

Applied Economics

ISSN: 0003-6846 (Print) 1466-4283 (Online) Journal homepage: www.tandfonline.com/journals/raec20

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To cite this article: Sha Wu & Mengfei Wan (2024) Does Confucian culture reduce corporate default risk? Evidence from China, Applied Economics, 56:34, 4114-4127, DOI: 10.1080/00036846.2023.2210817

To link to this article: https://doi.org/10.1080/00036846.2023.2210817

Published online: 07 May 2023.

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APPLIED ECONOMICS
2024, VOL. 56, NO. 34, 4114–4127
https://doi.org/10.1080/00036846.2023.2210817

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Does Confucian culture reduce corporate default risk? Evidence from China

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ABSTRACT

Confucianism is the cornerstone of traditional Chinese culture, and it has a significant impact on corporate behaviour. This paper investigates the relationship between Confucian culture and default risk. Using a sample of Chinese listed companies that covers the period between 2010 and 2020, we find robust evidence that Confucian culture is negatively associated with the probability of default. The effect operates through improvements in reputation and resource acquisition. It is more pronounced at firms that face severe financing constraints, at firms that are located in regions with high marketization, and at firms that are subject to weaker external supervision. Additional analyses show that Confucian culture improves corporate social responsibility and the quality of internal control, reduces earnings management and corporate risk-taking, and, ultimately, decreases the overall value of the firm. On the whole, our findings provide evidence of the role of cultural factors in filling institutional voids.

KEYWORDS

Confucian culture; default risk; informal system; reputation; resource acquisition

JEL CLASSIFICATION

G30; G32; H32

I. Introduction

Default risk is the probability that a borrower will fail to make a payment within a specified period. As an important part of credit risk, default risk has always been a widely debated issue in the fields of economics and finance (Hsu et al. 2015). Bond financing, as an indispensable financing channel, has become an essential source of support for the strong growth of Chinese firms (Allen, Qian, and QIAN 2005). In recent years, the Chinese bond market has developed rapidly, reaching $9.623 billion in size and becoming the second-largest bond market in the world. However, the number of bond defaults has increased over that period. By the end of 2020, there were 582 bonds in default in the Chinese market, with a default amount of RMB 525.138 billion. Defaults cause significant harm to creditors. In addition, bond defaults are contagious, and large-scale default may trigger systemic financial risks. In the light of these severe consequences, it is imperative to explore the determinants of default risk.

Scholars have examined various such determinants, including ownership structure (Chiang, Chung, and Huang 2015), stock liquidity (Brogaard, Li, and Xia 2017), corporate innovation (Hsu et al. 2015), and corporate social responsibility (Sun and Cui 2014). A few recent studies have examined the role of informal institutions, such as culture, in default risk. Culture is a set of shared beliefs and values that is transmitted across generations in a nation, and it is a social norm that is shared by a specific group of individuals. Imprinting theory holds that culture is an important factor that affects corporate behaviour (El Ghoul et al. 2019). In recent years, transdisciplinary research on culture and finance has attracted considerable public attention around the globe. As the largest emerging economy in the world, China has an institutional system that still exhibits certain deficits (Wu and Jiao 2022). In the Chinese capital market, culture may play a more important role than in developed countries.

Confucian culture, as a system of social and ethical philosophy, serves as a set of moral norms and as a guide for action in China (Chen, Xiao, and Zhao 2021). In particular, Confucian businessmen take Confucian culture as their core guiding philosophy in business. Financial contracts are essentially based on trust.

Confucian culture has relationship-oriented characteristics (Li, Xu, and Long 2020). It helps

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enterprises to create harmonious relationships and to obtain resources from financial institutions and the government. Honesty and trustworthiness have always been treated as basic moral norms in Confucian culture. Firms in regions with a stronger Confucian culture are more disciplined and have superior reputations. Thus, the likelihood of default of firms is reduced. Specifically, we speculate that Confucian culture has a significant negative impact on corporate default risk. Therefore, this study aims to examine the effect of Confucian culture on corporate default risk.

We used the geographic distance between a firm and a Confucian cultural centre to test our hypotheses. To that end, we use a Google Earth digital map and an equation from a geographic information system (GIS), which provides us with an alternative proxy for Confucian culture. Using data from Chinese listed companies between 2010 and 2020, we find that Confucian culture reduces corporate default risk by improving reputation and resource acquisition.

As a robustness check, we examine the distribution of Confucian temples and Confucian academies in a given province, treating them as a substitute proxy of Confucian culture. To alleviate the endogeneity issues of the model, we also employ an instrumental variables approach and use controls for industry time trends. We also employ other robustness tests: change the estimation method, adjust the research sample, and redefine the independent variable indicator. These results confirm the robustness of the four main findings.

In our cross-sectional analyses, we find that the negative effect of Confucian culture on corporate default risk is more pronounced at firms that face severe financing constraints, at firms in regions with high marketization, and at firms that are subject to weaker external regulation. In the additional analyses, we find that Confucian culture improves corporate social responsibility and internal control quality, reduces earnings management and corporate risk-taking, and, ultimately, decreases the overall value of the firm.

This study contributes to the literature in three ways. First, it extends the literature that explores the economic consequences of Confucian culture. To the best of our knowledge, this study is the first empirical investigation of the influence of Confucian culture on corporate default risk, a crucial issue of corporate governance and business ethics. Confucian culture is the most vital culture in China, and its influence is extensive. The existing literature on Confucian culture, which reflects the adoption of normative research methods, mainly focuses on the fields of philosophy and sociology. A few scholars have subjected the impact of Confucian culture on corporate issues, such as cash holdings (Chen et al. 2020), overinvestment (Chen, Ye, and Jebran 2019), tax avoidance (Chen, Xiao, and Zhao 2021), and the risk of stock price crashes (Jebran et al. 2019), to empirical investigation. This paper fills the gap in the literature by examining the role of Confucian culture from a default-risk perspective. It draws on empirical evidence from an emerging market.

Second, the study enriches and supplements research on the factors that influence corporate default risk by adopting an informal-institutions perspective. The literature mostly focuses on institutional factors and corporate characteristics to investigate the determinants of default risk (Bharath and Tyler 2008; Hsu et al. 2015). Fewer studies have explored corporate default from the perspective of Confucian culture. By examining the context of China, the cradle of Confucian culture, this study can deepen the academic understanding of the determinants of corporate default risk and thus uncovers the positive aspects of Confucian culture.

Third, this paper expands the scope of research on the association between culture and corporate behaviour. The emerging literature on the influence of culture on corporate behaviour has attracted the attention of a growing number of scholars. Regretfully, that literature mainly focuses on Western cultural symbols, such as religion (Cai, Li, and Tang 2020). Using a large panel of Chinese listed companies, the study examines the role of Confucian culture in reducing default probability, a specific ethical corporate behaviour. We show that Confucian culture, rather than religiosity, is the cultural factor that affects default risk in China. Our findings provide insights into the manner in which traditional culture shapes the decision making of firms in emerging markets.

II. Institutional background

After the birth of Confucian culture at the end of the Spring and Autumn period, Confucianism gradually became the dominant basic norm of the feudal rulers that followed the Han Dynasty. It had a profound influence on Chinese culture, politics, and economics in the following millennia. More than 2,500 years of development saw the gradual formation of seven Confucian cultural centres and 52 national Confucius temples. The seven Confucian centres in China are Lu (Qufu, Shandong Province), Luo (Luoyang, Henan Province), Shu (Chengdu, Sichuan Province), Min (Sanming and Longyan, Fujian Province), Taizhou (Dongtai, Jiangsu Province), Zhedong (the eastern region of Zhejiang Province), and Linchuan (Linchuan, Jiangxi Province). In ancient China, Confucius temples were built to commemorate Confucius and to spread Confucian culture.

Confucian culture is the complete ideological system that Confucius created. It advocates five virtues, namely benevolence, righteousness, propriety, wisdom, and fidelity. Confucian culture permeates the value systems of entrepreneurs in China, and it is reflected and embodied in business decisions. The term 'Confucian business' refers to the blend of commercial practice and Confucian ideology, and it regulates business behaviour by reference to Confucian ethics. In the development of the contemporary market economy, the influence of Confucian culture on the management of listed companies can also be regarded as a contemporary form of Confucian business.

Confucian culture has been criticized for being backward looking and faces challenges in modern society. However, as the spiritual lifeline of the Chinese nation, its central role in the formation and development of traditional Chinese culture has made it irreplaceable, and it has always occupied a dominant position. The Party and the government have also called for the revival of Confucian culture and for the establishment of a social value system that has traditional values at its core, thus enhancing the cultural self-confidence of the nation. Contemporary actors constantly inject new elements into Confucian culture by improving its concepts, content, and form, which makes Confucian culture glow with vitality. As the most influential cultural belief in China, Confucian culture not only has an important influence on individual ideology but also plays a critical role in enterprise management (Chen, Xiao, and Zhao 2021).

In recent years, the rapid emergence of cultural studies on financial economics has seen extensive attention directed to the economic consequences of Confucian culture (Chen, Ye, and Jebran 2019; Jebran et al. 2019). In empirical studies, scholars usually use the geographical proximity between the addresses of companies and Confucian centres (Du 2016) or the density of the distribution of Confucian temples (Du 2015) as proxy variables that enable the influence of Confucian culture to be measured. Numerous literatures have shown that Confucian culture, as an important complement to formal institutions, has a significant impact on macroeconomic and micro-enterprise behaviour. At the macro level, Confucian culture, being an important spiritual element of the socialist market economy of China, has a significant impact on economic growth (Pezzutto 2019). At the micro level, Confucian culture influences corporate behaviours, such as workforce structure (Chen, Xiao, and Zhao 2021; Du 2016), investment decisions (Chen, Ye, and Jebran 2019; Chen et al. 2020), and the risk of stock price crashes (Jebran et al. 2019).

III. Development of hypotheses

Imprinting theory suggests that environmental characteristics that obtain at particular points in time have a significant impact on individuals and organizations. Environmental characteristics are imprinted, and the imprints influence individual and organizational behaviour continuously; they do not disappear easily (Marquis and Tilcsik 2013). Sociological research has suggested that the cultural concepts of a society are also imprinted and exert subtle influences on the values of individuals, which are reflected in economic behaviour. Confucian culture, as a social norm that has been passed down for thousands

of years, is bound to become a cultural imprint that influences corporate behaviour and thus affects entrepreneurial decisions (El Ghoul et al. 2019). This cultural imprint is reflected in the contractual compliance behaviours of entrepreneurs.

Confucian culture influences the values of individuals. In Confucian culture, individuals implicitly accept values and try to fit into an informal system of discipline. Confucian culture emphasizes righteousness, propriety, and fidelity. It urges the members of society to attach considerable importance to personal reputation and self-discipline. The concepts of righteousness and fidelity in Confucian culture are implicitly incorporated into the modern business ethics system. Confucian businessmen treat reputation as being of particularly high import. This proposition is especially relevant to the most senior executives in China (Allen, Qian, and QIAN 2005). Default may expose firms to penalties and reputational damage. Consequently, entrepreneurs try to avoid unethical behaviour in order to avoid reputational harm in the social networks that they inhabit. Thus, in China, reputation plays a more important role in combatting corporate default than the law (Siegel 2005).

Confucian culture also constrains individual behaviour. The basic ethical norms of Confucian culture are honesty and trustworthiness (Du 2015). Confucian culture emphasizes the desirability of obtaining legitimate benefits through hard work and by legal means. The central belief is that integrity can generate long-term business value. Confucian culture has also been proven to alleviate manager-shareholder conflicts (Chen et al. 2020), to reduce overinvestment (Chen, Ye, and Jebran 2019), and to diminish the incidence of tax avoidance (Chen, Xiao, and Zhao 2021). Bond default seriously damages the interests of investors and has significant adverse consequences for the development of firms. Confucian businessmen who regard integrity as a fundamental business principle strive to be more self-disciplined and reliable (Chen et al. 2020), which can help reduce the incidence of unethical behaviours such as default (Jebran et al. 2019).

In addition, Confucian culture improves interpersonal relationships. China has traditionally been a relational society in which social capital is embedded in a network of relationships. Confucian culture exhibits typical relationship-oriented characteristics. Based on the values of benevolence and harmony, Confucian culture calls for individuals to maintain positive and cordial relationships with others. These positive interpersonal relationships enable exchanges of trade credit and result in the formation of a type of social capital that enables enterprises to obtain resources under favourable conditions (Li, Xu, and Long 2020). Influenced by Confucian culture, enterprises maintain positive relationships with external stakeholders, thus expanding their access to financing channels. This tendency reduces the difficulty of obtaining resources from external sources and the attendant costs. At the same time, the high degree of trust and the considerable importance that is attached to reputation in Confucian culture also help firms to access resources and to obtain credit support at lower costs (Li, Xu, and Long 2020). The provision of adequate resources guarantees the normal operation of the enterprise while reducing the risk of default.

H_1: Confucian culture reduces corporate default risk.

H_2: Reputation is a potential channel through which Confucian culture influences corporate default risk.

H_3: Resource acquisition is a potential channel through which Confucian culture influences corporate default risk.

IV. Research designs

Sample selection

Our sample covers Chinese A-share listed firms from the Shanghai and Shenzhen Stock Exchanges and the period between 2010 and 2020. We merge this data with data on Confucian culture. We measured Confucian culture by using the geographic distance between a firm and its nearest Confucian culture centre.

The longitudes and latitudes of firms and Confucian culture centres were collected manually. We cleaned the sample as follows: (1) we excluded firms from the financial industry, (2) we excluded firms that were ST, and (3) we excluded observations with missing data. Finally, 22658 observations of 4,190 listed firms were obtained. The data were mainly obtained from the CSMAR databases.

Main variables

Default risk

We use the Nave model that was proposed by Bharath and Tyler (2008) to estimate the probability of default (*EDF*). We take the following steps to calculate default risk:

$$DD_{it} = \frac{log\left(\frac{Equity_{it}+Debt_{it}}{Debt_{it}}\right) + \left(r_{it-1} - \frac{\sigma_{v_{it}}^2}{2}\right) \times T_{it}}{\sigma_{v_{it}} \times \sqrt{T_{it}}}, \tag{1}$$

whereDD_{it} denotes default risk distance; $Equity_{it}$ denotes the total market capitalization of a firm, which is the product of the total number of stock issues and the year-end market price; $Debt_{it}$ is the face value of the debt of the firm, which is the sum of half of the firm's year-end short-term liabilities and its year-end long-term liabilities; r_{it-1} is the one-year lagged annual rate of return of the firm, which is calculated by reference to its monthly stock return for the previous year; T_{it} is set to 1 year in the formula; and $\sigma_{v_{it}}$ is the estimated asset volatility of the firm, which is obtained by calculating $\sigma_{E_{it}}$. $\sigma_{E_{it}}$ is the volatility of stock returns, which is obtained from the standard deviation of the monthly return data of the company for the previous year. $\sigma_{E_{it}}$ is calculated as follows:

$$\sigma_{v_{it}} = \frac{Equity_{it}}{Equity_{it} + Debt_{it}} \times \sigma_{E_{it}} + \frac{Debt_{it}}{Equity_{it} + Debt_{it}} \times (0.05 + 0.25 \times \sigma_{E_{it}}). \tag{2}$$

Equation (1) and Equation (2) enable the calculation of default risk distance (DD_{it}). Then, the standard cumulative normal distribution function Normal(.) can be used to find the default probability of the enterprise, as in Equation (3):

$$EDF_{it} = 100 * Normal(-DD_{it}). \tag{3}$$

The values of *EDF* are normally distributed and range between 0 and 1. The greater the value of *EDF*, the greater the default risk of the enterprise.

To ensure the robustness of the results, we also consider the ex post default probability of listed firms. The differences between short-term borrowings (including long-term borrowings that are due within one year) and current repayments (corresponding to 'cash paid for debt repayment' in the cash flow statement) is used to determine whether a company has repaid its debts on time. We set the dummy variable *Violate* to represent the probability of ex post default. When the difference is positive, the firm has not repaid a loan on time, and the variable *Violate* takes a value of 1; otherwise, it takes a value of 0. When *Violate* is employed as a dependent variable, we use the Logit model for regression analysis.

Confucian culture

Drawing on Du (2016) and Chen, Xiao, and Zhao (2021), we measure Confucian culture by using the average distances between the registered addresses of the listed companies and seven Confucian centres. We employed a well-known equation from a GIS to construct geographic proximity-based Confucian culture variables. The specific steps are described in the paragraphs that follow.

First, the latitudes and the longitudes of the registered addresses of the companies and the Confucian centres are collected from Google Maps. Second, the geographic distance (*DIS*) between a firm and each Confucian culture centre is calculated. The specific equation is as follows:

$$DIS = ABC \times \left(\frac{\pi}{2} - arctan\left(\frac{cos\beta}{1 - cos^2\beta}\right)\right), \tag{4}$$

where *ABC* represents the per radian length of the arc between a listed firm and a Confucian cultural centre. β is a central angle that is based on the coordinates of the registered address of the company and on the location of a Confucian cultural centre. Third, an average value (DIS_N) is calculated on the basis of *DIS*. Fourth, the Confucian cultural

variable (*Confu*) is calculated by substituting average geographic distance (DIS_N) into the following equation:

$$Confu = \left(\frac{Max_{DIS_N} - DIS_N}{Max_{DIS_N} - Min_{DIS_N}}\right), \quad (5)$$

where Max_DIS_N and Min_DIS_N represent the maximum and minimum value of DIS_N, respectively. The greater the value of *Confu*, the stronger the influence of Confucian culture.

Other controls

The control variables include firm size (*Size*), firm age (*Listing*), debt ratio (*Lev*), asset liquidity ratio (*Cfo*), return on assets (*ROA*), the sales growth of the firm (*Growth*), the shareholding ratio of the largest shareholder (*Top1*), and the proportion of independent directors (*Indep*). See Appendix A for further details.

Empirical research model

To test the effect of Confucian culture on default risk, we estimate the following model:

$$Violation_{it} = \beta_0 + \beta_1 Confu_{it} + \beta_2 Controls_{it} + Industry + Year + \varepsilon_{it}, \quad (6)$$

where the outcome variable ($Violation_{it}$) is the default risk of firm i in year t, which is captured by default probability (*EDF*) and ex post default (*Violate*). The independent variable ($Confu_{it}$) reflects the influence of Confucian culture, and $Controls_{it}$ is a set of control variables. ε_{it} denotes the residuals. We also control for industry fixed effects and year fixed effects. Since default probability (*EDF*) is a continuous variable and ex post default (*Violate*) is a dichotomous variable, the baseline regression is conducted with OLS and Logit models.

V. Descriptive analysis and empirical results

Descriptive statistics

Table 1 presents the descriptive statistics of the main variables. Default risk (*EDF*) ranges from 0 to 0.853, with a mean of 0.01 and a standard deviation of 0.089, indicating that the default probabilities of the firms in the sample vary widely. The mean value of *Violate* is 0.093. Therefore, firms that have defaulted account for 9.3% of the sample.

Regression results

Confucian culture and corporate default risk

Table 2 displays the baseline regression results. The regression results in column (1) and column (3) reflect the use of controls for year and industry fixed effects only. The results in column (2) and column (4) account for all of the control variables. The coefficients for *Confu* are all negative and significant at the 1% level, indicating that Confucian culture reduces default risk. The economic effect can be interpreted as follows: for every one-standard-deviation increase in the influence of Confucian culture, the default probability decreases by 0.018 standard deviations. If the influence of Confucian culture increases by 1%, the ex post default probability decreases by 47.28%.

Table 1. Descriptive statistics.

Variable	N	Mean	S. D.	Min	Median	Max
EDF	22,658	0.010	0.089	0	0	0.853
Violate	22,658	0.093	0.291	0	0	1
Confu	22,658	0.870	0.134	0.183	0.896	0.999
Size	22,658	15.708	0.953	14.027	15.577	18.604
Age	22,658	2.345	0.637	1.099	2.398	3.296
SOE	22,658	0.409	0.492	0	0	1
Liquidity	22,658	0.544	0.204	0.087	0.552	0.953
Tng	22,658	0.225	0.168	0.002	0.191	0.714
Cfo	22,658	0.043	0.068	−0.163	0.043	0.233
Lev	22,658	0.474	0.194	0.095	0.470	0.916
ROA	22,658	0.028	0.065	−0.317	0.031	0.175
Growth	22,658	0.177	0.447	−0.577	0.102	2.894
Turnover	22,658	0.621	0.440	0.072	0.519	2.586
Indep	22,658	0.375	0.054	0.333	0.357	0.571
Top1	22,658	0.340	0.148	0.085	0.318	0.746
Balance	22,658	0.896	0.776	0.041	0.680	3.855

Table 2. Main results.

Variable	(1) EDF	(2) EDF	(3) Violate	(4) Violate
Confu	−0.023***	−0.012***	−1.034***	−0.749***
	(−5.27)	(−2.74)	(−7.02)	(−4.90)
Size		0.000		−0.163***
		(0.21)		(−5.42)
Age		0.001		0.299***
		(0.88)		(6.23)
SOE		0.002		0.058
		(1.05)		(1.02)
Liquidity		0.002		−0.769***
		(0.55)		(−4.55)
Tng		0.026***		−0.936***
		(4.80)		(−4.53)
Cfo		−0.026***		0.975**
		(−2.62)		(2.46)
Lev		0.082***		0.422***
		(22.19)		(2.93)
ROA		−0.004		−2.201***
		(−0.34)		(−6.09)
Growth		−0.002*		−0.208***
		(−1.67)		(−2.91)
Turnover		−0.007***		−0.290***
		(−4.68)		(−4.06)
Indep		0.002		−0.442
		(0.22)		(−1.01)
Top1		0.013**		−0.139
		(2.08)		(−0.57)
Balance		0.002*		0.044
		(1.87)		(1.05)
Constant	0.014**	−0.050***	−1.678***	0.785
	(2.16)	(−3.62)	(−7.09)	(1.41)
Industry	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
R^2	0.022	0.053	0.020	0.042
Num	22658	22658	22658	22658

*, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. T-statistics are shown in parentheses.

Robustness test

Endogeneity test: instrumental variables approach

We used two-stage least squares to further mitigate the potential for endogeneity bias. We selected the number of chaste pagodas (*CMA*) in the region in which a company operates as an instrumental variable.

(1) Correlation of instrumental variables. Chastity pagodas are erected to show that women keep their virtue. In general terms, the number of chastity pagodas reflects recognition of and adherence to the Confucian moral concepts of 'The Three Obediences and Four Virtues' in a locality. Therefore, the higher the number of chastity pagodas in a region, the stronger the influence of the Confucian concept of virtue.

(2) Exogeneity of instrumental variables. As a purely exogenous variable, the number of chaste pagodas in the region in which a company operates is not influenced by corporate default, nor does it affect corporate default through alternative paths. Therefore, the theoretical requirement of instrumental variable homogeneity is satisfied.

Table 3 reports the results from the endogeneity analysis. As far as the 2SLS model is concerned, the first-stage results in column (1) of Table 3 show that the number of pagodas (*CMA*) and Confucian culture (*Confu*) are significantly and positively correlated. The weak instrumental variable test yields an *F*-statistic value of 412.26, which is much larger than 10, indicating that the instrumental variable is valid. The regression results in column (2) and column (3) show that

Table 3. Robustness test.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	instrumental variables			Control industry time trends		Substitute independent variable			
Variable	Confu	EDF	Violate	EDF	Violate	EDF	Violate	EDF	Violate
Confu		−0.040***	−0.288***	−0.012***	−0.737***	−0.086**	−0.062**	−0.002***	−0.095***
		(−3.77)	(−8.25)	(−2.80)	(−4.60)	(−2.36)	(−2.09)	(−3.57)	(−5.18)
CMA	0.004***								
	(70.47)								
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.203	0.051	0.017	0.061	0.055	0.022	0.030	0.052	0.044
Num	22658	22658	22658	22658	22400	22658	22658	22658	22658

Regression results for the control variables in the subsequent tables are not reported.

the regression coefficients of Confucian culture (*Confu*) are both significantly negative at the 1% level, which is consistent with the findings that were presented above. Evidently, the test results are indicative of relatively high robustness once the possible endogeneity problem is taken into account.

Endogeneity test: control for industry time trends

To mitigate the effects of omitted variables, we further control for industry time trends. The interaction term of industry and year is added to Model (6). The regression results are shown in column (4) and column (5) of Table 3. The negative relationship between Confucian culture and corporate default risk remains robust.

Sensitivity test of indicators of Confucian culture

Borrowing from Du (2015), we use the density of the distribution of Confucian temples as a proxy variable in order to measure the influence of Confucian culture. Specifically, we use the natural logarithm of the number of Confucian temples within a 200 km radius of the registered location of a company. The data were mainly obtained from Chinese Research Data Services (CNRDS). We acquired the addresses of Confucius temples from the Chinese Academy Dictionary, and we obtained the co-ordinates of the temples and the locations of the enterprises from Google Maps. Here, we calculate the geographical distances between those points. The more Confucius temples there are around an enterprise, the stronger the influence of Confucian culture. It is clear from the test results in column (6) and column (7) of Table 3 that the regression coefficients of the *Substitution* indicator of the Confucian culture variable are negative at the 5% level, indicating that the stronger the influence of Confucian culture, the lower the probability of enterprise default.

Kung and Ma (2014) used the number of Confucian temples in a region as a proxy for Confucian culture and tested the positive role of Confucian culture in alleviating social conflicts empirically. In order to ensure that the conclusions are reliable, we use the natural logarithm of the number of Confucian academies in the province in which a company is located as an alternative measurement of Confucian culture. The results in column (8) and column (9) in Table 3 show that the regression coefficients of *Confu* are significantly negative at the 1% level. This finding is consistent with previous empirical results. Evidently, informal systems such as Confucian culture are important factors that reduce corporate default risk.

Other robustness tests

We also perform several additional robustness checks. First, we change the estimation method. Taking into account the distribution characteristics of default risk (*EDF*), which takes values between 0 and 1, we use the Tobit regression model to conduct tests. Second, we adjust the sample. Since Beijing was the political centre of feudal rule in ancient China, its influence on Confucian culture may have been different than in other regions. Furthermore, Shanghai is the city with the strongest Western influence in modern China, and the impact of Confucian culture may also be different from that which is observed in other regions. Therefore, drawing on Du

(2015), we rerun the test on a sample from which companies that are registered in Beijing and Shanghai are excluded. Third, we redefine the independent variable indicator. We also use 100 km and 300 km radii as alternatives. The results of these robustness tests are consistent with the main conclusions of this paper. Due to space limitations, the regression results are not presented here.

Mechanism analysis

To verify the mechanism by which Confucian culture influences corporate default, we draw on Baron and Kenny (1986). Thus, we employ the mediating-effect test in Model (7) and Model (8) in conjunction with Model (6).

$$MV_{it} = \beta_0 + \beta_1 Confu_{it} + \beta_2 Controls_{it} + Industry + Year + \varepsilon_{it} \tag{7}$$

$$Violation_{it} = \beta_0 + \beta_1 Confu_{it} + \beta_2 MV_{it} + \beta_3 Controls_{it} + Industry + Year + \varepsilon_{it}, \tag{8}$$

where MV_{it} are mediating variables that capture reputation and resources acquisition. The control variables are the same as in Model (6).

Reputation

The first potential mechanism by which Confucian culture may reduce default risk is related to reputation. Reputation is an important asset for companies. Default damages the reputation of a company, and it is difficult to recover over time. Confucian culture advocates righteousness, propriety, and fidelity, and entrepreneurs have internalized these core values as basic norms of conduct (Siegel 2005). The inhabitants of areas that are strongly influenced by Confucian culture are more self-disciplined and attribute more importance to reputation (Allen, Qian, and QIAN 2005), which reduces the motivation for default.

To explore this mechanism, we employ the dummy variable *Big4* to examine reputation. If a firm has hired one of the Big Four consulting firms (KPMG, PwC, EY, and Deloitte), then *Big4* takes a value of 1; otherwise, it takes a value of 0. Table 4 presents the regression results. Column (1) presents the results with *Big4* as the dependent variable; the dependent variables in column (3) and column (4) are *EDF* and *Violate*, respectively. The coefficient estimates for *Confu* are negative and significant in all columns, indicating that firms in regions with a stronger Confucian cultural influence are more sensitive to the importance of reputation and more likely to engage in integrity management and to avoid default. In general, these results indicate that it is plausible that reputation is a mechanism through which Confucian culture reduces corporate default risk.

Access to resources

The second potential mechanism by which Confucian culture may reduce default risk is resource acquisition. This term refers to both

Table 4. Mechanism test.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Reputation Mechanisms			Financial resources			Government resources		
Variable	Big4	EDF	Violate	CRES	EDF	Violate	Subsidy	EDF	Violate
Confu	0.041***	−0.013***	−0.772***	0.084***	−0.014**	−0.536***	0.355***	−0.012**	−0.679***
	(4.05)	(−2.88)	(−5.04)	(3.49)	(−2.56)	(−3.12)	(3.93)	(−2.42)	(−4.35)
Big4		0.014***	0.585***						
		(5.46)	(6.08)						
CRES					−0.005***	−0.384***			
					(−4.72)	(−7.51)			
Subsidy								−0.001***	−0.042***
								(−3.88)	(−3.46)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.151	0.054	0.045	0.567	0.057	0.051	0.235	0.054	0.036
Num	22658	22658	22658	22658	22658	22658	22658	22658	22658
Sobel Z		3.417***	3.197***		−2.11**	−3.597***		−2.774**	−2.822***
Sobel P		(0.001)	(0.001)		(0.035)	(0.000)		(0.006)	(0.005)

financial resources and government resources. Confucian culture enables firms to optimize resource acquisition. That culture exhibits standard relationship-oriented characteristics. Positive interpersonal relationships are conducive to the formation of social capital, which means that firms that are influenced by Confucian culture can obtain more resources (Li, Xu, and Long 2020). Enterprises that are closely related to the government have a higher likelihood of obtaining financial subsidies (Ferris, Houston, and Javakhadze 2016). Adequate financial resources and government support reduce the probability of default.

Following Cosci, Meliciani, and Sabato (2016), we use the natural logarithm of the sum of short-term borrowings, long-term borrowings, and accounts payable divided by total assets as a proxy for the acquisition of financial resources. We employ the natural logarithm of government subsidies divided by total assets to examine the acquisition of government resources. The higher the values in question, the greater the ability of the company to obtain resources.

The results are shown in columns (4)-(9) in Table 4. In column (4) and column (7), *Confu* is positive and significant at the 1% level, suggesting that Confucian culture benefits the efforts of enterprises to obtain resources. In the remaining columns, *Confu* remains significantly negative. These results indicate that resource acquisition is another potential mechanism through which Confucian culture may reduce corporate default risk.

Furthermore, we conduct a Sobel test to determine whether the mediation effect is established. The results show that the *Z* and *P* values are significant, at least at the 5% level. Evidently, reputation and resources acquisition have intermediary effects in the process by which Confucian culture alleviates corporate default risk.

Cross-sectional analysis

Financing constraint

This paper argues that Confucian culture helps companies to gain prestige and to enhance their social reputations, which makes it easier for them to obtain funds from the capital market, to alleviate financing constraints, and, thus, to reduce default risk. Companies that face more prohibitive financing constraints are relatively less able to service their debts and are at a higher risk of defaulting for several reasons. First, financing constraints put enterprises under significant pressure, and managers have strong incentives to default in order to gain a short respite. Second, when enterprises face financing constraints, they are more inclined to default in order to avoid having to terminate or delist the enterprise. In summary, the role of Confucian culture in inhibiting corporate default is more pronounced in companies facing severe financing constraints.

In this paper, we construct a KZ index to measure the financing constraints that enterprises face. The index is obtained from a logistic regression of operating net cash flow, cash holdings, debt level, cash dividends, and enterprise growth. The results are shown in column (1) and column (2) of Table 5, where the coefficient of the interaction term of Confucian culture and the KZ index is significantly negative. The more prohibitive the financing constraint, the more significant the effect of Confucian culture on suppressing the default risk of a firm.

Table 5. Cross-sectional analysis.

Variable	(1) EDF	(2) Violate	(3) EDF	(4) Violate	(5) EDF	(6) Violate
Confu*KZ	−0.004**	−0.194**				
	(−2.42)	(−2.35)				
Confu*MKR			−0.006***	−0.308***		
			(−3.72)	(−4.06)		
Confu*Supervise					0.001**	0.064***
					(2.22)	(3.06)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.054	0.030	0.054	0.046	0.069	0.043
Num	22175	22175	22658	22657	22658	22658

Degree of marketization

As a general matter, regions with a higher degree of marketization have higher information transparency. Therefore, firms in those regions are less motivated to default. In contrast, in regions with a lower degree of marketization, government intervention is more significant, the quality of financial accounting is lower, and the costs of default are less prohibitive. Due to reduced information asymmetries in more marketized regions, when the risk of default increases, traders can sell their shares or delay purchases. This transparency makes the threat of shareholder exit more salient and causes firms to become cautious and conservative, thus reducing the risk of default. Therefore, this paper argues that the role of Confucian culture in curbing default risk is more significant for firms in more marketized regions. Drawing on previous research, we use the China Marketization Index to measure the degree of marketization of firms. The regression results are shown in column (3) and column (4) of Table 5. As expected, the coefficient of the interaction term is negative and significant at the 1% level. Therefore, Confucian culture leads to lower default risk for firms in highly marketized regions than for firms in regions with low marketization.

External supervision

We use attention from analysts to test the impact of external supervision on the influence of Confucian culture on corporate default risk. The corresponding indicator captures the number of analysts who follow a company in a given year. The larger the value of the indicator, the higher the degree of attention and supervision. The regression results in column (5) and column (6) of Table 5 show that the coefficient of the interaction term of Confucian culture and the strength of external supervision (*Supervise*) is significant and positive, at least at the 5% level. This indicates that the weaker the external supervision, the more significant the suppressive effect of Confucian culture on default risk. Analysts and researchers can monitor the default behaviour of an enterprise. Companies that are subject to close external supervision, even if not guided by informal institutions such as Confucian culture, have lower risks of corporate default. Supervision exposes companies to large default costs and reputational losses. In other words, the marginal effect of Confucian culture on default risk is weaker for companies that are subject to extensive external supervision. In summary, Confucian culture and formal external supervision operate as substitutes in suppressing the risk of corporate default.

VI. Additional analysis

We now turn to the potential economic consequences of the influence of Confucian culture on default behaviour. Specifically, we examine five issues: internal control quality, corporate social responsibility, earnings management, corporate risk-taking, and corporate market valuation. The results are presented in Table 6.

Column 1 of Table 6 examines the effect of Confucian culture on the quality of internal control. The coefficient of the Confucian culture variable *Confu* is significantly positive, indicating that Confucian culture makes firms more disciplined and improves the quality of internal control.

Confucian culture encourages enterprises to adopt socially responsible practices proactively because firms that act in this manner are supported by more stakeholders and even by the state and society as a whole. Confucian culture is conducive to creating intensive public pressure on enterprises to fulfill their social responsibilities actively. Accordingly, this paper examines the influence of Confucian culture on

Table 6. Additional analysis.

Variable	(1) ICQ	(2) CSR	(3) EM	(4) Risk	(5) TobinQ
Confu	35.047***	2.577***	−0.043***	−0.017***	−0.205**
	(4.73)	(3.70)	(−6.01)	(−4.51)	(−2.25)
Controls	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	−0.205**
Year	Yes	Yes	Yes	Yes	(−2.25)
R^2	0.251	0.382	0.157	0.051	0.233***
Num	22652	22649	22041	22352	22182

corporate social responsibility. The regression results are shown in column (2) of Table 6. The coefficient of the Confucian culture variable *Confu* is significant and positive, indicating that Confucian culture can promote corporate social responsibility.

We also investigated the effect of Confucian culture on corporate earnings management behaviour. We find that Confucian culture has an inhibitory effect on earnings management, as is evident from column (3) of Table 6, which implies that Confucian culture also limits dishonesty among managers.

Managers tends to be risk averse because firms that are more strongly influenced by Confucian culture are more likely to emphasize corporate reputation. Such firms are less likely to take risks. Column (4) of Table 6 displays the effect of Confucian culture on corporate risk-taking. *Confu* has a significant and negative coefficient, indicating that Confucian culture reduces corporate risk-taking.

Given that high risk often entails large rewards, we inquire whether reductions in risk-taking at firms are accompanied by decreases in firm value. Column 5 of Table 6 displays the effect of Confucian culture on firm valuations (*TobinQ*). The coefficient of *Confu* is significant and negative, implying that firms that are more strongly influenced by Confucian culture have lower market valuations.

VII. Conclusions

Imprinting theory posits that culture influences the decision-making behaviour of firms (Harutyunyan and Ozak 2017). Scholars have argued that Confucian culture has a significant negative impact on the social status of women in China (Du 2016). At odds with this view, we employed geographic proximity-based variables for Confucian culture and showed the connection between culture and corporate default risk, thus uncovering the positive aspects of Confucian culture. The study contributes significantly to the academic understanding of the effects of Confucian culture on corporate default risk.

We studied the impact of Confucian culture, a durable and vital Chinese tradition, on default risk. Our conclusions are statistically and economically significant. The results support the proposition that Confucian culture has a significant inhibitory effect on corporate default risk. Furthermore, we found that reputation and resources acquisition are two underlying channels through which Confucian culture can reduce default risk. The inhibitory effect of Confucian culture on corporate default risk is stronger at firms with higher financing constraints, at firms in regions with high marketization, and at firms that are subject to less strict external supervision. This finding shed light on the contrasting effects of the resource endowments of firms, underlying the importance of resource acquisition capabilities and the impact of the external environment on corporate default risk. The additional analyses suggest that Confucian culture also improves corporate social responsibility and internal control quality, that it reduces earnings management and corporate risk-taking, and that, ultimately, it decreases the overall value of the firm.

The findings of this paper have important implications for both policymakers and business managers. First, the government and regulators should pay more attention to informal institutions, such as culture, when formulating policies. The government should give full play to the role of public authorities in promoting high-quality Confucian culture and in enhancing identification with Confucian culture in society. At the same time, government policies should be tailored to local conditions and allow for regional differences, in line with the specificities of local cultural environments. In the absence of a formal system, an objective understanding of the influence of modern Confucian culture in China can help expand research on the governance of corporate default. Second, companies should cultivate culture in organizational settings and use it actively to guide and motivate the behaviour of employees and to improve the overall efficiency of corporate management. An effective mechanism for promoting the sustainable development of companies through cultural norms ought to be formed. This paper deepens the academic understanding of the mechanism by which Confucian culture affects the process of participating in corporate governance and provides effective theoretical support for further improvements to the status and the influence of traditional Chinese culture in the socio-economic sphere.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

The work was supported by the the Fundamental Research Funds for the Central Universities [202211108].

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Appendix A: Variable definitions

Variable	Definition
Size	Natural logarithm of total assets
Age	Natural logarithm of firm age from listed plus one
SOE	A dummy variable for state ownership. This variable equals 1 for state-owned enterprises, and 0 otherwise
Liquidity	Ratio of current assets to total assets
Tng	Fixed assets divided by total assets
Cfo	Proportion of operating cash flows to total assets
Lev	Firm's debt-to-asset ratio
ROA	Ratio of firm's net profits to total assets
Growth	Growth rate, which equals the percentage change of revenue per year
Turnover	Ratio of operating income to total assets
Indep	Percentage of independent director in the board
Top1	The shareholding proportion of the largest shareholder.
Balance	Percentage of the shareholding of the 2nd to 10th largest shareholder to the shareholding of the largest shareholder