Confucianism and Enterprise Assumption of Risk

Ruihan Shi

Sun Yat-sen University, Shenzhen, China
shirh8@mail2.sysu.edu.cn;shiruihan10712@foxmail.com

Pinxian Chen

Sun Yat-sen University, Shenzhen, China
chenpx35@mail2.sysu.edu.cn

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Abstract

Corporate risk-taking is a key factor in corporate decision-making, and in recent years, the influence of cultural factors as informal institutions on corporate decisions has attracted widespread attention from scholars. Confucian culture, which upholds core values such as benevolence and righteousness, forgiveness and tolerance, integrity, and loyalty and filial piety, has long permeated various levels of Chinese society. Using non-financial listed firms in China as the sample, this study measures the strength of Confucian cultural influence by the number of Confucian temples within varying distances around each firm and further explores the impact of Confucian culture on corporate risk-taking. The results show that Confucian culture is negatively associated with corporate risk-taking, indicating that in regions where Confucian culture is more deeply rooted, firms tend to exhibit lower levels of risk-taking. This study provides an in-depth empirical analysis of the factors influencing corporate risk-taking and the role of cultural factors, offering important guidance for corporate strategic development and risk management strategies while contributing to a deeper and more comprehensive understanding of the critical role of cultural factors, such as Confucian culture, in risk-taking decisions.

Keywords: Confucianism, Corporate Executives, Number of Confucian Temples, Enterprise Assumption of Risk

1 Introduction

Confucian culture, which originates from Confucian doctrines, is a traditional cultural system with a history spanning over two thousand years. In ancient China, Confucianism was regarded as the state ideology, exerting a profound influence on the cultural fabric and social evolution of the Chinese nation. The moral values advocated by Confucian culture, such as benevolence, righteousness, propriety, wisdom, and integrity, continue to resonate deeply among the people and are reflected in both daily life and business activities. In recent years, culture, as an emerging factor in the study of corporate behavior, has attracted increasing attention from scholars. However, research on the impact of Confucian culture on corporate risk-taking remains relatively limited.

In the modern market economy, enterprises play a critical role, with their business activities closely linked to various aspects of human life. Consequently, fluctuations in the operational status of firms have far-reaching implications for society. In the current era, characterized by increasing informatization, globalization, and openness, competition has become the central theme in the development of enterprises worldwide. Faced with a complex and ever-changing market environment and diversified decision-making tasks, firms must place a high priority on their capacity for risk-taking. The level of corporate risk-taking is not only a key component of firm development and operations but also enables firms to seek new drivers of business growth by seizing opportunities and taking on risks, thereby expanding their market influence and enhancing their market position. However, corporate risk-taking is not an isolated behavior; it is influenced and constrained by numerous factors. Among these, cultural factors have become a focal point of academic interest. Culture significantly impacts multiple dimensions of firm operations, a point that has been substantiated in numerous studies by scholars both in China and abroad. Existing literature has explored the importance of cultural factors on various corporate aspects, including decision-making processes (Boubakri and Saffar, 2016; Cline et al., 2021), performance (Pevzner et al., 2015), dividend policies (Shao et al., 2010; Bae et al., 2012), corporate innovation (Boubakri et al., 2021), and corporate risk-taking (Li et al., 2013). In addition, Chen et al. (2013) emphasize the need to pay attention to the evolutionary role of informal institutions throughout history when studying issues in transitional China.

This study aims to conduct an in-depth examination of the impact of Confucian culture on corporate risk-taking and its underlying mechanisms. Using data on non-financial listed firms in China from 2000 to 2023, the study measures the strength of Confucian cultural influence by analyzing the number of Confucian temples within varying distances around each firm's location. Combining this with firm-level data, the study employs fixed-effects models and heterogeneity analysis to empirically test the impact of Confucian culture on corporate risk-taking and further investigates the moderating effects of other factors on this relationship.

The contributions of this study are threefold. First, it enriches the literature on the

impact of cultural factors on corporate behavior by incorporating Confucian culture into the empirical analysis framework of corporate risk-taking, thereby extending theories on the relationship between culture and corporate behavior. Second, the study empirically verifies the negative correlation between Confucian culture and corporate risk-taking, revealing the underlying mechanism through which Confucian culture induces firms to adopt risk-averse behaviors. Third, this study further analyzes the mechanisms through which Confucian culture influences corporate risk-taking and explores the moderating effects from multiple perspectives, offering new insights into the boundary conditions of the relationship between Confucian culture and corporate risk-taking. This deepens the understanding of how Confucian culture affects corporate risk-taking and provides theoretical support for firms in formulating risk strategies as well as for policymakers in developing relevant policies.

2 Literature review

2.1 Overall characteristics of culture and Confucianism

Culture, as a collective phenomenon and internal spirit of social groups, encompasses all aspects of inheritance, creation, and development. The transmissibility of culture is one of its essential characteristics, as reflected in cross-cultural dissemination phenomena such as the "Eastern transmission of Western learning." Huang (2024) points out that regional culture exerts its influence through three mechanisms: social perceptions, social pressure, and social support. Similarly, Wei (2014) argues that the impact of local culture on the business philosophy of local firms is far greater than that of non-local culture. The influence of culture on firms manifests in two dimensions: first, through its impact on managerial decision-making, and second, as a reflection of national institutions. Li (2001) notes that Confucian culture in modern times reflects a form of Neo-Confucian conservatism. As a traditional culture and national ideology in China, Confucian culture has exerted a profound influence on generations of Chinese people through both institutional and informal channels, evolving throughout history and forming the cornerstone of Chinese civilization (Wang, 2023). Scholars studying Chinese culture have utilized measures such as the geographical distance to and density of academies, hydrological distribution, and the distribution of successful candidates in the imperial examinations to assess cultural development levels (Peng et al., 2017). Yan (2024) argues that in the new era, Confucian thought plays an important role in corporate development, with its principles of frugality and diligence helping corporate leaders set an example through their words and actions. However, some studies suggest that as a culture deeply rooted in history and aligned with a self-sufficient agrarian economy, Confucian culture inevitably possesses conservative and backward elements (Zeng, 1997). Wang et al. (2025) believe that Confucian culture affects corporate governance through two paths: in family businesses, its ethics strengthen the advantages of relationship networks, but it also brings the risk of transformation rigidity; In non-family enterprises, governance efficiency is improved by optimizing internal control, stimulating innovation, and strengthening social

responsibility.

2.2 Research on corporate risk-taking

As an important component of social activity, firms exert significant influence on both themselves and society through behaviors such as innovation and strategic decision-making. Among these, the level of corporate risk-taking serves as an indicator of a firm's willingness to take on risks and incur costs in pursuit of better performance. Jiang et al. (2024) argue that the level of corporate risk-taking directly determines the types of investment strategies adopted by firms under economic uncertainty and promotes corporate digitalization. A higher value of this indicator reflects a stronger willingness to undertake risks, leading to a greater volume of risk-related investments (Lu et al., 2015; Sun et al., 2024). Lei (2025) found that with the change of the enterprise cycle, the risk-taking of enterprises in the process of digital transformation changes in a U-shape. In the growth and depression stages, digital transformation is more effective in improving enterprise risk taking. Risk-taking drives firms in their pursuit of value opportunities, and from a value-seeking perspective, an increase in corporate risk-taking facilitates higher production efficiency, the exploration of emerging markets, and the establishment of market and competitive advantages. Zhang (2024) finds that the level of corporate risk-taking has a significant negative effect on the comparability of accounting information, indicating that higher risk-taking is associated with lower comparability of corporate accounting disclosures. John et al. (2008) find that risk-taking increases a firm's asset growth rate and sales revenue growth rate. The level of corporate risk-taking is influenced by both institutional and non-institutional factors. Previous studies on risk-taking have largely focused on accounting and agency theory perspectives, while research addressing cultural factors remains relatively limited. The measurement of corporate risk-taking itself is characterized by high flexibility, with numerous methods employed in academic research. Liu et al. (2024) consider a combination of Z-scores, non-performing loan ratios, default probabilities, and the ratio of risk-weighted assets to assess corporate risk-taking.

2.3 Relationship between Confucianism and corporate risk-taking

In academic research, Hilary et al. (2009) find that in countries with relatively cautious cultures, firms exhibit lower levels of risk-taking. More recently, Jiang et al. (2024) explore the relationship between Confucian culture and corporate innovation.

Exploring the relationship between Confucian culture and corporate risk-taking presents certain challenges in measuring the strength of Confucian cultural influence. Scholars have employed various tools to qualitatively assess the strength of cultural influence. Li (2023) finds that as the construction of Confucian academies advanced, the number of successful candidates in the imperial examinations increased, demonstrating a positive relationship between the two. Liu (2007) argues that regionally, the number of successful candidates in the imperial examinations is associated with the cultural prosperity of the area. Pan et al. (2022) analyze the impact of Confucian culture on firms by

examining the geographical distance between a firm's registered location and the center of Confucian culture, using this approach to study the role of non-institutional factors in firms. Rao et al. (2022) measure Confucian cultural influence by counting the number of Confucian temples within 100, 200, and 300 kilometers of a firm's registered location. In international studies, some scholars have measured the influence of Confucian culture by calculating the average distance from each firm to the nearest N Confucian temples (Du, 2015). In the measurement of cultural influence, many scholars have adopted qualitative approaches to examine group cultural characteristics (Tu et al., 2018). Xue et al. (2024) measure corporate risk-taking using earnings volatility, arguing that a firm's risk-taking increases as earnings volatility rises. Coles et al. (2006) suggest that the future returns on R&D investments are highly uncertain, and the proportion of R&D expenditures to total assets to some extent reflects a firm's willingness to undertake risk.

2.4 Summary on previous researches

Based on the aforementioned literature, it can be observed that existing academic research on the influence of culture on firms primarily focuses on how Confucian culture shapes corporate management philosophies, decision-making processes, and the manifestation of national institutions. Researchers have employed a variety of tools and methods to quantify the strength of Confucian culture and its impact at the firm level, including the development of Confucian academies, the number of successful candidates in the imperial examinations, and the geographical distance to a firm's registered location. Regarding the measurement of corporate risk-taking, the literature proposes various metrics, such as earnings volatility and the proportion of R&D expenditures.

Despite these advancements, existing research often overlooks the role of Confucian cultural elements and has not integrated Confucian culture with the analysis of corporate risk-taking. Moreover, the literature lacks sufficient exploration of the underlying mechanisms and pathways through which culture influences corporate risk-taking. This indicates that further in-depth research and expansion are needed in this area to better understand the relationship between cultural factors and corporate risk-taking.

3 Theoretical analysis and research hypotheses

Confucian culture, as one of the core components of traditional Chinese culture, has profoundly shaped behavioral patterns across various levels of society, particularly demonstrating significant influence in corporate decision-making. Confucian culture emphasizes the moral principles of "benevolence, righteousness, and propriety," advocating respect for tradition and the maintenance of social harmony and order (Zeng, 1997). Among these principles, "benevolence" represents care and tolerance towards others, while "righteousness" emphasizes the observance of responsibility and moral norms. These ethical concepts deeply influence both individual and collective behavioral choices. Under

the influence of Confucian culture, corporate managers tend to adopt more conservative decision-making approaches, prioritizing prudent operations and avoiding excessive risk-taking. Therefore, through its inherent moral constraints and normative functions, Confucian culture may exert a restraining effect on corporate risk-taking.

The moral principles embedded in Confucian culture provide behavioral guidelines for corporate managers, particularly in decisions related to risk-taking. Confucian culture advocates for a stable and harmonious social environment and emphasizes long-term benefits over short-term high-risk, high-return pursuits (Sun, 2021). Corporate risk-taking behavior typically refers to how firms allocate limited resources and decide whether to engage in high-risk projects when faced with significant uncertainty. While higher risk levels may yield greater investment returns, they are also accompanied by a higher likelihood of failure (Fang, 2020). However, under the influence of Confucian culture, firms often place greater emphasis on ethics and responsibility, tending to avoid excessive risk-taking. This emphasis on stability and caution inherent in Confucian culture leads firms to adopt more conservative attitudes in the face of innovation and uncertainty, thereby avoiding overly aggressive decision-making.

Secondly, the Confucian concept of "the unity of heaven and humanity" advocates for the harmonious integration of humans with nature and society (Wei, 2016). This philosophical perspective emphasizes aligning human actions with the laws of nature and society while promoting rationality and moderation, which also plays a role in corporate decision-making. When faced with complex risks and uncertainties in the market, Confucian culture tends to emphasize stability, harmony, and prudence, discouraging the blind pursuit of high-risk activities for short-term high returns. Consequently, under the influence of Confucian culture, firms adopt a relatively cautious attitude toward risk, preferring to choose stable operational strategies to avoid the uncertainties and potential losses associated with rapid changes.

From the corporate research perspect, researchers also give high importance to cultural influence on corporate management. Han (2025) believes that the construction of corporate culture is an important part of enterprise management, which is related to the economic development of enterprises and the improvement of core competitiveness in the market. Doing a good job in the construction of corporate culture has a positive effect on enhancing the centripetal force of the enterprise, guiding the direction of development, preventing business risks, promoting sustainable development and improving management efficiency. Wang and Sui (2010) proposed a new dualism of internal control elements of "control structure + corporate culture". The internal control composed of these two elements has (1) equal emphasis on economic control and cultural control; (2) The characteristics of both institutionalism and humanism. Zheng (2010) proposed that corporate culture determines the direction of the enterprise and the height of its achievements, while the implementation of enterprise management determines the implementation and inheritance of corporate culture, ensuring the coordination and smoothness of

enterprise operations.

Moreover, throughout Chinese history, many merchants and entrepreneurs have regarded Confucian ethics as an essential guideline for business activities, emphasizing core values such as "benevolence," "trustworthiness," and "righteousness," which highlight the importance of integrity, responsibility, and a harmonious business environment (Chao, 2011). These moral principles further reinforce risk-averse behaviors by constraining corporate actions. Cai et al. (2023) point out that the conservatism inherent in Confucian culture and its emphasis on social stability profoundly influence the behavioral patterns of Chinese firms. Particularly when faced with market competition and the pressures of innovation, firms tend to adhere to traditional values rather than pursue aggressive risk-taking investments.

Based on the above analysis, this study proposes the following research hypothesis:

H1: Confucian culture, through its advocacy of core values such as "benevolence, righteousness, and trustworthiness" and its strong moral constraints, suppresses the level of corporate risk-taking.

Within firms, top executives play a critical role in shaping strategic decisions and operational directions, particularly regarding risk-taking and innovation activities. Executive compensation, as a key component of corporate governance, is closely related to managerial decision-making behavior. When facing high-risk projects, compensation disparities and executives' risk preferences often become important factors influencing decisions. Research has shown that Confucian culture can restrain executives' self-interested motivations, thereby effectively reducing agency costs and improving agency efficiency (Chen et al., 2020; Lü, 2024). Confucian culture emphasizes moral values such as self-cultivation and self-discipline, which encourage executives to pay greater attention to self-restraint and moral constraints in their decision-making. Consequently, when faced with high-risk decisions, Confucian culture may lead executives to adopt a more cautious stance, preferring to avoid high-risk, high-return investment decisions.

Specifically, the concepts of "benevolence, righteousness, and trustworthiness" and the doctrine of the "Golden Mean" within Confucian culture play a significant role in influencing executives' decisions. As Confucian culture emphasizes harmony and stability, these values may result in executives exhibiting lower risk tolerance when facing the high risks associated with innovation, thereby affecting corporate innovation efficiency and risk-taking behavior. Lü (2024) points out that the influence of Confucian culture reduces executives' excess compensation, thereby weakening their motivation to pursue short-term gains and reducing their willingness to undertake high-risk activities. Additionally, the advocacy of moderation and self-restraint in Confucian thought encourages executives to adopt more prudent decision-making approaches, avoiding investment projects that, while having a positive net present value, are characterized by high risk and long investment cycles, such as mergers and acquisitions or innovation-driven invest-

ments (Xu et al., 2024).

In modern business theories, Hofstede et al. (1991) pointed out that cultural factors such as individualism and collectivism, power distance and cooperation have a significant impact on the business performance of enterprises, and cultural factors can well explain the differences in the size of enterprises in different countries. Guo (2006) further internalized the conclusions in the Chinese environment.

Moreover, Confucian culture exerts its influence on corporate decision-making through a "culture–attitude–behavior" chain, shaping attitudes that translate into behaviors and subsequently affecting decisions at the organizational level (Breuer et al., 2012). Research has shown that individual characteristics of corporate executives, such as gender, educational background, capabilities, and overconfidence, significantly impact corporate risk-taking. Confucian culture, by influencing executives' values and decision-making styles, may lead to differences in risk preferences compared to other entrepreneurs (Wang, 2024). Therefore, in regions with strong Confucian cultural influence, corporate executives often exhibit a higher degree of risk aversion, thereby reducing the overall level of corporate risk-taking.

Based on the above theoretical mechanism, this study proposes the following hypothesis:

H2: Confucian culture, by imposing moral constraints on corporate executives, reduces their self-interested motivations and influences their framing biases, thereby decreasing the level of corporate risk-taking.

Confucian culture, as a traditional cultural system emphasizing harmony, stability, and social responsibility, profoundly influences corporate behavioral patterns. The core values of Confucianism, such as "benevolence," "righteousness," and "trustworthiness," emphasize individual and societal responsibilities, aligning closely with the concept of corporate social responsibility (CSR). CSR underscores that firms should go beyond the short-term pursuit of profit to undertake long-term responsibilities toward society and the environment, thereby achieving sustainable development. Many scholars argue that the influence of Confucian culture encourages firms to place greater emphasis on moral constraints and social responsibility, particularly reflected in the strong sense of social responsibility demonstrated in managerial decision-making (Pan et al., 2021; Chen et al., 2025).

Specifically, the influence of Confucian culture on executive behavior holds significant implications. Zhao (2020) believes that corporate culture plays an important role in enterprise management and has a significant impact on enterprise management. These effects roughly include: cohesion, motivation and constraints. Modern enterprise competition is increasingly dependent on the strength of corporate culture. Confucianism advocates for "self-cultivation and moral refinement," a value system that encourages ex-

ecutives to pay closer attention to the social and environmental impacts of their decisions rather than focusing solely on economic benefits. This tendency not only helps firms enhance their sense of social responsibility but also promotes more cautious and conservative approaches in resource allocation and decision-making processes, thereby reducing the preference for high-risk, high-return investments (Lu, 2024). Against this backdrop, the influence of Confucian culture, through fostering greater corporate social responsibility, indirectly restrains high-risk behaviors within firms and reduces their overall level of risk-taking.

Building on existing research, the undertaking of corporate social responsibility (CSR) can enhance a firm's transparency and social trust, thereby reducing managerial moral hazard and irresponsible behaviors (Li et al., 2019; Li et al., 2021). The implementation of CSR not only improves a firm's public image but also reduces potential risks arising from a lack of social responsibility, aligning with the Confucian emphasis on harmony and stability.

Based on the above analysis, this study proposes the following hypothesis:

H3: Confucian culture, by emphasizing the undertaking of corporate social responsibility, influences executives' mental accounting and social preferences, thereby indirectly restraining the level of corporate risk-taking.

4 Research design

4.1 Sample Selection Criteria: Data on Confucian Culture

The influence of culture on business has received significant scholarly attention. Within the Chinese context, prior studies have examined the relationship between regional merchant cultures and business development, arguing that business culture and the associated regional entrepreneurial spirit play a critical role in shaping commercial growth (Jiang, 2024). Additionally, a growing body of literature has explored the impact of regional culture (Wang, 2024) and Confucian culture (Yan, 2024) on corporate activities. Building upon these studies, this paper selects regions where Confucian culture has historically disseminated—specifically, prefecture-level cities that have produced *jinshi* (successful candidates in the highest imperial examinations) since the Ming Dynasty—as the focal areas for analysis.

This study utilizes data from the China Research Data Services Platform (CNRDS) and determines the locations of existing Confucian temples through Wikipedia and mapping applications. Based on their longitude and latitude coordinates, the geographical distances between the registered locations of firms and Confucian temples are calculated using the Earth's radius, as shown in the formula below:

$$C = \cos(\beta_1) \cdot \cos(\beta_2) \cdot \cos(\alpha_1 - \alpha_2) + \sin(\beta_1) \cdot \sin(\beta_2) \quad (1)$$

Here, C denotes the cosine value of the central angle between two points on the Earth's surface. Based on these calculations, the number of Confucian temples within radii of 100 km, 200 km, and 300 km from the firm's registered location is computed, and the logarithmic transformation of these counts is employed in the regression analyses.

In addition to using the number of Confucian temples around firms as the primary measure of Confucian cultural influence, this study employs the number of *jinshi* (successful candidates in the highest imperial examinations during the Ming and Qing Dynasties) as an alternative proxy for robustness checks. As the highest honor in the ancient imperial examination system, the *jinshi* title represents a direct manifestation of Confucian culture. The content of the imperial examinations was deeply rooted in Confucian classics, and achieving *jinshi* status not only signified academic excellence but also demonstrated a profound understanding and acceptance of Confucian ideology. Since its institutionalization during the Sui and Tang Dynasties, the imperial examination system became an essential cultural and social mechanism in Chinese society, making the number of *jinshi* an indicator of the degree to which local societies valued and perpetuated Confucian cultural traditions. By analyzing the number of *jinshi*, this study can intuitively capture the historical influence of Confucian culture in a given region.

The number of *jinshi* reflects not only the level of educational development in a locality but, more importantly, the degree of Confucian cultural penetration within the region. Historically, Confucian culture has emphasized moral cultivation and social responsibility, and *jinshi*, as exemplary scholars of Confucian teachings, often carried the mission of disseminating Confucian thought. A higher count of *jinshi* indicates a region's longstanding reverence for and adherence to Confucian teachings, suggesting that Confucian values are widely accepted and transmitted within the cultural atmosphere of the locality. Therefore, the number of *jinshi* serves not only as a symbol of academic achievement but also as a reflection of social values and cultural norms within a region.

In addition to the number of *jinshi*, the number of academies (*shuyuan*) is also employed as another important proxy for measuring the influence of Confucian culture. As a vital vehicle for the transmission of traditional Chinese culture, academies historically played a crucial role in cultivating scholars. Academies not only served as centers for the dissemination of Confucian academic thought but also functioned as venues for scholarly exchange and moral cultivation among the scholar-official class. The development of academies has been closely tied to Confucian culture, especially after the Song Dynasty, when academies gradually became centers for the dissemination of Confucian teachings and scholarly debate, with many of their academic activities centered around Confucian classics. Therefore, the number of academies can effectively reflect the depth and societal recognition of Confucian cultural heritage within a particular region or period. In this

study, the number of academies in various regions is identified using data from Wikipedia and mapping applications, serving as an additional indicator of Confucian cultural influence.

4.2 Data Source: Chinese Listed Firms

The sample period of this study spans from 2000 to 2023. The initial sample includes all non-financial state-owned enterprises listed on the Shanghai and Shenzhen Stock Exchanges after 2000, excluding firms in the capital market services and insurance industries. Data on firm characteristics are obtained from the *China Statistical Yearbook*, the *National Bureau of Statistics of China*, and the CSMAR database. To mitigate the influence of outliers, the main continuous variables are winsorized at the 1% and 99% levels.

4.3 Model specification

This study utilizes a sample comprising data on nearly 10,000 listed firms across various prefecture-level cities in China, incorporating measures of the number of Confucian temples within different distance scales around each firm's registered location. A fixed effects model controlling for year and industry is employed to test the proposed hypotheses. This approach helps to mitigate the potential confounding effects arising from variations across years and industries on firms' risk-taking behaviors, thereby addressing potential insignificance caused by unobserved heterogeneity. Additionally, standard errors are clustered at the firm registration location to account for spatial correlations.

The regression model is specified as follows:

$$Risk1_{i,t} = \alpha_0 + \alpha_1 Conf\_N_{i,t} + \sum_j \beta_j Control_{j,i,t} + Industry + Year + e_{i,t} \qquad (2)$$

In this study, Risk1 represents the level of corporate risk-taking. Following prior research (John et al., 2008; Faccio et al., 2011), we measure firms' risk-taking using the volatility of profitability, specifically the standard deviation of return on assets, $\sigma(ROA)$. Here, $ROA_{i,t}$ denotes the ratio of EBITDA to total assets at the end of year t for firm i. To eliminate industry-specific effects on firm ROA, we first adjust each firm's annual ROA by subtracting the industry average for that year, obtaining the industry-adjusted ROA. We then define $Risk1_{i,t}$ as the rolling standard deviation of the industry-adjusted ROA over each five-year observation window during our study period.

The key explanatory variable in this study is the number of Confucian temples within a specified radius of the firm's registered location, which is used to measure Confucian cultural intensity. We define $Conf_N$ where N takes values of 100, 200, and 300, representing the intensity of Confucian culture within 100km, 200km, and 300km , respectively, around the firm's registered location. The sample period covers the years 2000

to 2023.

The variable Control represents a set of control variables that capture determinants of corporate risk-taking, following previous research (Xue et al., 2024). Specifically, we include the following variables: firm listing age (*age*), defined as the time elapsed from the firm's listing date to the current date; firm size (*size*), measured as the natural logarithm of total assets; Tobin's Q (*TobinQ*), calculated as the ratio of market value to total assets; cash flow (*Cflow*), defined as the ratio of net cash flow from operating activities to total assets; total debt ratio (*Assetratio*), calculated as total debt divided by total assets; the shareholding ratio of the largest shareholder (*LargestHolder*); the natural logarithm of regional GDP (*Ln_GDP*); and the Herfindahl-Hirschman Index (*HHI_A_*), which measures market concentration and is calculated as the sum of the squares of the revenue shares of the firm's main business segments. All variables are defined to facilitate an in-depth analysis of firms' financial and market performance while controlling for industry fixed effects.

Table 1: Variable definition

Variables	Definition
$Risk1_{i,t}$	The level of corporate risk-taking, measured by the three-year rolling standard deviation of industry-adjusted ROA
Conf_N	The number of Confucian temples within a radius of N kilometers around the firm's registered location
age	Listing age, equal to the number of years the firm has been listed
size	Firm size, equal to the natural logarithm of total assets in year t
TobinQ	Tobin's Q, equal to the ratio of the firm's market value to its total assets
cflow	Cash flow, equal to the ratio of net cash flow from operating activities to total assets
Turnover	Total asset turnover, equal to the ratio of operating revenue to total assets
Assetratio	Total debt ratio, equal to the ratio of total debt to total assets
Largestholer	Shareholding ratio of the largest shareholder
HHI_A	Herfindahl-Hirschman Index, used to measure market concentration, calculated as the sum of the squares of the revenue shares of the firm's main business segments
ln_GDP	Natural logarithm of GDP, representing the natural logarithm of the GDP of the region where the firm is registered
$jinshi\_number$	The number of Jinshi during the Ming and Qing dynasties in the city where the firm is registered
$jinshi\_off$	The number of Jinshi during the Ming and Qing dynasties in the city where the firm's senior executive (chairman) was born
$shuyuan\_number$	The number of existing academies in the city where the firm is registered
$shuyuan\_off$	The number of existing academies in the city where the firm's senior executive (chairman) was born.
ESG	From Huazheng ESG evaluation data
$overpay$	Excess executive compensation

4.4 Descriptive statistics

From the descriptive statistics, corporate risk-taking (Risk1) exhibits considerable variation, with a mean of 2.97 and a standard deviation as high as 121.87, which may reflect differences among firms in their attitudes toward risk. Conf_100 (the number of Confucian temples within 100 kilometers around the firm) has a mean of 6.60 and a standard deviation of 4.08, with a minimum of 0 and a maximum of 24, indicating significant variation in the distribution of Confucian temples. The data for Conf_200 and Conf_300 show similar patterns. The mean value of age (years since listing) is 9.34, indicating that most firms in the sample are relatively young. The mean value of LargestHolder is 36.328,

with a standard deviation of 16.993, suggesting considerable variation in the shareholding ratios of the largest shareholders. Overall, the sample shows noticeable differences across control variables, providing good variability for analysis.

Table 2: Descriptive statistics

Variable	Obs	Mean	Std. dev.	Min	Max
$Risk1_{i,t}$	27,426	2.974994	121.8687	0.0009606	8467.216
Conf_100	40,437	6.596162	4.076354	0	24
Conf_200	40,437	16.94352	8.890538	0	58
Conf_300	40,437	29.9337	14.55668	0	108
age	40,437	9.340431	7.263234	0	27
size	40,437	22.04782	1.430627	19.12068	26.84705
TobinQ	40,437	2.19867	1.802266	0.861077	8.865074
cflow	40,437	0.0458266	0.0757043	-0.199337	0.2644009
Turnover	40,392	0.6500478	0.5984919	-0.050205	36.02262
Assetratio	40,437	0.4570447	0.2217271	0.055711	1.122302
Largestholder	40,437	36.32806	16.99316	8.41	74.35
HHI_A	40,437	0.2434775	0.2522599	0.039941	1
ln_GDP	40,437	8.822195	1.253588	3.613078	10.71017
ESG	30,510	4.106039	1.000143	1	8

5 Baseline regression

Table 2 presents the baseline regression results after controlling for industry and year fixed effects. Columns (1)–(3) measure the influence of Confucian culture using the number of Confucian temples within 100 km, 200 km, and 300 km around each firm's registered location, respectively. Columns (4)–(6) further include city-level controls such as GDP per capita to account for regional economic characteristics.

Across all specifications, the estimated coefficients of Confucian culture variables (*Conf_100*, *Conf_200*, and *Conf_300*) are significantly negative, indicating that firms located in areas with stronger Confucian cultural influence tend to exhibit lower levels of corporate risk-taking. For example, in column (1), the coefficient of *Conf_100* is –0.0319 and significant at the 5% level, suggesting that a one-unit increase in the number of nearby Confucian temples is associated with a decline in firms' risk-taking levels. The results remain robust when the radius expands to 200 km and 300 km, as shown in columns (2) and (3). After controlling for city-level factors in columns (4)–(6), the coefficients remain negative and statistically significant, confirming the robustness of the relationship.

These findings suggest that Confucian culture exerts a stabilizing and restraining influence on corporate behavior. Regions with denser Confucian temples—historical carriers of moral education and social norms—tend to cultivate managerial prudence and discourage excessive risk-taking. This interpretation is consistent with Confucian principles of "moderation" and "acting prudently," which promote stability and discourage

speculative decision-making.

Although Confucian temples are historical artifacts, their geographic distribution reflects the long-term persistence of Confucian influence in local societies. Consistent with cultural economics literature emphasizing the intergenerational transmission of cultural norms (e.g., Tabellini, 2010; Chen et al., 2021), these temples can be viewed as a spatially rooted proxy for enduring Confucian values that continue to shape firms' behavioral tendencies today.

Overall, Table 2 provides strong evidence supporting Hypothesis : Confucian culture significantly restrains corporate risk-taking.

Table 3: Baseline regression result

	(1) Risk1	(2) Risk1	(3) Risk1	(4) Risk1	(5) Risk1	(6) Risk1
Conf_100	-0.0319**			-0.0274**		
	(0.0148)			(0.0118)		
Conf_200		-0.0143**			-0.0141**	
		(0.00678)			(0.00663)	
Conf_300			-0.00415**			-0.00506**
			(0.00175)			(0.00224)
age	0.0113	0.0122*	0.0107	0.0115	0.0127*	0.0115*
	(0.00696)	(0.00686)	(0.00693)	(0.00700)	(0.00694)	(0.00695)
size	0.0220	0.0126	0.0149	0.0313	0.0255	0.0283
	(0.0523)	(0.0488)	(0.0502)	(0.0600)	(0.0577)	(0.0591)
TobinQ	0.112**	0.111**	0.110**	0.114**	0.114**	0.114**
	(0.0486)	(0.0482)	(0.0481)	(0.0509)	(0.0508)	(0.0508)
cflow	0.371	0.409	0.408	0.308	0.323	0.315
	(1.210)	(1.206)	(1.208)	(1.225)	(1.223)	(1.226)
Turnover	-0.111*	-0.112*	-0.125*	-0.104*	-0.0990*	-0.109*
	(0.0637)	(0.0635)	(0.0685)	(0.0602)	(0.0583)	(0.0615)
Assetratio	0.549**	0.570**	0.585**	0.517*	0.525*	0.538**
	(0.266)	(0.264)	(0.263)	(0.270)	(0.268)	(0.268)
Largestholder	0.00209	0.00192	0.00166	0.00247	0.00249	0.00229
	(0.00257)	(0.00258)	(0.00261)	(0.00250)	(0.00250)	(0.00251)
HHI_A	-2.301	-2.319	-2.322	-2.294	-2.307	-2.308
	(1.857)	(1.860)	(1.861)	(1.853)	(1.854)	(1.855)
City FE				Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	27426	27426	27426	27426	27426	27426

Standard errors in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

6 Robustness test

6.1 Instrumental variable approaches

To address potential endogeneity issues in the analysis, this study employs an instrumental variable approach to mitigate the potential bias arising from omitted variables that may simultaneously affect corporate risk-taking and the cultural background. According to the research by Kung and Ma, Confucian culture can significantly suppress the occurrence of wars. In the reverse logic, regions with more severe rebellions provided stronger incentives for feudal regimes to construct Confucian temples to enhance local residents' loyalty to the dynasty. The "Mancheng" (Manchu Garrisons) served as military organizations and entities established by the Qing Dynasty to suppress rebellions, and their presence reflects both the occurrence of local rebellions and the Qing government's efforts to pacify them. Due to the educational and moral influence of Confucian culture, the extent of local rebellions during the Qing Dynasty was closely related to the construction of Confucian temples.

Based on this logic, this study uses the presence of "Mancheng" as an instrumental variable to proxy for the degree of local rebellion. Specifically, provinces that once had "Mancheng" are assigned a value of 1, while those without "Mancheng" are assigned a value of 0. Regarding data selection, we refer to the "Imperially Commissioned General Annals of the Eight Banners: Treatise on Construction," which documents 11 Mancheng locations, including Taiyuan Mancheng, Xi'an Mancheng, Ningxia Mancheng (Yinchuan), Liangzhou Mancheng (Wuwei), Tongguan Mancheng, Chengdu Mancheng, Jingzhou Mancheng, Jiangning Mancheng (Nanjing), Hangzhou Mancheng, Qingzhou Mancheng, and Kaifeng Mancheng, as well as other garrison-type Mancheng such as those in Guangzhou and Fuzhou. By employing this instrumental variable, we can effectively address potential endogeneity between Confucian culture and corporate risk-taking. This is particularly important in regions with a history of political turmoil, where Confucian temples constructed under special circumstances may further exacerbate estimation biases.

Table 4 presents the robustness checks using the instrumental variable approach. First, the first-stage regression results in Panel A indicate that the "Mancheng" variable is significantly positively correlated with the number of Confucian temples within different distance ranges, with coefficients significant at the 1% level, confirming the validity of "Mancheng" as an instrumental variable. In the first stage, "Mancheng" as an instrument can significantly predict the number of Confucian temples (Conf_100, Conf_200, Conf_300), and the F-statistics exceed 10, meeting the instrument validity criteria proposed by Stock and Yogo (2005).

The second-stage regression results in Panel B further reveal the impact of the number of Confucian temples on corporate risk-taking. Specifically, column (2) shows that within a 100 km radius, the number of Confucian temples is significantly negatively

correlated with corporate risk-taking, with a coefficient of -0.0967, significant at the 10% level. Columns (3) and (4) also show a significant negative relationship between the number of Confucian temples and corporate risk-taking. This result indicates that the influence of Confucian culture, as reflected by the increased number of Confucian temples, significantly suppresses corporate risk-taking, supporting the view that Confucian culture emphasizes prudence and risk avoidance.

Table 4: IV robustness test

Explanatory variable	(1) Conf_100	(2) Risk1	(3) Conf_200	(4) Risk1	(5) Conf_300	(6) Risk1
Panel A. first stage result						
mancheng	0.510*		1.710**		3.387**	
	(0.283)		(0.772)		(1.370)	
Panel B. second stage result						
Conf_100		-0.0967*				
		(0.0523)				
Conf_200				-0.0289**		
				(0.0145)		
Conf_300						-0.0146*
						(0.00811)
Enterprise controls	Yes	Yes	Yes	Yes	Yes	Yes
City controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	27426	27426	27426	27426	27426	27426

Standard errors in parentheses, * p < 0.1, ** p < 0.05, *** p < 0.01

The results of the instrumental variable regressions are consistent with the conclusions of the baseline model, indicating that potential endogeneity issues have a limited impact on the estimation results. The above findings further confirm the restraining effect of Confucian culture on corporate risk-taking while also highlighting the importance of cultural factors in corporate development and strategic planning. Utilizing historical phenomena as instrumental variables effectively addresses the endogeneity problem and provides robust evidence for the suppressive effect of Confucian culture on enterprise assumption of risk.

6.2 Changing the measurement method of enterprise assumption of risk

To verify the robustness of the baseline findings, this subsection redefines the measurement of corporate risk-taking. In the baseline model, risk-taking was captured by the five-year rolling standard deviation of firms' return on assets (ROA), which reflects long-term strategic variability in profitability. To ensure that the observed effect of Confucian culture is not sensitive to the measurement window, we replace it with a three-year rolling standard deviation of ROA, which captures shorter-term fluctuations in firms' operating performance. This adjustment allows us to test whether Confucian culture consistently influences firms' risk-taking behavior across different temporal horizons.

The regression results are reported in Table 5. Across all columns, the coefficients of Confucian culture variables (*Conf_100*, *Conf_200*, and *Conf_300*) remain significantly negative, indicating that the restraining effect of Confucian culture on corporate risk-taking is robust to alternative definitions of the dependent variable. Specifically, within a 100 km radius, the estimated coefficient of *Conf_100* is –0.000634 and significant at the 1% level, suggesting that even when risk-taking is measured using a shorter time window, the negative association between Confucian influence and corporate risk-taking remains stable. Similar results are obtained for the 200 km and 300 km measures, where the coefficients remain negative and statistically significant.

These results imply that the influence of Confucian culture is not a transient effect limited to long-term performance variability, but a persistent behavioral tendency shaping firms' decision-making at both medium- and short-term horizons. In regions with stronger Confucian traditions, managers may adhere more closely to the principles of prudence and stability emphasized in Confucian ethics, leading to consistently lower levels of risk-taking regardless of the measurement window.

Furthermore, the signs and magnitudes of the control variables are consistent with the baseline regression, reinforcing the stability of the model. Firm age and size are negatively correlated with risk-taking, implying that more mature and larger firms tend to pursue safer strategies. In contrast, Tobin's Q remains positively associated with risk-taking, reflecting that firms with greater investment opportunities are more willing to engage in riskier activities. The persistence of these relationships across different model specifications provides additional support for the robustness of the empirical framework.

Overall, the results in Table 5 confirm that the negative association between Confucian culture and corporate risk-taking is not driven by the specific method used to measure risk-taking. The effect remains statistically and economically significant when alternative temporal definitions are applied. In the following robustness tests, we further expand the analysis by introducing additional measures of corporate risk-taking, such as the volatility of return on equity (ROE) and the variance of firms' investment growth, to provide a more comprehensive validation of our findings.

Table 5: Roubustness test on changing the measurement of enterprise assumption of risk

	(1)Risk	**(2)Risk**	**(3)Risk**
Conf_100	-0.000634**		
	(0.000279)		
Conf_200		-0.000331***	
		(0.000113)	
Conf_300			-0.000172**
			(0.0000792)
age	-0.00493***	-0.00491***	-0.00492***
	(0.000207)	(0.000207)	(0.000177)
size	-0.00690***	-0.00689***	-0.00678***
	(0.00189)	(0.00188)	(0.00235)
TobinQ	0.0117***	0.0117***	0.0117***
	(0.000761)	(0.000760)	(0.000855)
Cflow	-0.0714***	-0.0709***	-0.0708***
	(0.0127)	(0.0127)	(0.0157)
Turnover	-0.00736***	-0.00728***	-0.00731***
	(0.00247)	(0.00246)	(0.00280)
Assertratio	0.0557***	0.0556***	0.0557***
	(0.00781)	(0.00780)	(0.00911)
Largestholer	-0.000409***	-0.000411***	-0.000414***
	(0.0000939)	(0.0000939)	(0.000109)
HHI_A	0.0456***	0.0452***	0.0450***
	(0.00956)	(0.00957)	(0.0141)
City FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	40392	40392	40392

Standard errors in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

6.3 Changing the measurement method of Confucianism culture

Culture is characterized by its embeddedness. As a form of informal arrangement, Confucian culture, based on the "culture–attitude–behavior" influence chain, extends from attitudes to behaviors and ultimately to the corporate level, resulting in specific economic outcomes. Zhao Longkai et al. (2014) found that cultural characteristics have differentiated effects on corporate risk-taking behaviors. Culture shapes individuals' mental frameworks, and entrepreneurs born in regions with strong Confucian cultural presence are likely to possess more Confucian cultural traits. Due to the influence of various factors, entrepreneurs have different attitudes toward risk, and their risk preferences and

risk-avoidance tendencies vary significantly. Existing literature, based on upper echelon theory, has examined the impact of different executive characteristics on corporate risk-taking, finding that traits such as gender, education, ability, and overconfidence affect risk-taking.

In the robustness test, we changed the measurement of Confucian culture by using the number of Jinshi (successful candidates in the highest imperial examinations) and the number of academies during the Ming and Qing dynasties in both the firm's registration location and the executives' birthplace as proxies for Confucian cultural influence. This adjustment aims to further verify whether the impact of Confucian culture on corporate risk-taking remains stable and to explore how different cultural characteristics specifically influence corporate risk-taking.

The regression results presented in the table show that the relationship between the number of Jinshi and enterprise assumption of risk (Risk1) remains significantly negative. Column (1) indicates that the coefficient for the effect of the number of Jinshi on enterprise assumption of risk is -0.00000857, significant at the 1% level, suggesting that in regions with a higher number of Jinshi, firms exhibit lower levels of enterprise assumption of risk. Similarly, column (2) presents the impact of the number of Jinshi in executives' birthplaces on corporate risk-taking, with a coefficient of -0.0000133, also significant at the 1% level, indicating that differences in cultural backgrounds in executives' birthplaces have a certain impact on corporate enterprise assumption of risk. This suggests that entrepreneurs born in regions with strong Confucian cultural presence tend to be more conservative and are inclined to adopt lower-risk corporate strategies.

Columns (3) and (4) further validate the impact of the number of academies in the registration location and the executives' birthplace on enterprise assumption of risk. Specifically, the coefficients for the number of academies in the registration location and birthplace are -0.000117 and -0.000242, respectively, both of which are significant, indicating that the cultural environment where the firm is located and the personal cultural background of executives have a significant influence on enterprise assumption of risk. In comparison, the impact of the number of academies on enterprise assumption of risk is slightly lower than that of the number of Jinshi, but it remains significant.

By changing the measurement of Confucian culture, it is shown that altering the proxy for Confucian culture does not significantly change the main conclusions of the model, and the negative impact of Confucian culture on corporate risk-taking remains. This demonstrates that regardless of whether the number of Jinshi, the number of academies, or other cultural indicators are used, the influence of Confucian culture on corporate risk-taking is robust and consistent. Through this robustness check, we further verify the important impact of cultural background on entrepreneurs' decision-making behaviors, particularly in terms of corporate risk-taking.

Table 6: Robustness check on changing explanatory variable

	(1) **Risk1**	(2) **Risk1**	(3) **Risk1**	(4) **Risk1**
jinshi number	-0.00000857*** (0.00000242)			
jinshi off		-0.0000133*** (0.00000284)		
shuyuan number			-0.000117* (0.0000691)	
shuyuan off				-0.000242* (0.000134)
Enterprise controls	Yes	Yes	Yes	Yes
City controls	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	9313	9313	19693	3699

Standard errors in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

6.4 Controlling COVID-19 influence

This study utilizes data covering the period from 2000 to 2023. However, the data from 2020 to 2023 may have been affected by the COVID-19 pandemic. To test the robustness of the baseline results, we restricted the sample to the period prior to 2020 and re-estimated the core model.

The estimation results of models (1), (2), and (3) in Table 7 indicate that even when excluding data potentially influenced by the pandemic, an increase in the number of Confucian temples around a firm's registration location continues to significantly suppress the level of Enterprise Assumption of Risk. By narrowing the time frame to eliminate possible COVID-19 effects, the results further confirm the robustness of the negative relationship between Confucian culture and Enterprise Assumption of Risk. In other words, even after removing pandemic-related disturbances, the cultural variable—measured by the number of Confucian temples—maintains its statistically significant inhibitory effect on firms' Enterprise Assumption of Risk.

Table 7: Roubustness check on controlling COVID-19 influence

	(1) **Risk1**	(2) **Risk1**	(3) **Risk1**
Conf_100	-0.000294* (0.000163)		
Conf_200		-0.000173* (0.0000887)	
Conf_300			-0.000153*** (0.0000529)
Enterprise controls	Yes	Yes	Yes
City controls	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	30823	30823	30823

Standard errors in parentheses, * p < 0.1, ** p < 0.05, *** p < 0.01

7 Mechanism analysis

7.1 Corporate ESG performance effects

Previous studies (He, Feng, et al., 2023) have shown that corporate Environmental, Social, and Governance (ESG) performance has a significant suppressive effect on corporate risk-taking. As a deeply rooted social and cultural tradition, Confucian culture emphasizes values such as morality, social responsibility, collective interests, and long-term vision, which are highly aligned with the core components of ESG—Environmental, Social, and Governance. Therefore, this study uses the annual average of the corporate ESG scores estimated by Huazheng as the standard for measuring corporate ESG performance, aiming to further examine the mechanism through which Confucian culture affects corporate risk-taking by analyzing the mediating effect of corporate ESG performance.

Panel A of Table 8 primarily examines the impact of Confucian culture on corporate ESG scores. According to the regression results in Panel A, there is a significant positive relationship between Confucian culture and corporate ESG scores. Specifically, Conf_100 (representing the number of Confucian temples within 100 kilometers of the firm's registered location) has an estimated coefficient of 0.0159 on corporate ESG scores, which is significant at the 5% level. This result indicates that firms located in regions with a strong Confucian cultural presence tend to have higher ESG scores, which may stem from the ethical and social responsibility values advocated by Confucian culture, encouraging firms to pay more attention to environmental protection, social responsibility, and governance structure. Similarly, Conf_200 and Conf_300 also have significant positive

effects on corporate ESG scores at the 3% and 1% significance levels, respectively, further demonstrating the broad influence of Confucian culture on enhancing corporate ESG performance.

Further mechanism testing shows that when corporate ESG performance is included as a mediating variable, the direct impact of Confucian culture on corporate risk-taking weakens. In the regression results of Panel B, each one-unit increase in ESG scores is associated with a reduction in corporate risk-taking of approximately 0.00793 to 0.00806 units, and these results are highly significant at the 1% level. This indicates that as firms improve their ESG performance, they may adopt more prudent operational strategies, thereby reducing risk-taking. After accounting for the mediating effect of ESG scores, the influence of Confucian culture on corporate risk-taking significantly weakens, and the level of significance also declines. This change suggests that Confucian culture encourages firms to enhance their sense of social responsibility and governance standards, which, in turn, helps firms adopt a more cautious approach in risk management and decision-making. Therefore, ESG scores play a significant mediating role in the relationship between Confucian culture and enterprise assumption of risk.

Table 8: ESG effects

	(1) ESG	(2) Risk1	(3) ESG	(4) Risk1	(5) ESG	(6) Risk1
Panel A. Confucian influence on ESG						
Conf_100	0.0159**					
	(0.00709)					
Conf_200			0.00837***			
			(0.00282)			
Conf_300					0.00446***	
					(0.00169)	
Panel B. Confucian and ESG influence on EAR						
ESG		-0.00806***		-0.00798***		-0.00793***
		(0.00248)		(0.00252)		(0.00250)
Conf_100		-0.0000780				
		(0.000348)				
Conf_200				-0.000136		
				(0.000155)		
Conf_300						-0.000140
						(0.0000985)
Enterprise controls	Yes	Yes	Yes	Yes	Yes	Yes
City controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5725	5725	5725	5725	5725	5725

Standard errors in parentheses, * p < 0.1, ** p < 0.05, *** p < 0.01 , EAR= enterprise assumption of risk

7.2 Executive Excess Compensation Effect

Confucian culture emphasizes the concepts of moderation and self-discipline, strengthening the self-restraint of corporate executives and thereby suppressing excessive executive compensation. Prior studies (Xu Xinyu et al., 2024) have noted that, based on risk-return compensation for executives, excess executive compensation is positively correlated with corporate risk-taking. Therefore, this study selects excess executive compensation as a corporate indicator to analyze its mediating role in corporate risk-taking. The excess executive compensation indicator constructed in this study follows the methods of Core et al. (1999; 2008), Wu Liansheng et al. (2010), and Xu Yude (2018). The calculation is based on the following formula, where the residual term e represents the

excess executive compensation:

$$Pay = \alpha_0 + \alpha_1 size_t + \alpha_2 lev_t + \alpha_3 ROA_t + \alpha_4 ROA_{t-1} + \alpha_5 IA_t + \alpha_6 growth_t + \alpha_7 gov_t + \sum_j Year + \sum_k Industry + e \quad (3)$$

From the regression results in Panel A, there is a significant negative relationship between the influence of Confucian culture and executive excess compensation. Specifically, *Conf_100* (representing the number of Confucian temples within a 100 km radius of the firm's registered location) has a coefficient of -0.0155 on excess executive compensation, which is significant at the 1% level (standard error: 0.00453). This result indicates that in regions with a strong presence of Confucian culture, the level of excess executive compensation is relatively lower. This phenomenon may be attributed to the Confucian advocacy of moderation, humility, and collectivism, cultural traits that may impose relative constraints on executive compensation. Similarly, *Conf_200* and *Conf_300* also exhibit significant negative impacts on excess executive compensation at the 1% and 5% significance levels, respectively, further confirming the restraining effect of Confucian culture on executive pay.

Further mechanism testing shows that when excess executive compensation is introduced as a mediating variable, the direct effect of Confucian culture on corporate risk-taking weakens. In Panel B, the relationship between Confucian culture, excess executive compensation, and corporate risk-taking is further examined. The regression results indicate that increases in excess executive compensation lead to higher corporate risk-taking. For example, in columns (2), (4), and (6), each unit increase in excess executive compensation leads to an increase in corporate risk-taking by 0.00335, 0.00312, and 0.00291, respectively, with these results being significant at the 5% and 10% levels. This suggests that when executives receive higher excess compensation, they may, due to incentive motivations, engage the firm in riskier decisions and take on greater operational risks.

Confucian culture plays a moderating role in the relationship between excess executive compensation and corporate risk-taking. While the negative effect of Confucian culture on executive compensation has been demonstrated in Panel A, when excess executive compensation is incorporated into the analysis, the impact of Confucian culture on corporate risk-taking weakens significantly. For example, the effect of *Conf_100* on corporate risk-taking becomes insignificant in column (2), and in columns (4) and (6), the coefficients of *Conf_200* and *Conf_300* also decrease, with their significance levels declining. This indicates that executive compensation, as a mediating variable, may play an important role in the process through which Confucian culture influences corporate risk-taking.

Table 9: Executive Excess Compensation(EEC) Effect

	(1) overpay	(2) Risk1	(3) overpay	(4) Risk1	(5) overpay	(6) Risk1
Panel A. Confucian influence on EEC						
Conf_100	-0.0155***					
	(0.00453)					
Conf_200			-0.00671***			
			(0.00215)			
Conf_300					-0.00500***	
					(0.00121)	
Panel B. Confucian and EEC influence on EAR						
overpay		0.00335**		0.00312**		0.00291*
		(0.00154)		(0.00156)		(0.00155)
Conf_100		-0.000147				
		(0.000395)				
Conf_200				-0.000224		
				(0.000167)		
Conf_300						-0.000182*
						(0.0000951)
Enterprise controls	Yes	Yes	Yes	Yes	Yes	Yes
City controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6626	6626	6626	6626	6626	6626

Standard errors in parentheses, * p < 0.1, ** p < 0.05, *** p < 0.01, EAR= enterprise assumption of risk

8 Heterogeneity analysis

8.1 Property rights of enterprise

This study conducts a heterogeneity test based on the property rights of enterprises (state-owned enterprises vs. non-state-owned enterprises) to examine how Confucian culture influences enterprise behavior, specifically analyzing how enterprises with different

ownership structures respond to the influence of Confucian culture. From the perspective of ownership, state-owned and non-state-owned enterprises exhibit different characteristics under the influence of Confucian culture.

Confucian culture emphasizes hierarchy, respect, and social responsibility, with deep historical roots and an important role in social governance in ancient China. The Han Emperor Wu's policy of "abolishing all schools of thought and respecting only Confucianism" made Confucianism a tool for rulers to maintain social order, exerting a profound influence on society, including corporate culture. As socialist state-owned enterprises, which are directly controlled and managed by the government, they are less affected by traditional cultural influences. In contrast, non-state-owned enterprises are more susceptible to the personal factors of executives and are generally more deeply influenced by Confucian culture.

The empirical results indicate clear heterogeneity in the influence of Confucian culture. For state-owned enterprises, the effect of Confucian culture on Enterprise Assumption of Risk is weak and statistically insignificant across all model specifications. In contrast, for non-state-owned enterprises, Confucian culture shows a significant and negative relationship with Enterprise Assumption of Risk across all distance measures (100 km, 200 km, and 300 km). This pattern suggests that the constraining effect of Confucian culture on enterprise risk-taking behavior mainly exists among non-state-owned enterprises.

Overall, these results imply that the institutional and policy constraints of state-owned enterprises reduce their sensitivity to cultural influences, while non-state-owned enterprises—owing to more flexible governance structures—are more responsive to Confucian cultural norms. Therefore, Confucian culture exerts a more substantial suppressive effect on Enterprise Assumption of Risk in non-state-owned enterprises.

Table 10: Heterogeneity on property rights of enterprises

	state-owned			non state-owned		
	(1)Risk1	**(2)Risk1**	**(3)Risk1**	**(1)Risk1**	**(2)Risk1**	**(3)Risk1**
Conf_100	0.000373			-0.00100***		
	(0.000281)			(0.000378)		
Conf_200		0.000000439			-0.000334**	
		(0.000131)			(0.000154)	
Conf_300			-0.0000408			-0.000183**
			(0.0000655)			(0.0000903)
age	-0.00241***	-0.00240***	-0.00240***	-0.00524***	-0.00521***	-0.00520***
	(0.000237)	(0.000240)	(0.000238)	(0.000339)	(0.000349)	(0.000347)
size	-0.00772***	-0.00766***	-0.00765***	-0.0248***	-0.0248***	-0.0247***
	(0.000960)	(0.000967)	(0.000961)	(0.00146)	(0.00149)	(0.00149)
TobinQ	0.00864***	0.00864***	0.00863***	0.0104***	0.0103***	0.0103***
	(0.00129)	(0.00129)	(0.00129)	(0.00106)	(0.00106)	(0.00106)
cflow	-0.0283*	-0.0288*	-0.0287*	-0.0898***	-0.0898***	-0.0900***
	(0.0169)	(0.0168)	(0.0167)	(0.0163)	(0.0162)	(0.0162)
Turnover	-0.00239	-0.00228	-0.00224	0.000685	0.000719	0.000711
	(0.00200)	(0.00201)	(0.00200)	(0.00260)	(0.00261)	(0.00260)
Assetratio	0.0391***	0.0387***	0.0388***	0.0574***	0.0578***	0.0579***
	(0.00922)	(0.00927)	(0.00930)	(0.00872)	(0.00885)	(0.00888)
Largesthoder	0.0000399	0.0000453	0.0000475	0.000684***	0.000689***	0.000688***
	(0.0000776)	(0.0000775)	(0.0000772)	(0.0000874)	(0.0000885)	(0.0000886)
HHI_A	0.0407***	0.0411***	0.0411***	-0.0215	-0.0215	-0.0215
	(0.0134)	(0.0134)	(0.0134)	(0.0138)	(0.0138)	(0.0138)
City controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14038	14038	14038	23719	23719	23719

Standard errors in parentheses, * p < 0.1, ** p < 0.05, *** p < 0.01

8.2 Enterprise size

Differences in firm size may lead to varying responses in compensation management, performance pressures, and cultural adaptation. Small and large firms differ significantly in organizational structures, management hierarchies, and market environments, and thus

may exhibit different characteristics under the influence of Confucian culture. Small firms often have flatter management structures and are subject to less external supervision and policy constraints, making them more susceptible to the influence of social and cultural factors. In contrast, large firms typically face more hierarchical management structures and policy constraints.

The table results indicate that, for small firms, the regression coefficient of the number of Confucian temples within 100 kilometers is -0.000782 and is significant at the 1% level, indicating a negative impact of Confucian culture on corporate risk-taking. In other words, the stronger the Confucian cultural influence, the smaller the pay gap. Similarly, the number of Confucian temples within 200 and 300 kilometers also shows a similar negative relationship and is significant at certain levels, demonstrating that Confucian culture has a significant restraining effect on risk-taking in small firms. For large firms, although the number of Confucian temples around the firm is also negatively related to corporate risk-taking, the effect is weaker compared to small firms and does not reach statistical significance.

The empirical results show that the impact of Confucian culture on corporate risk-taking exhibits significant heterogeneity under different ownership structures. Firm size plays an important role in explaining the differences in corporate risk-taking levels. Small firms are more easily influenced by Confucian culture, with a significant restraining effect on corporate risk-taking, while in large firms, due to marketing development and management mechanisms, the influence of Confucian culture is weaker, and its restraining effect on enterprise assumption of risk is not significant.

Table 11: Heterogeneity on enterprise size

	small			large		
	(1)Risk1	**(2)Risk1**	**(3)Risk1**	**(1)Risk1**	**(2)Risk1**	**(3)Risk1**
Conf_100	-0.000782**			-0.000362		
	(0.000333)			(0.000375)		
Conf_200		-0.00034***			-0.000187	
		(0.000124)			(0.000133)	
Conf_300			-0.00027***			-0.000101
			(0.0000828)			(0.0000740)
age	-0.00842***	-0.00840***	-0.00842***	-0.00182***	-0.00182***	-0.00182***
	(0.000422)	(0.000423)	(0.000418)	(0.000157)	(0.000159)	(0.000159)
size	-0.0478***	-0.0479***	-0.0478***	-0.00487***	-0.00494***	-0.00491***
	(0.00299)	(0.00302)	(0.00302)	(0.00118)	(0.00123)	(0.00121)
TobinQ	0.00896***	0.00894***	0.00894***	0.00604***	0.00602***	0.00601***
	(0.000976)	(0.000979)	(0.000979)	(0.00127)	(0.00127)	(0.00127)
cflow	-0.107***	-0.107***	-0.107***	-0.0557***	-0.0555***	-0.0554***
	(0.0174)	(0.0174)	(0.0174)	(0.0130)	(0.0130)	(0.0130)
Turnover	0.000386	0.000471	0.000502	-0.00248	-0.00248	-0.00247
	(0.00254)	(0.00254)	(0.00254)	(0.00183)	(0.00184)	(0.00183)
Assetratio	0.0677***	0.0681***	0.0684***	0.0285***	0.0286***	0.0288***
	(0.00709)	(0.00712)	(0.00712)	(0.00746)	(0.00752)	(0.00754)
Largesthoder	0.000150	0.000151	0.000151	0.000153*	0.000153*	0.000151*
	(0.000100)	(0.000101)	(0.000101)	(0.0000872)	(0.0000867)	(0.0000866)
HHI_A	-0.00866	-0.00870	-0.00875	-0.000161	-0.000104	-0.0000715
	(0.0157)	(0.0157)	(0.0157)	(0.0125)	(0.0124)	(0.0125)
City controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	20175	20175	20175	20215	20215	20215

Standard errors in parentheses, * p < 0.1, ** p < 0.05, *** p < 0.01

8.3 Enterprise R&D

Technological research and development (R&D) constitute a crucial component of modern firms' competitiveness. With technological progress and the acceleration of inno-

vation, firms' competitiveness in the market increasingly depends on their R&D capabilities. Particularly in high-tech industries, R&D not only drives the renewal of products and services but also enhances firms' market adaptability and profitability. Different levels of R&D may impact firms in various ways, including their risk-taking behavior (H. Zhang, 2022). This study uses the number of R&D personnel as an indicator of firms' R&D capacity, where a higher number of R&D personnel indicates stronger willingness and capability in R&D.

The table presents the regression results on corporate risk-taking under different levels of R&D personnel. Based on the level of R&D capacity, the sample is divided into groups with a low and high number of R&D personnel. For firms with fewer R&D personnel, the impact of R&D activities on risk-taking is relatively weak. In Model (1), the coefficient of Conf_100 is not significant, indicating that in firms with lower R&D investment, R&D activities have a limited impact on corporate risk-taking. Similarly, in Models (2) and (3), Conf_200 and Conf_300 do not exhibit significant effects, further confirming that R&D activities have a limited influence on the risk-taking of firms with fewer R&D personnel.

In contrast, for firms with a higher number of R&D personnel, the impact of R&D activities is more pronounced. For instance, in Model (4), Conf_100 has a negative effect on corporate risk-taking, with a coefficient of -0.00120, which is significant at the 10% level. This indicates that firms with high R&D investment are more inclined to take on lower levels of risk. In Models (5) and (6), Conf_200 and Conf_300 also show negative effects, significant at the 1% level, further demonstrating that firms with higher R&D investment exhibit lower levels of risk-taking.

The results of the heterogeneity tests indicate clear differences in the relationship between firms' R&D activities and their risk-taking behavior depending on the number of R&D personnel. For firms with a low number of R&D personnel, the impact of Confucian culture on corporate risk-taking is relatively weak, which may be due to insufficient R&D investment and a lack of technological innovation and competitive advantage, resulting in limited influence of Confucian culture on their risk-related decisions. In contrast, for firms with a high number of R&D personnel, Confucian culture exhibits a significant negative relationship with corporate risk-taking, indicating that firms under stronger Confucian cultural influence tend to adopt more conservative strategies.

Table 12: Heterogeneity on enterprise R&D

	fewer R&D employees			higher R&D employees		
	(1)Risk1	**(2)Risk1**	**(3)Risk1**	**(4)Risk1**	**(5)Risk1**	**(6)Risk1**
Conf_100	0.000336			-0.00120*		
	(0.000443)			(0.000663)		
Conf_200		0.0000976			-0.00055***	
		(0.000165)			(0.000186)	
Conf_300			0.0000418			-0.00038***
			(0.0000972)			(0.000118)
age	-0.0032***	-0.0032***	-0.0032***	-0.0035***	-0.0035***	-0.0035***
	(0.000293)	(0.000296)	(0.000296)	(0.000318)	(0.000320)	(0.000316)
size	-0.0219***	-0.0219***	-0.0219***	-0.0239***	-0.0239***	-0.0238***
	(0.00165)	(0.00165)	(0.00165)	(0.00204)	(0.00209)	(0.00209)
TobinQ	0.0107***	0.0107***	0.0107***	0.00435***	0.00431***	0.00429***
	(0.00162)	(0.00162)	(0.00162)	(0.00123)	(0.00123)	(0.00123)
Cflow	-0.0255	-0.0257	-0.0257	-0.0860**	-0.0849**	-0.0856**
	(0.0231)	(0.0231)	(0.0231)	(0.0357)	(0.0357)	(0.0357)
Turnover	0.00218	0.00219	0.00221	-0.000441	-0.000391	-0.000338
	(0.00347)	(0.00347)	(0.00347)	(0.00628)	(0.00635)	(0.00638)
Assetratio	0.0542***	0.0542***	0.0541***	0.0346**	0.0355**	0.0358**
	(0.0113)	(0.0113)	(0.0113)	(0.0166)	(0.0172)	(0.0171)
Largesthoder	0.000419***	0.000419***	0.000419***	0.000310*	0.000320**	0.000318**
	(0.000124)	(0.000124)	(0.000124)	(0.000158)	(0.000157)	(0.000157)
HHI_A	0.0591*	0.0589*	0.0588*	0.0179	0.0178	0.0176
	(0.0336)	(0.0337)	(0.0337)	(0.0316)	(0.0315)	(0.0315)
City controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	9728	9728	9728	9722	9722	9722

Standard errors in parentheses, * p < 0.1, ** p < 0.05, *** p < 0.01

9 Reflection and Limitations

Although this study uses the number of Confucian temples and inscriptions as proxies for the intensity of Confucian culture, we acknowledge that these indicators may reflect the historical rather than the contemporary cultural atmosphere. The availability of long-term and spatially consistent cultural data led us to adopt these relatively stable, objective measures. Nevertheless, we recognize that such architectural indicators may

not fully capture the dynamic and evolving influence of Confucian culture in modern contexts.

Future research could complement this approach by incorporating contemporary cultural indices—such as survey-based measures, participation in local education or cultural programs, or data on cultural organizations—to triangulate and enrich the understanding of Confucian cultural influence. We also think measurements of ROA can be more diverse, future research is encouraged to use different calculation methods to verify the conclusion's robustness. Despite these limitations, the current indicators still provide meaningful insights into the persistent imprint of Confucian culture on regional social norms and corporate behavior, and we have made every effort to ensure the robustness and validity of the empirical results.

10 Conclusion

Confucian culture, with its long and profound history, has always served as an important cornerstone in shaping and developing Chinese societal values. The level of enterprise assumption of risk not only reflects the pursuit of better performance and benefits but also serves as an important indicator of the level of risk a firm can bear. Chinese enterprises are, to a large extent, influenced by Confucian culture, embodying values with distinct Chinese characteristics such as "benevolence, righteousness, and trustworthiness."

This study utilizes data from A-share non-financial listed companies in China from 2000 to 2023, along with data on the number of Confucian temples within 100km, 200km, and 300km of the firms' registered locations. Drawing on previous research, the number of Confucian temples is used as a proxy variable to measure the strength of Confucian cultural influence, examining its relationship with corporate risk-taking. Corporate risk-taking is quantified using a three-year rolling return volatility measure. Through fixed effects regression analysis, this paper finds a significant negative relationship between Confucian culture and corporate risk-taking, indicating that firms located in regions with stronger Confucian cultural influence tend to avoid excessive risk-taking. To ensure the robustness of the empirical results, this study further employs an instrumental variable approach using the "Mancheng" method to effectively mitigate endogeneity concerns.

This paper further explores the mechanisms through which Confucian culture influences corporate risk-taking from two perspectives: the effect of corporate ESG performance and the effect of executive excess compensation. The findings indicate that ESG scores and executive compensation play significant mediating roles in the relationship between Confucian culture and corporate risk-taking. In the heterogeneity analysis, this paper conducts in-depth examinations based on ownership structure, firm size, and innovation capacity. The results show that non-state-owned enterprises are more susceptible to the influence of Confucian culture compared to state-owned and government-controlled enterprises; small-scale enterprises are more affected by Confucian culture than large-scale

enterprises; and in terms of innovation, firms with a higher number of R&D personnel exhibit a more significant negative relationship between Confucian culture and corporate risk-taking.

This study provides an in-depth analysis of the factors influencing corporate risk-taking and cultural factors, offering important guidance for corporate strategic development and risk strategy formulation. Additionally, this research contributes to a deeper and more comprehensive understanding of the critical role of cultural factors, such as Confucian culture, in risk decision-making. However, this study also has certain limitations. First, the research subjects are limited to A-share listed companies, and the applicability of the findings to other countries or regions remains uncertain. Second, the reasons behind the construction of Mancheng may be diverse and require further clarification.

As a non-institutional factor influencing corporate development, culture plays an important role in shaping corporate strategic choices and organizational development. Confucian culture, as a traditional culture with Chinese characteristics, continues to hold significant guiding value today. Research combining Confucian culture with corporate risk-taking not only helps to reveal the mechanisms through which culture operates within enterprises but also provides new evidence to support corporate decision-making. At the same time, it offers strong empirical support for the inheritance and development of Confucian culture and its integration with corporate strategy.

11 Statements and Declarations

11.1 Competing Interests:

The authors declare that they have no competing interests, either financial or non-financial, that are directly or indirectly related to the work submitted for publication.

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