−0.1764) | (−0.3383) |
| TobinQ | 0.0119 | 0.0108 | 0.0126 | 0.0115 | 0.0132 | 0.0122 |
| | (1.1750) | (0.9023) | (1.2376) | (0.9572) | (1.2954) | (1.0179) |
| Constant | −8.0961*** | −8.9801*** | −8.2707*** | −9.1681*** | −8.6426*** | −9.5688*** |
| | (−8.2220) | (−7.9495) | (−8.4659) | (−8.1834) | (−8.9684) | (−8.6656) |
| Year | Yes | Yes | Yes | Yes | Yes | Yes |
| Id | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry | Yes | Yes | Yes | Yes | Yes | Yes |
| N | 15,789 | 15,789 | 15,789 | 15,789 | 15,789 | 15,789 |
| r2_a | 0.8353 | 0.8300 | 0.8352 | 0.8299 | 0.8353 | 0.8301 |

Note: *, ** and *** indicate significant at the 10%, 5% and 1% levels, respectively, with *t*-values in parentheses.

## 4.2. Cultural integration and corporate innovation: A test of the moderating effect of executive characteristics

Based on the inference of H2, executives with non-overseas backgrounds and diversified professional backgrounds are able to identify new ways of thinking and solutions in cultural integration and improve the innovation ability of the firms through their in-depth cultural understanding, flexible ways of dealing with problems, broad perspectives, and rich experiences. To test this hypothesis, drawing on [25], the total number of executive members with overseas background (all executives at the level of deputy general manager and above in the company, including assistant general manager, chief accountant, chief engineer, etc.) in the total number of executive team is recorded as the degree of executives' overseas background, and 1 is taken for those exceeding the industry average, otherwise 0. Similarly, occupations are categorized into the production, marketing, research and development, finance, management five categories, using the Huffington coefficient, H = 1—(pi denotes the ratio of the number of team members in category i to the total number of teams), and taking the value of 1 for firms greater than the industry average, and 0 otherwise. The regression results, as shown in **Table 3**, show that the promotion effect of cultural integration on corporate innovation is more significant when executives have the characteristics of diversified non-overseas backgrounds and occupational backgrounds.

**Table 3.** Subgroup regressions based on executive characteristics.

| | **Non-overseas background** | | **Overseas Background** | | **Homogenization of occupational backgrounds** | | **Diversification of occupational backgrounds** | |
|---|---|---|---|---|---|---|---|---|
| | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** | **(7)** | **(8)** |
| | **Patent1** | **Patent2** | **Patent1** | **Patent2** | **Patent1** | **Patent2** | **Patent1** | **Patent2** |
| CWCC | 3.2592*** | 3.3638** | −1.1337 | −1.6163 | 0.7560 | 0.4609 | 2.4200** | 2.6771* |
| | (2.6701) | (2.2786) | (−0.6659) | (−0.9132) | (0.6221) | (0.3112) | (2.1009) | (1.9147) |
| Constant | −8.1677*** | −9.0955*** | −8.6739*** | −9.7450*** | −7.5445*** | −8.7573*** | −9.6285*** | −10.1239*** |
| | (−6.8024) | (−6.6584) | (−4.3546) | (−4.1935) | (−6.1616) | (−6.2533) | (−6.8717) | (−6.3158) |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Id | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| N | 12,136 | 12,136 | 3448 | 3448 | 7754 | 7754 | 7644 | 7644 |
| r2_a | 0.807 | 0.802 | 0.823 | 0.810 | 0.813 | 0.809 | 0.816 | 0.805 |

Note: *, ** and *** indicate significant at the 10%, 5% and 1% levels, respectively, with *t*-values in parentheses.

## 4.3. Cultural integration and corporate innovation: A test of the moderating effect of firm nature

**Table 4.** Subgroup regression based on nature of business.

| | **Non-State-Owned Enterprises** | | **State-owned Enterprises** | | **Non-heavily polluted enterprises** | | **Heavily polluted enterprises** | |
|---|---|---|---|---|---|---|---|---|
| | **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** | **(7)** | **(8)** |
| | **Patent1** | **Patent2** | **Patent1** | **Patent2** | **Patent1** | **Patent2** | **Patent1** | **Patent2** |
| CWCC | 1.0210 | 1.0330 | 5.7157*** | 6.1269*** | 2.4790*** | 2.4211** | 4.2644 | 4.9671 |
| | (0.7147) | (0.6068) | (2.9208) | (2.7636) | (2.7705) | (2.3266) | (1.0234) | (0.9829) |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Id | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| N | 8372 | 8372 | 7328 | 7328 | 11,061 | 11,061 | 4660 | 4660 |
| r2_a | 0.780 | 0.773 | 0.838 | 0.832 | 0.835 | 0.830 | 0.726 | 0.715 |

Note: ** and *** indicate significant at the 5% and 1% levels, respectively, with *t*-values in parentheses.

Based on the inference of H3, state-owned enterprises (SOEs) have a greater need and ability to amplify the facilitating effect of cultural integration on corporate innovation due to the dual social and economic pressures as well as the scale and resource advantages they possess. The non-heavily polluting enterprises are also able to amplify the facilitating effect of cultural integration on innovation due to their lesser environmental pressure, higher openness and flexibility, sustainable development needs, and more resource inputs. In order to test this hypothesis, the enterprises are categorized into heavily polluted and non-heavily polluted enterprises according to the "Listed Companies Environmental Verification Industry Classification and

Management Directory" published by the Ministry of Ecology and Environmental Protection in 2008, and state-owned and non-state-owned enterprises, and heavily polluted and non-heavily polluted enterprises are regressed in groups, and the results are shown in **Table 4**. The regression results show that when the enterprises are state-owned and non-heavily polluted enterprises, the promotion effect of cultural integration on enterprise innovation is more obvious.

## 4.4. Robustness tests

### 4.4.1. Proxy variables for firm innovation

A substitution test for the relationship between cultural integration and firm innovation was conducted along the lines of the definition section of the firm innovation variables. As shown in **Table 5**, after replacing the innovation variables with the natural logarithm of the total number of utility model and design patents filed plus one (Patent3), the natural logarithm of the total number of invention patents filed plus one (Patent4), and replacing the number of patents filed with the number of patents granted sequentially (Patent_Award1, Patent_Award2, Patent_ Award3 and Patent_Award4), cultural integration and firm innovation remain significantly positive at the 1% level, indicating high reliability of the benchmark regression results.

**Table 5.** Robustness tests—Firm innovation.

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | **Patent3** | **Patent4** | **Patent_Award1** | **Patent_Award2** | **Patent_Award3** | **Patent_Award4** |
| CWCC | 3.1785*** | 2.7926*** | 3.5937*** | 3.9401*** | 2.0347*** | 3.7822*** |
| | (3.7981) | (2.7240) | (2.9071) | (2.5977) | (3.0843) | (3.0445) |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes |
| Year | Yes | Yes | Yes | Yes | Yes | Yes |
| Id | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry | Yes | Yes | Yes | Yes | Yes | Yes |
| N | 15,789 | 15,789 | 15,789 | 15,789 | 15,789 | 15,789 |
| r2_a | 0.8281 | 0.8100 | 0.8421 | 0.8398 | 0.8017 | 0.8133 |

Note: *** indicate significant at the 1% levels, respectively, with *t*-values in parentheses.

## 4.5. Endogenous treatment

### 4.5.1. Using PSM analysis

In order to exclude the endogeneity problem of sample selection, this paper adopts PSM analysis to deal with the selectivity bias in order to reduce the potential bias due to the selectivity of the independent variables. Since cultural integration is not a dummy variable, the largest 1/3 is taken as firms with higher cultural integration, and the remaining smaller ones are taken as firms with less cultural inclusion, and according to the characteristics of the firms as to carry out a 1:1 neighbor matching, the covariates include firm size, capital structure, total assets net interest rate, firm growth, number of directors, proportion of independent directors, proportion of shares held by the first largest shareholder, degree of equity checks and balances, property rights structure, and Tobin's Q. Since there are two explanatory variables in this paper, namely Patent1 and Patent2, we do PSM processing in turn. **Figures 1** and **2** show the

matching effect of PSM, which intuitively show that the bias of each control variable decreases after matching, effectively balancing the differences between the variables in the control group and the control group. Subsequently, we do the overall variability analysis for the samples before and after matching, and the results are shown in **Table 6**. The matching results, both the matching effect graphs of each variable and the statistical analysis of all the samples, show that the error is reduced after matching, and the average error of the unmatched sample group is 13.40, which is reduced to 0.9 after the matching, and the mean and median are equal, which indicates that not only reduces the error, but also makes the distribution more uniform, and the matching effect is good. The matching effect is good. From the test results, the LR-chi2 statistic before matching is 754.34, the *p*-value is 0, which indicates that the original hypothesis is rejected and the difference between the samples is considered to be significant, while the LR-chi2 statistic after matching is 4.13, and at this time the *p*-value tends to 1, which indicates that the original hypothesis should be accepted and the samples are considered to have no difference between them. Benchmark regression is conducted again for the matched samples, and the estimation results are shown in columns (3) and (4) of **Table 7**, indicating that the results of the benchmark regression are robust.

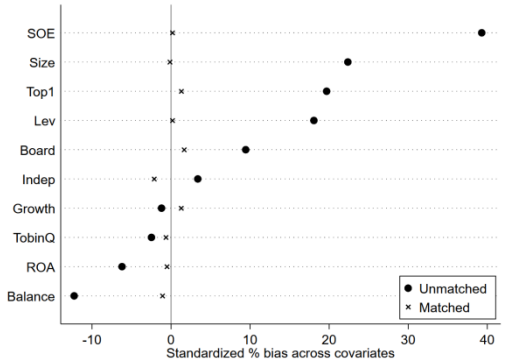


**Figure1.** Patent1 matching effect.

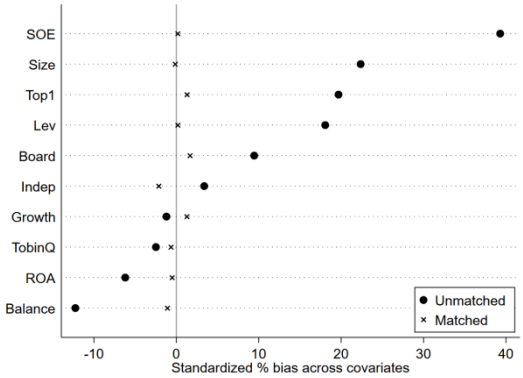


**Figure 2.** Patent2 matching effect.

**Table 6.** Overall variability analysis of samples before and after matching.

| Sample | Ps—R2 | LR chi2 | p > chi2 | MeanBias | MedBias | B | R | %Var |
|---|---|---|---|---|---|---|---|---|
| Unmatched | 0.034 | 754.34 | 0.00 | 13.40 | 10.90 | 44.10* | 1.21 | 89 |
| Matched | 0.00 | 4.13 | 0.941 | 0.90 | 0.90 | 3.20 | 0.96 | 56 |

Note: * indicate significant at the 10% levels, respectively, with *t*-values in parentheses.

**Table 7.** Robustness tests—Cultural integration and PSM.

| | **Test of proxy variables for cultural integration** | | **PSM** | |
|---|---|---|---|---|
| | **(1)** | **(2)** | **(3)** | **(4)** |
| | **Patent1** | **Patent2** | **Patent1** | **Patent2** |
| CWCC | | | 0.7412*** | 0.8078*** |
| | | | (2.7183) | (2.6392) |
| CWCC_2 | 1.0362*** | 1.1851*** | | |
| | (3.7288) | (3.6491) | | |
| Controls | Yes | Yes | Yes | Yes |
| Year | Yes | Yes | Yes | Yes |
| Id | Yes | Yes | Yes | Yes |
| Industry | Yes | Yes | Yes | Yes |
| N | 15,789 | 15,789 | 15,789 | 15,789 |
| r2_a | 0.808 | 0.802 | 0.808 | 0.802 |

Note: *** indicate significant at the 1% levels, respectively, with *t*-values in parentheses.

### 4.5.2. Instrumental variable method

The model may have endogeneity problems caused by the omission of variables, so this paper, based on the list of China's wars in Wikipedia, manually organizes the number of wars against the West that took place in each city in China during the period from the First Opium War in 1840 to the First World War in 1918, which is recorded as the instrumental variable IV. The reason for choosing this instrumental variable is that the more invasions the West made on Chinese cities, the more the Chinese culture was forced to absorb Western culture in that region. The reason for choosing this instrumental variable is that the more invasions of Chinese cities by Western countries, the greater the degree of forced absorption of Western culture by Chinese culture in the region, which is manifested as a higher degree of cultural integration over time, and therefore the number of invasions should show a significant positive correlation with the degree of cultural integration; in addition, the number of invasions by Western countries is historical data, which does not have any direct impact on today's corporate innovation. The time period of 1840 to 1918 was chosen because it was the main time period of Western invasions of China, and the following years were the Japanese invasions of China, which were excluded due to the fact that Japanese culture is derived from Chinese culture. The instrumental variable was regressed using 2SLS and the results are shown in **Table 8**. According to column (1), IV and CWCC are significantly positive at the 1% level, indicating that regions with more wars with the West have a higher degree of cultural integration, which is consistent with the inference of this paper. In addition, the value of the Cragg-Donald Wald F-statistic is 1419.17, which is much larger than the critical value of the Stock-Yogo weak identification test, suggesting that the instrumental variable IV is sufficiently strongly correlated with the endogenous explanatory variables, indicating that the weak instrumental variable test is passed. According to columns (2) and (3), both CWCC and the innovation variables Patent1 and Patent2 are significantly positive at the 5% level, indicating that the previous conclusions still hold after controlling for potential endogeneity problems.

**Table 8.** Instrumental variables approach.

| | (1) | (2) | (3) |
|---|---|---|---|
| | **CWCC** | **Patent1** | **Patent2** |
| IV | 0.0202*** | | |
| | (5.3124) | | |
| CWCC | | 9.4723** | 10.5555** |
| | | (2.1554) | (2.0001) |
| Controls | Yes | Yes | Yes |
| Cragg-Donald Wald F | 1419.17 | | |
| Year | Yes | Yes | Yes |
| Id | Yes | Yes | Yes |
| Industry | Yes | Yes | Yes |
| N | 15,789 | 15,789 | 15,789 |
| r2_a | 0.993 | 0.043 | 0.040 |

Note: ** and *** indicate significant at the 5% and 1% levels, respectively, with *t*-values in parentheses.

### 4.5.3. PSM-DID test based on corporate relocation events

*PSM-DID test*

In order to further exclude the endogeneity problem caused by omitted variables, a quasi-natural experiment is constructed based on the exogenous event of enterprise relocation. The reason for choosing enterprise relocation is the different degree of cultural integration in the region where the enterprise is located before and after relocation, which provides a good exogenous event for exploring the impact of cultural integration on enterprise innovation. In this paper, we use a double-differencing approach to identify changes in firm innovation when moving into or out of a city with a higher degree of cultural integration. PSM-DID is conducted to examine the relationship between firm relocation and innovation by using the PSM-matched samples from above, modeled as follows:

$$Patent_{i,t} = \alpha_0 + \alpha_1 DID_{i,t} + \alpha_2 Post_{i,t} + \alpha_3 Treat_{i,t} + \sum Controls_{i,t} + Id + Year + Industry + \varepsilon_{i,t} \quad (2)$$

Among them, Post is the variable of enterprise relocation, which takes the value of 1 in the year of enterprise relocation and the following years, otherwise it is 0. Treat is the variable of relocation cultural integration, which takes the value of 1 when the enterprise relocates from the area with a lower degree of cultural integration to the area with a higher degree of cultural integration, otherwise it is 0. DID is the product of Post and Treat. The results, as shown in **Table 9**, show that the degree of firm innovation increases when firms relocate to cities with a higher degree of cultural integration. This shows that the conclusions of this paper remain reliable after controlling for the endogeneity problem again.

**Table 9.** Test-PSM post-sample based on firm relocation events.

| | (1) | (2) |
|---|---|---|
| | **Patent1** | **Patent2** |
| DID | 0.261** | 0.305* |
| | (10.84) | (10.89) |
| Constant | −8.043*** | −12.512*** |
| | (−15.83) | (21.67) |
| Controls | Yes | Yes |
| Year | Yes | Yes |
| Id | Yes | Yes |
| Industry | Yes | Yes |
| N | 10,621 | 10,621 |
| r2_a | 0.808 | 0.801 |

Note: *, ** and *** indicate significant at the 10%, 5% and 1% levels, respectively, with *t*-values in parentheses.

*Parallel trend test*

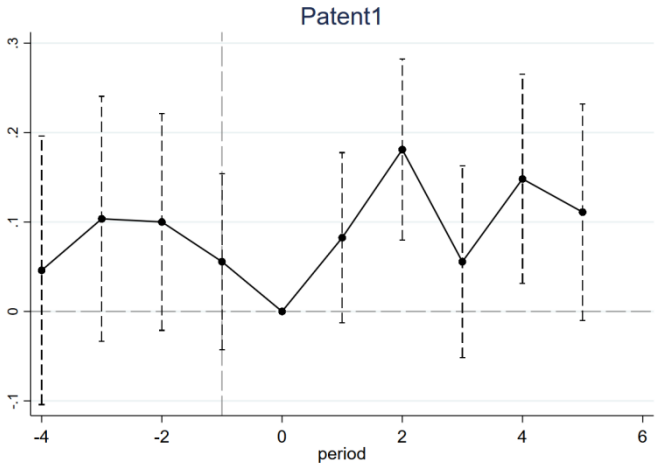


**Figure 3.** Patent1 parallel trend test plot.

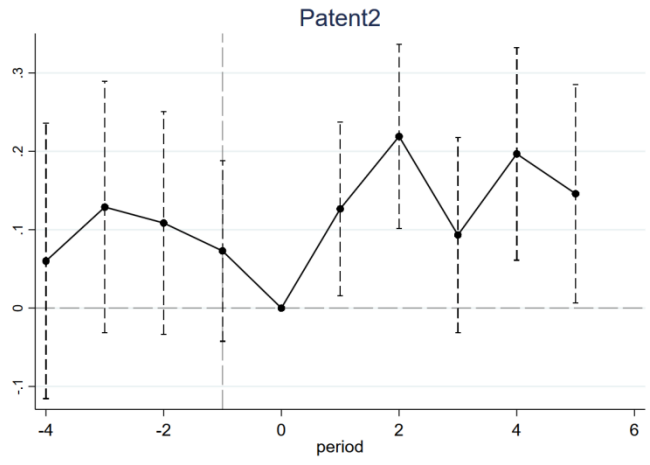


**Figure 4.** Patent2 parallel trend test plot.

Parallel trend test is a necessary test for the multi-period DID model, due to the inconsistency of the time point of the policy impact on the treatment group in the multi-period DID, so it is not suitable for group comparisons, but the same can be done for the parallel trend test, this paper defines the year of the event as PERIOD = 0, and subsequently based on the coefficient size of the period as well as the size of the error within the sample (shown by the black error bars in **Figures 3** and **4**, which indicate a 95% confidence intervals) comparing the time trend of the effect, the larger the error, the less significant the coefficient is in that period. From **Figures 3** and **4**, regardless of whether the explanatory variables are Patent1 or Patent2, before the event, the coefficients are decaying and the error is large, the confidence interval range falls below 0 indicating that the positive effect is not significant, after the event, the coefficients are positive and in the first 2 periods of the upward trend, the error of the Patent1 variable in the second period of the error decreases, and the range of the range of 0 value or more indicating that the coefficients significant, while Patent2 shows a significant trend in the 1st–2nd period after the event, and begins to decline in the 3rd period, but the decline is not large, and in the subsequent 4th period are positively significant, indicating that the innovation ability of the enterprise before relocation is low due to being in the area of lower cultural integration, and when the enterprise relocates to the area of higher cultural integration, the level of innovation is significantly increased, and in the later period still maintains a higher level.

*Placebo test*

In order to further enhance the robustness of the PSM-DID results, this paper simulates 500 times of random data, which are used to represent pseudo-events. **Figures 5** and **6** show the distribution of the estimated coefficients of the 500 pseudo-event occurrence dummy variables and the corresponding *p*-values when the dependent variable is Patent1 and Patent2, respectively, where the X-axis indicates the size of the estimated coefficients of the pseudo-event occurrence dummy variables, the Y-axis indicates the density and *p*-value, and the curve is the size of the estimated coefficients of the pseudo-event occurrence dummy variables. The X-axis indicates the size of the estimated coefficients of the "pseudo-event occurrence dummy variables", the Y-axis indicates the density value and the size of the *p*-value, the curve is the distribution of the kernel density of the estimated coefficients, the blue dots are the *p*-values corresponding to the estimated coefficients, the vertical dotted line is the true estimate of the DID model −0.0017, and the horizontal red dotted line is the significance level 0.1.

As can be seen from the figure, the estimated coefficients are mostly clustered around the zero point, and most of the estimates have *p*-values greater than 0.1 (which is not significant at the 10% level), which suggests that the estimates in this paper are unlikely to have been obtained by chance, and thus are unlikely to have been affected by other events or stochastic factors.

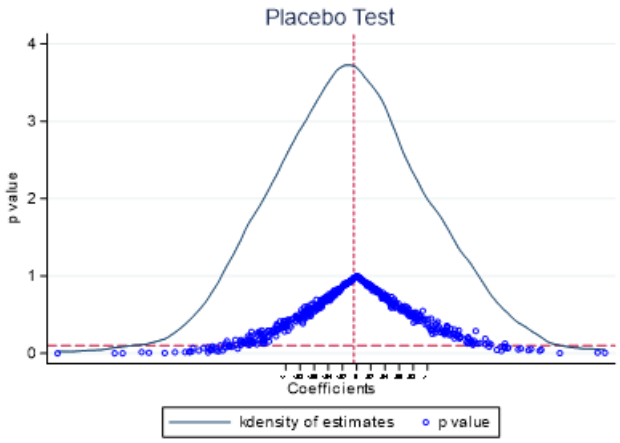


**Figure 5.** Placebo test 1.

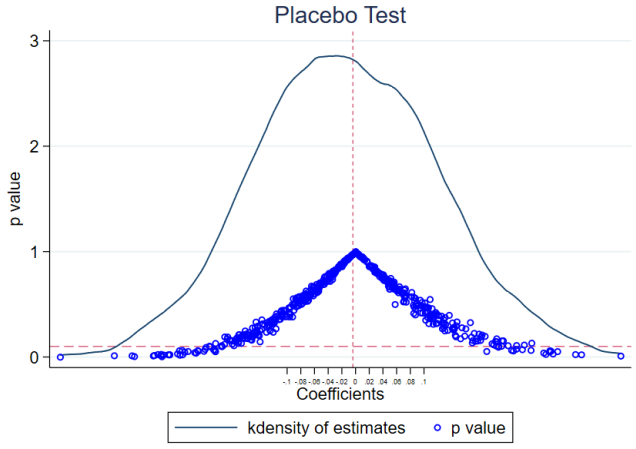


**Figure 6.** Placebo test 2.

## 5. Expanded analysis

### 5.1. Quantile regression

This paper has discussed in some detail how cultural integration affects firm innovation; however, there is room to deepen this discussion. Traditional regression analysis can only provide us with the average effect, but when we try to understand the full picture of the impact, it is not enough to focus on the average effect. This is because in many cases, the impact of the independent variable on the explanatory variables may differ across quartiles, and these differences will be overlooked if we focus only on the average effect. For this reason, this paper adopts the quantile regression approach to further understand the impact of cultural integration on corporate innovation. The advantage of this approach is that it not only helps us understand the effect of the independent variables on the mean of the explanatory variables, but also allows us to see the effect of the independent variables on the full distribution of the explanatory variables. As shown in **Table 10**, the effect of cultural integration on firm innovation is significant at the 0.30, 0.45 and 0.60 quantiles. However, this positive effect is not confirmed in the same way in the other quartiles, especially for firms with higher or lower levels of innovation. This means that for

those firms that are already leading on the innovation path, cultural integration does not significantly increase their advantage, and for those firms with relatively low levels of innovation, cultural integration does not significantly improve their situation. The significant impact of cultural integration is concentrated on firms with average levels of innovation and more room for growth. This phenomenon may imply that there may be a threshold for the promotion of innovation by cultural integration, and that it is only when firms reach this threshold that cultural integration can realize its potential.

**Table 10.** Quantile regression.

| | **Patent1** | | | | | | **Patent2** | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **τ = 0.15** | **τ = 0.30** | **τ = 0.45** | **τ = 0.60** | **τ = 0.75** | **τ = 0.90** | **τ = 0.15** | **τ = 0.30** | **τ = 0.45** | **τ = 0.60** | **τ = 0.75** | **τ = 0.90** |
| CWCC | 6.8588 | 8.7558*** | 4.1125*** | 8.8489*** | 4.8089 | 0.1021 | 5.6295 | 8.8141*** | 5.0243*** | 6.4269*** | 3.7980 | 0.0707 |
| | (1.4577) | (3.6031) | (3.8073) | (3.7419) | (1.8095) | (0.0818) | (0.7951) | (3.4434) | (4.3324) | (3.2157) | (1.6568) | (0.0445) |
| Controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Id | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| N | 15,789 | 15,789 | 15,789 | 15,789 | 15,789 | 15,789 | 15,789 | 15,789 | 15,789 | 15,789 | 15,789 | 15,789 |

Note: *** indicate significant at the 1% levels, respectively, with *t*-values in parentheses.

## 5.2. Cultural integration and quality of innovation

**Table 11.** Cultural integration and quality of innovation.

| | **(1)** |
|---|---|
| | IP |
| CWCC | 1.5199**<br>(1.9959) |
| Constant | −5.7727***<br>(−7.1623) |
| Controls | Yes |
| Year | Yes |
| Id | Yes |
| Industry | Yes |
| N | 15,789 |
| r2_a | 0.893 |

Note: ** and *** indicate significant at the 5% and 1% levels, respectively, with *t*-values in parentheses.

Under the wave of globalization, enterprises must constantly innovate to remain competitive. The inputs and outputs of enterprise innovation are important criteria for measuring the innovation activities of enterprises. These measures include, but are not limited to, R&D inputs, the number of patent applications, and new product releases. However, an enterprise's ability to innovate does not depend only on the inputs and outputs of innovation, but also on the quality of innovation. Even with more inputs and outputs, if the quality of innovation is not high, it is difficult to generate substantial economic benefits. Therefore, this paper further explores the relationship between

cultural integration and the quality of corporate innovation in order to deepen the research on the impact of cultural integration on corporate innovation.

Referring to [26], the natural logarithm of the average number of other citations of patent applications by firms in year n + 1 plus one is used to measure the innovation quality (IQ) of firms. The results are presented in column (1) of **Table 11**, where cultural integration and firm innovation quality are significantly positive at the 5% level, indicating that cultural integration not only promotes firm inputs and outputs, but also firm innovation quality.

## 6. Conclusions and recommendations

Against the backdrop of the process of globalization and deep socio-economic uncertainty, China is facing the challenge of moving beyond the existing mode of "material export" towards the export of ideas and culture. This requires a clear understanding of whether the positive socio-economic impact of modern Chinese culture goes beyond that of traditional culture, and how to develop a truly "contagious" doctrine. In particular, this relates to the key question of how modern culture can enhance the core competitiveness of firms—innovation. This study explores this issue in depth from both theoretical and empirical perspectives. It is found that, firstly, cultural integration centered on "degree" can effectively address the constraints of Chinese and Western cultures on firms' innovation, and thus enhance firms' innovation capability in the context of globalization. Second, executives with non-overseas backgrounds and diversified professional backgrounds play a key role in the promotion of innovation through cultural integration, as they combine a deep understanding of local culture with a global perspective to provide a richer source of thinking for corporate innovation. Third, the facilitating effect of cultural integration on innovation is more pronounced in State-owned enterprises (SOEs) and non-heavily polluted enterprises (NHEs). SOEs are driven by both their unique sense of social responsibility and economic benefits, while NHEs have relatively less environmental pressure and more innovation resources, conditions that make cultural integration more effective in promoting innovation in these enterprises. Fourth, further tests found that the impact of cultural integration on innovation is mainly concentrated on firms with average levels of innovation and more room for development, and that cultural integration can promote the quality of innovation in firms. Based on the findings, this study makes several theoretical contributions. It underscores the multifaceted role of cultural integration in driving innovation, providing empirical evidence to support the notion that cultural diversity is essential for enhancing corporate competitiveness in the global arena. Moreover, it extends the existing literature on innovation management by elucidating the specific conditions under which cultural integration is most effective.

From a practical standpoint, the study offers several recommendations for firms aiming to leverage cultural integration to bolster innovation.

First, enterprises should recognize that cultural integration is not only a social phenomenon, but also a strategic resource that can play a crucial role in tapping innovation potential and enhancing competitiveness.

This requires enterprises to take the initiative to absorb, understand and integrate different cultural elements, to broaden innovative ideas and enrich the way of problem solving. In addition, enterprises should encourage and cultivate management personnel with diversified backgrounds, whose different perspectives and experiences can provide rich ideological resources for their innovation strategies.

Second, the government should actively promote the process of cultural integration and understand and support the innovation efforts of enterprises. This can be achieved by formulating a series of policy measures, such as setting up a special fund to encourage enterprises to carry out cross-cultural research and innovation practices such as studying the characteristics of different cultures and the corresponding market needs, providing policy support such as tax breaks, and publicizing and promoting successful cases of cross-cultural innovation. Especially for state-owned enterprises and non-heavily polluting enterprises, the government can provide additional support, such as more favorable tax policies and more financial support for research and development.

Third, society should respect and appreciate cultural diversity and encourage cross-cultural exchange and learning. This can be achieved through the education system, such as incorporating learning about different cultures into school curricula to develop students' cross-cultural understanding and communication skills. In addition, social media and public platforms can also play a role, such as organizing regular cultural exchange activities to promote the unique values and aesthetics of different cultures.

**Author contributions:** Conceptualization, XW and XZ; methodology, XW; software, XW; validation, XW and XZ; formal analysis, XW; investigation, XW; resources, XW; data curation, XW; writing—original draft preparation, XW; writing—review and editing, XW; visualization, XW; supervision, XW; project administration, XW; funding acquisition, XZ. All authors have read and agreed to the published version of the manuscript.

**Conflict of interest:** The authors declare no conflict of interest.

## References

1. Wang HS, Su H. On the Concept of "Tianxia" and Worldview in Chinese and Western Civilizations. Journal of Renmin University of China. 2015; (1).
2. Huang HC. The Constraints of the Concept of "Harmony between Heaven and Man" on the Development of Ancient Chinese Science and Technology. Social Sciences Review. 2005; (4).
3. Asif M. Confucius Institute as an instrument for the promotion of Chinese public and cultural diplomacy in Pakistan. Asian Journal of Management, Entrepreneurship and Social Science. 2022; 2(03): 39–69.
4. Farh JL, Liang J, Chou LF, Cheng BS. Paternalistic Leadership in Chinese Organizations: Research Progress and Future Research Directions. In: Chen CC, Lee YT (editors). Business Leadership in China: Philosophies, Theories, and Practices. Cambridge University Press; 2008. pp. 171–205.
5. Avey JB, Avolio BJ, Crossley CD, Luthans F. Psychological Ownership: Theoretical Extensions, Measurement, and Relation to Work Outcomes. Journal of Organizational Behavior. 2009; 30(2): 173–191.
6. Li ZR. Information Psychology. Wuhan University Press; 2017.
7. Kuai ZM. Capital, Modernity, and Risk Society. Xiamen University Press; 2016.
8. Li DS. Axiology. Renmin University of China Press; 2013.

9. Dai XD. Intercultural Communication Theory. Shanghai Foreign Language Education Press; 2011.
10. Chen JF. Introduction to Chinese Culture. Nanjing University Press; 2021.
11. Liu JF, Jin DC, Chen HP. Introduction to Cultural Management. Renmin University of China Press; 2013.
12. He JX. Practical Guide to Corporate Culture Construction. Renmin University of China Press; 2019.
13. Simons T, Pelled LH, Smith KA. Making Use of Difference: Diversity, Debate, and Decision Comprehensiveness in Top Management Teams. Academy of Management Journal. 1999; 42(6): 662–673.
14. Slater DJ, Dixon-Fowler HR. CEO International Assignment Experience and Corporate Social Performance. Journal of Business Ethics. 2009; 83(3): 473–489.
15. Piaget J. The Origins of Intelligence in Children. International Universities Press; 1952.
16. Amabile TM. The Social Psychology of Creativity: A Componential Conceptualization. Journal of Personality and Social Psychology. 1983; 45(2): 357.
17. Beraki MT, Tessema MT, Dhumal P, et al. Exploring the Correlation Between Diversity and Financial Performance: An Empirical Study. International Journal of Business Performance Management. 2022; 23(1–2): 206–223.
18. Zhou L, Huang H, Chen X, Tian F. Functional Diversity of Top Management Teams and Firm Performance in SMEs: A Social Network Perspective. Review of Managerial Science. 2023; 17(1): 259–286.
19. Ding J, Li ZF, Huang JB. Can Green Credit Policy Promote Corporate Green Innovation?—From the Perspective of Policy Effect Differentiation. Journal of Financial Research. 2022; (12).
20. Bereskin FL, Campbell TLI, Hsu PH. Corporate Philanthropy, Research Networks, and Collaborative Innovation. Financial Management. 2016; 47(1): 175–206.
21. Du JW, Wei DR. A Comprehensive History of Chinese Zen Buddhism. Jiangsu: Jiangsu People's Publishing House; 2008.
22. Li X. History of the Republic of China. Zhonghua Book Company; 2011.
23. Cerioli A. Modified Targeted PCA for Measuring Spatial Concentration. Physica-Verlag; 1997. 91–110.
24. Wei Z, Zeng A, Li B. Financial Ecological Environment and Corporate Financing Constraints—An Empirical Study Based on Chinese Listed Companies. Accounting Research. 2014; (5).
25. Sun ZY, Zhou YQ, Zhang Y. Competition or Inclusiveness?—Government Incentive Policy Choices and Corporate Innovation Compliance Tendency under Policy Constraints. Accounting Research. 2021; (7).
26. Huang Y, Yang ND, Zhang CL. The Impact of Top Management Team Heterogeneity on Corporate Performance—Using Equity Concentration as a Moderating Variable. Management Review. 2011; 23(6).