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In the radiance of enlightenment: The influence of nontheistic religions on corporate default risk

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ABSTRACT

We investigate whether religious site density around a firm's headquarters is related to corporate default risk in China. We find that public firms surrounded by a higher number of Buddhist and Taoist temples are associated with lower default risk. In contrast to the widely documented impact of Western religiosity on corporate behavior, our mechanism tests indicate that lower default risk related to religious site density is primarily driven by better corporate governance and not by a surge in corporate conservatism. Finally, we find that this default risk lowering effect is more pronounced when firms also possess greater political resources.

1. Introduction

Further insight into the driving forces of corporate default risk is valuable for practitioners, regulators, and academics in any economy. In severe cases, extreme surges in default risk that occur systematically and a lack of understanding of its dynamics by lending industry agents could grind the whole financial market to a halt. Default risk goes hand in hand with the term “credit.” Its root in Latin (*credere*) means “to trust.” In this paper, we shed further light on this issue by providing the first empirical investigation to examine the relation between religiosity and corporate (expected) default risk. Specifically, could a firm be trusted more (by creditors) if it operates in a more religious environment?

As a form of institutional factor, religion has been widely documented to influence individuals' values and beliefs and, as such, their behavior related to altruism, honesty, ethics, and risk-aversion (Iannaccone, 1998; McCleary and Barro, 2006; Dyreng et al., 2012). To the extent that corporate decisions are collectively formed based on individuals who may share a common set of beliefs/values in a

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given institution (i.e., corporate culture), Hilary and Hui (2009) suggest that religiosity could informally influence organizational behavior as a whole. Despite ample evidence that religion could affect individual and organizational beliefs and behavior, there has been no direct documentation as to whether and how Eastern religiosity affects corporate default risk in the literature. We intend to shed further light on this issue, particularly from the East-China.

China provides a rich and relevant setting to investigate our research question for several reasons. Existing studies regarding the influence of religiosity on corporate aspects tend to focus on Western societies in which the major religions are monotheistic religions like Christianity and Judaism. In Eastern societies, such as China, the dominant religions are based on nontheism. The primary religions of the Chinese people are Buddhism and Taoism which do not rely on the existence of God (Potter, 2003). Rather, the teachings of Buddha and Laozi are based on “a way of life” and a “code of conduct” that formulates good moral values in a social and institutional environment.

Different systems of religion could affect individual and organizational behavior in different ways. As documented by Miller (2000) and Jiang et al. (2015), Western religions believe in the existence of one true God who offers salvation to his followers to overcome uncertainty and anxiety. In exchange, Christians, as an example, pledge their faith in the hand of God and are generally accustomed to closely following certain rules and protocols that keep things the way they are (e.g., conservatism).¹ Alternatively, Eastern religions are based on the teachings that an individual's actions matter and ultimately determine the quality of their subsequent lives. Eastern religion teaches its followers a philosophy of life and to embrace and cope with uncertainty (as part of “the” most common thing in nature) rather than to avoid it.² Thus, it is possible that followers of Western religions could be more risk-averse (Hilary and Hui, 2009; Cai and Shi, 2019) than their Eastern counterparts. Based on the differences between these two religious systems of beliefs, we are motivated to study the impact of nontheistic religiosity on default risk that has not been comprehensively addressed in the literature. Specifically, we hypothesize that Buddhism and Taoism religiosity lower the expected default risk of a firm, but possibly not through corporate conservatism as found in the U.S.

In addition, given the vast geographical area of China, there is rich variation in terms of religious site density (our main explanatory variable) across firms. To best capture firm-level unique religious environment, our main measures of religion are firm-specific and based on the number of religious sites surrounding each individual firm's headquarters. Our summary statistics indicate that the average number of Buddhist and Taoist temples is 407, 1361, and 2755 within a 100-, 200-, and 300-km radius from a firm's headquarters. These numbers can vary greatly across firms. In our sample, there are firms with no religious sites surrounding them at all. At the same time, there could be as many as 2449 Buddhist and Taoist temples within a 100-km radius for other firms. Moreover, the co-existence of religious and political influence in China is particularly worth noting. The unique Chinese setting allows us to investigate the role of religiosity when interacting with political influence in affecting corporate behavior.

Enhancing the existing literature on the impact of Chinese religiosity on corporate practice standards (Du, 2013; Du et al., 2014; Jiang et al., 2015; Cumming et al., 2016a; Li and Cai, 2016; Hu et al., 2019), we provide the first empirical investigation concerning the impact of local religiosity on a firm's expected default risk and explore whether this relation is subject to political influence. We achieve this through a sample of 2911 A-share listed Chinese firms from 2003–2020.

We propose that greater religious site density surrounding a firm formulates a collective culture that leads to lower expected default. Our baseline regression models confirm this conjecture. The findings indicate that there is a monotonic negative relation between expected default risk and religious site density. Our results are both statistically and economically significant. For the additional presence of 1000 religious sites within a 100-km radius of a public Chinese firm's headquarters, the expected default risk is reduced by about 4.4% as compared to its average in the sample. This alleviating effect also wears off monotonically when the religious site density measuring radius widens (i.e., when a firm is surrounded by religious sites, but more distantly). Specifically, similar alleviating effects of religiosity on expected default risk on 200 km and 300 km radius are about 2.2% and 1.1%, respectively. These results remain strong and robust in the robustness checks including tests addressing endogeneity concerns, tests employing alternative measures of religion and default risk, and tests with additional control of industry and provincial fixed effects.

We next explore the channel through which nontheistic religiosity reduces default risk in China. Employing a two-step mechanism test, we rule out the possibility of a conservatism channel, as found in the case of U.S. corporations by Hilary and Hui (2009) and Cai and Shi (2019), in favor of a better corporate governance practices channel. This is in line with the existing literature linking religiosity and better corporate governance practices in China (Du, 2013; Du et al., 2015; Hu et al., 2019).

Finally, we demonstrate that the relation between religion and default risk is conditional upon the degree of political exposure experienced by the firm and not subsumed by the collectivism culture in the area. Our results suggest that religious social norms play a more significant role among firms located in provinces that have a higher proportion of Chinese Communist Party members and among State-Owned Enterprises (SOE) firms. Consistent with the political resource-based theory, Chinese firms with political connections, such as SOEs, may be more exposed to tunnelling and agency issues (Milhaupt, 2020; Liu et al., 2023; Lu et al., 2023). As a result, religiosity, with the mediating role of better corporate governance, could become relatively more impactful in reducing unethical practices that lead to higher default risk in these corporations. Moreover, while it is possible that areas with higher religious site density coincide with the collectivism culture (e.g., rice culture), our results suggest that this confounding effect, if any, does not subsume our main findings. Religiosity still significantly lowers the expected default risk of a Chinese firm after considering the possible similar effect the collectivism culture (e.g., sense of community) may have on corporate default risk.

¹ We note that Christianity includes both conservative and liberal churches. Nevertheless, the majority (or at least a good proportion) of Christians in the West, especially in the U.S., are conventionally associated with conservatism, especially since the 1980's.

² In fact, the word “crisis (or risk)” in Chinese also means ‘opportunity’ (危机).

We contribute to the existing literature in four ways. Our study adds to the very limited research on the impact of religiosity on corporate default risk. Most related to our paper is the study by [Chen et al. \(2016\)](#), who find that religiosity is associated with a lower cost of debt among 29 sample countries. They also mention the inverse relation between religiosity and expected default risk in an informal (untabulated) test. However, most of their sample countries represent theistic religions (e.g., Christianity and Islam) and China is not included in their study. Filling the gap, we provide the first comprehensive empirical investigation regarding the impact of nontheism (Buddhism and Taoism in particular) on firms' default risk.³

Additionally, and more importantly, our study provides a new angle as to how the religiosity of different beliefs could lead to the same ultimate outcome but through different means/mechanisms. As shown in [Chen et al. \(2016\)](#), while the impact of religiosity on lowering firms' default risk (and formally lowering the cost of debt in their study) is found in both Western (most of the sample) and Eastern (one-sixth of the sample) economies, it is not clear whether the alleviating effect is achieved through higher ethical standards (e.g., better corporate governance) or simply conservatism. Our results shed further light on this issue by showing that at least from the Eastern religion angle, as evidenced in China, religiosity affects the default risk via strengthened governance, not risk avoidance. We thus add to the literature by showing that different systems of religion could affect individual and organizational behavior in different ways. As documented by [Miller \(2000\)](#) and [Jiang et al. \(2015\)](#), Western religions believe in the existence of one true God who offers salvation to his followers to overcome uncertainty and anxiety. In exchange, Christians, as an example, pledge their faith in the hand of God and are generally accustomed to closely following certain rules and protocols that keep things the way they are (e.g., conservatism). Alternatively, Eastern religions are based on the teachings that an individual's actions matter and ultimately determine the quality of their subsequent lives. Eastern religion teaches its followers a philosophy of life and to embrace and cope with uncertainty (as part of "the" most common thing in nature) through mindfulness rather than avoiding it. As a result, it is possible that followers of Western religions could be more risk-averse ([Hilary and Hui, 2009](#); [Cai and Shi, 2019](#)) than their Eastern counterparts.

Moreover, our cross-sectional tests yield incremental insight concerning the above effects in the presence of political and other cultural influences that are particularly important in China ([Li and Zhang, 2010](#); [Li et al., 2015](#); [Liu et al., 2019](#)). In other words, we provide additional evidence as to how political influence and other cultural aspects, such as collectivism, could interact with religiosity in shaping corporate behavior in modern China. It is also worth noting that the existing literature often fails to distinguish between the effects of a firm's religious environment and firm managers' personal religious beliefs ([Ma et al., 2020](#)). We also account for that in this study. Our results indicate that both firm-level and manager-level religiosity matters to a firm's likelihood of default.

Lastly, we compliment the emerging strand of literature that documents how informal culture formulated within an institution could formulate a set of business practices and behaviors that impose significant financial impacts on firms. [Hilary and Hui \(2009\)](#) show that firms in religious U.S. countries are relatively more risk averse and take less risk, leading to less volatile stock returns and profitability (Returns on Assets). In the cross-country setting, [Díez-Esteban et al. \(2019\)](#) confirm [Hilary and Hui's \(2009\)](#) findings with a sample based on 37 nations. The corporate conservatism is shown to be stronger for countries with Catholic and Islamic-based religions. However, the vast majority of their sample covers countries with western religions. Among others, [Guiso et al. \(2015\)](#) stress the importance of corporate culture and its value to corporations. They generally post the question of what dimensions of corporate culture matter to a firm's performance and why. We add to the bulk of such literature by examining how Eastern religiosity (as a form of informal corporate culture) could have a financial impact on a firm's default risk.

2. Literature review and hypothesis

2.1. Religious environment and firm default risk

Expected default risk crucially matters to creditors as they are exposed to the adverse consequences induced by moral hazard issues when lending money to any borrowers including corporations. The inability to control borrowers' behavior and actions after a loan is granted makes it important for creditors to appraise the trustworthiness of their clients. We argue that the religious environment/culture surrounding levered corporate borrowers offers another insightful indicator that has been less studied in the literature.

In the social science literature, researchers find that religiosity can influence individuals' behavior and outlook in many ways. For example, previous work studying Western religion finds that attentiveness to church activities is positively related to loyalty and a marriage's institutional commitment ([Wilson and Musick, 1995](#)). In the same vein, criminal behavior can also be deterred by religious beliefs ([Bainbridge, 1989](#); [Baier and Wright, 2001](#)). In other words, religious individuals generally adhere to covenants made and are, as such, more trustworthy. Corporate behavior and culture are collectively formulated based on individuals who work and interact together under common goals and environments. [Hilary and Hui \(2009\)](#) suggest that individual attitudes and religiosity influence organizational behavior as a whole. In their argument, organizations should be fairly homogeneous as people choose to work in an environment/culture that has a similar personality profile to their own. As an example, religious managers are also more likely to hire a larger percentage of religious employees. This translates into clustered religious individuals who, in turn, shape the managerial style, corporate culture, and employee behavior of an organization. At the country level, [Stulz and Williamson \(2003\)](#) find that religion is an even more powerful predictor of cross-country variations in creditor rights (i.e., fairness to creditors-trustworthiness) than trade openness, language, and income per capita.

Firms that follow the best ethical practices also tend to adhere to the best corporate governance practices ([Diacon and Ennew, 1996](#);

³ In another limited strand of literature, researchers link religiosity to individuals' default risk. However, they are also limited to Christianity and Islam ([Hansen and Hansen, 2008](#); [Baele et al., 2014](#)).

Rossouw, 2005; Fernando, 2010). As stated by Weaver and Agle (2002), higher ethical standards attached to religiosity generally serve as a key civil mechanism in constraining self-serving corporate behavior and practices. In other words, religiosity (or religious environment) can lead to a reduction in agency problems; that is, the sub-optimal moves made by corporate managers at the expense of capital providers (including creditors). To the extent that corporate governance is the mechanism put in place to cope with the conflict of interest between rent-seeking corporate insiders and long-term financiers of a company, firms in higher religious site density should demonstrate superior corporate governance standards. Grullon et al. (2010) provide empirical evidence in support of this view. They demonstrate that firms in a more religious area are less engaged in poor corporate governance activities, such as backdating options, overpaying executives, and irregular financial reporting. As a result, these corporations are less prone to class-action securities lawsuits. McGuire et al. (2012) and Dyreng et al. (2012) demonstrate a similar point through the detailed perspective of earnings manipulation and financial reporting standards.

While relatively less investigated, a few Chinese studies also document the positive influence of Buddhism and Taoism religious site density on corporate governance practices. Du (2013) finds that Chinese firms registered in higher religious site density areas are associated with lower expense ratios, an indication of lower owner-manager agency issues. In the same vein as the U.S. studies, Du et al. (2015) demonstrate that social norms placed on Chinese firms surrounded by more Buddhist and Taoist temples discourage them from engaging in earnings management activities. Nontheistic religiosity in China also encourages ethical entrepreneurship (Du et al., 2014; Cumming et al., 2016b) and the use of high-quality audit services (Hu et al., 2019). As Li and Cai (2016) suggest, stock price crash risk is also moderated by religiosity as religion reduces Chinese managers' tendency to withhold bad news, manipulate earnings, or consume perks. These findings are consistent with the philosophy promoted by Buddhism and Taoism. Buddhism and Taoism emphasize the logical consequences (with no or less intervention from the gods) of personal actions and offer guidance on proper/ethical codes of conduct. The religious followers believe that an individual's personal deeds matter as they carry rippling consequences (Miller, 2000).⁴

Overall, the above suggests that religious social norms enhanced by religious site density promote higher ethical standards within the corporate practices/culture (e.g., better corporate governance) of a Chinese corporation. To the extent that this would further discourage self-serving managers from engaging in business activities that unfairly divert cash flows away from debtholders, religiosity should improve the trustworthiness of a corporate borrower in the eyes of a creditor. It is thus intuitive to hypothesize that religiosity reduces a firm's expected default risk in China:

H1. Chinese firms located in areas with a higher density of Buddhism and Taoism religious sites are associated with lower levels of expected default risk, all other things equal.

H2a. The alleviating effect of religious site density on corporate default risk in China is due to better corporate governance practices.

In addition to business ethics/governance, conservatism norms could also contribute to the inverse relation between religiosity and corporate default risk based on Western religiosity evidence. Absolute faith and trust in one true God may foster many believers to become accustomed to raising fewer questions and sticking to the same protocols/structures thus avoiding changes and uncertainty to preserve stability-conservatism. In the social science literature, adherents of Western religion tend to show a greater degree of risk aversion than their non-religious counterparts do. For example, irreligious individuals are more likely to engage in risky activities, such as smoking and drinking (Miller and Hoffmann, 1995; Miller, 2000). Regarding economic activities, household finance literature finds that irreligious individuals are more likely to hold stocks rather than Treasury bills, consistent with the view that the level of religiosity is positively correlated with the degree of risk aversion (Barsky et al., 1997). Endorsing that the culture of an organization is generally aligned with the local environment of the firm, Hilary and Hui (2009) report that managers of firms located in U.S. counties with high levels of religiosity tend to be more risk averse resulting in higher required rates of return and lower rates of investment and long-term growth. This is consistent with additional evidence presented by Adhikari and Agrawal (2016) that U.S. firms headquartered in areas that are more religious are less innovative as they are rather risk averse. Cai and Shi (2019) also provide direct evidence that U.S. firms located in more religious areas use relatively less debt financing thereby receiving higher credit ratings. Additionally, Ma et al. (2020) find a similar result that U.S. companies located in areas with higher levels of religion are associated with greater accounting conservatism. All of these studies point to the role of Western religiosity in limiting risky corporate behavior that, in turn, is encouraging to creditors when coping with moral hazard issues and ultimately lowers expected default risk.

Although risk aversion could serve as a channel through which religion reduces default risk in Western societies, we argue that this channel may not necessarily apply in the Chinese context. Different from the West, religions in China are overwhelmingly dominated by Buddhism and Taoism, which are nontheistic.⁵ Theistic religions in Western societies, such as Christianity, believe in the existence of one true God. His followers can pray and adhere to God's word and certain commandments. In return, they are given God's grace to overcome (or avoid) uncertainty and anxiety (e.g., blessed). However, nontheistic religions, such as Buddhism and Taoism, teach their

⁴ Another important distinction between Eastern and Western religions is how many lives one gets to live to make things right. Western religions suggest "one shot," while Eastern religions indicate reincarnation, except for the extremely rare case of Nirvana.

⁵ Holy figures (called Bodhisattwa including the original Buddha himself) are revered aspiring figures (role models in pursuing dharma (the right ways) and thus enlightenment), not gods. This is in the way of the Mahayana branch of Buddhism (most influential in China, Japan, and Korea).

followers to embrace and face uncertainty as an unavoidable reality of life on one's own terms, but with high consciousness-a heightened state of awareness and understanding of one's surroundings (Miller, 2000). Supporting evidence has also been documented by Jiang et al. (2015) who find that family firms with religious founders are associated with less risk compared with other family firms, but this finding only holds for entrepreneurs who adhere to Western religion, but not Eastern religion. Thus, we propose that the risk aversion channel through which religiosity reduces the expected default risk does not apply to Chinese public firms:

H2b. The alleviating effect of religious site density on corporate default risk in China is not due to corporate conservatism.

2.2. Political influence on religion

Studying religiosity in China provides a unique setting to explore the role of political influence on corporate behavior. With communism, political influence on corporations is relatively more direct and broader than in a democratic society. This represents a channel that could affect the role of religiosity in shaping corporate behavior.

Buddhism and Taoism are the two religions that have a substantial influence on both ancient and modern Chinese society. Both religions have a long history in forming the beliefs and thoughts in Chinese culture. They have close ties to historical political events and background. While Buddhism and Taoism had guided ancient Chinese society for thousands of years, they were dramatically shaped and re-shaped by a series of political events following the collapse of the last Dynasty (Qing Dynasty) in 1912 and the founding of the People's Republic of China in 1949. From 1966–1976, China initiated the Cultural Revolution during which the Chinese Communist Party promoted atheism as a fundamental doctrine and terminated all religious activities. The ruling Chinese Communist Party is guided by Marxism and Leninism from the former Soviet Union and believes in atheism. Nevertheless, after China's reform and opening up in 1978, religion has regained its vitality. The Chinese Communist Party acknowledged the importance of religious pluralism. Remarkably, religion is now an inseparable part of modern Chinese society.

Despite its revival, religiosity in China is still subject to political influence to some extent. Given the strong presence of political influence in China, how religiosity conditionally plays a role in affecting a firm's aspects, such as expected corporate default risk in this environment, remains a largely unanswered question. We conjecture that firms' political exposure could alter the religious impact on corporate default risk in two opposing ways. On one hand, political influence can hinder this effect. Above all, it is noteworthy that members of the Chinese Communist Party are, at least, officially atheists. In other words, religious followers (as formally declared) are unable to join the Party. At the same time, it has been well established in the literature that the Chinese Communist Party plays a significant role in Chinese State-Owned Enterprises (SOEs), especially in the placement of senior managers for these companies (Aivazian et al., 2005; McGregor, 2010; Liu and Zhang, 2019). The majority of the personnel in SOEs, especially at the senior level, are essentially Chinese Communist Party members who promote atheism (Liu and Zhang, 2019). If this proposition prevails, we expect to find a weaker religiosity impact on corporate default risk (i.e., a smaller reduction in default risk) among firms with greater political exposure. Alternatively, when derived from the resource-based theory, politically connected firms, such as SOEs, may be showered (or over-showered) with richer resources (e.g., financial resources and insider governmental information) that could enhance their competitive advantage (Bonardi, 2011; Duchin and Sosyura, 2012; Kim and Zhang, 2016). These plentiful resources should inherently reduce a firm's default risk by construction. However, Chinese SOEs are also widely criticized for opportunistic tunnelling activities and inferior corporate governance quality. As discussed by Milhaupt (2020) and Liu et al. (2023), managers-owners agency issues in Chinese SOEs represent an interesting paradox. In principle, while the aligning of interests is ideal as politically executives should act in the best interest of the government (and the Chinese public as the ultimate owners) who hires and supposedly closely monitors them, pay gaps and other tunnelling activities tend to be particularly prevalent in these companies when compared to privately held firms. This could be due to a lack of real and effective monitoring. SOEs are also, at certain points, less profitable than their counterparts are. In the same vein, Lu et al. (2023) provide empirical evidence that the Chinese public places greater value on overseas direct investment invested by non-SOEs. They also find that overseas investment projects by SOEs were more likely to follow a government agenda (e.g., the 2013 One Belt One Road initiatives) that may not be necessarily optimal to the cash flow prospects of the company as perceived by the public.⁶ If this proposition prevails, it is also plausible that the alleviating role of religiosity on corporate default risk will be more prominent among politically influenced organizations, such as SOEs. These firms can enjoy the improved ethical standards brought about by religiosity more than their counterparts can.

Based on the above arguments, we propose that firms exposed to greater political influence (SOEs or firms located in regions with a higher proportion of Communist Party members over the total population) are associated with a different degree of reduction in expected default risk induced by religiosity.

H3a. Firms' religiosity plays a less significant role in reducing firms' expected default risk when firms have greater political exposure.

H3b. Firms' religiosity plays a more significant role in reducing firms' expected default risk when firms have greater political exposure.

⁶ We note that the poorer corporate governance among Chinese SOEs as widely perceived by the public is subject to debate. The issue itself is also complex and worth future study. For reviews, please read Clarke (2003), Milhaupt (2020), and Liu et al. (2023), among others.

3. Data and methodology

3.1. Sample and data

Our sample includes all listed A-shares firms with the exclusion of firms from the finance industry or those classified as special treatment (ST) or particular transfer (PT) firms. Following Du (2013), firms with net assets or shareholder equity below zero are also excluded. Furthermore, in line with Li and Cai (2016), we extend the exclusion to those firms that experienced a delisting restructuring during the sample period. After all the filtering, our final sample includes 2911 firms from 2003–2020 with a total of 26,306 firm-year observations. We obtain our data from the China Stock Market and Accounting Research Database (CSMAR) and the Wind Database. Finally, we winsorize all continuous variables at the 1st and 99th percentiles to limit the impact of outliers.

3.2. Measuring religion

Although the number of religious sites, the religious population relative to the total population, and the extent of religious participation are commonly used in previous studies (Hilary and Hui, 2009), the latter two measures cannot be applied in the Chinese context due to the unique nature of religiosity in Chinese Buddhism and Taoism. As explained by Du (2013), believers do not go to Buddhist monasteries and Taoist temples on a regular basis making it difficult to estimate accurate numbers of the religious population or participation. Thus, we follow previous Chinese studies (Du, 2013; Hu et al., 2019) to measure firm-specific religiosity by calculating the number of religious sites (combining both Buddhist monasteries and Taoist temples) within a certain radius of each firm's geographical location. Buddhism and Taoism are the two dominant and most influential religions in China that have extensive influence among their followers due to their historical development, religious heritage, and intergenerational inheritance (Du, 2013).

CSMAR comprehensively reports the distribution of 34,059 Buddhist monasteries and 8342 Taoist temples for a total of 42,401 religious sites across all 31 regions of mainland China (22 provinces, five autonomous regions, and four municipalities). Fig. 1 plots the geographical distribution of the total religious sites on a map of China. We also separately plot the distribution of Buddhist monasteries and Taoist temples in Figs. 2 and 3. A darker color on the map indicates a higher density of the monasteries/temples in a given province. Interestingly, Zhejiang, Fujian, and Jiangxi provinces are consistently the most religious for both Buddhism and Taoism. In general, Southern China is more religious than the North.

Next, we obtain the registered address and the corresponding longitude and latitude of all the religious sites and sample firms and then match them to derive three alternative firm-level religiosity measures: $Religion100_{i,t}$, $Religion200_{i,t}$, and $Religion300_{i,t}$ based on a radius of 100 km, 200 km, and 300 km within firm i 's location in year t , respectively.⁷ Our measures of religion are similar to Du (2013).

Religion has been measured in other ways in the literature, mainly relying on self-reported individual-level data. Some are based on the number of religious adherents to the total population in an area (Hilary and Hui, 2009; Callen and Fang, 2015; He and Hu, 2016), while others use the number of volunteers in churches and the number of individuals who read religious books and watch religious television programs (Ellison, 1991). Compared to these measures, our measures have the advantage of being less affected by the representativeness of the survey or the subjective nature of the responses. Moreover, since our main measures of religion are firm-specific (i.e., based on the number of religious sites surrounding each firm's headquarters), our results are less subject to the problem of cross-sectional self-correlation when prefectural/county-level, province-level, or regional level religion measures are used (Wines and Napier, 1992).

3.3. Measuring default risk

Following Furfine and Rosen (2011), we adopt Moody's KMV as our main measure for the firm's expected default risk. Moody's KMV has been widely used to capture default risk in previous studies (Covitz and Downing, 2007; Tang and Yan, 2010; Furfine and Rosen, 2011; Chen and Chu, 2014). The data of Moody's KMV is readily available from CSMAR. We briefly explain the three-step calculation process below:

$$\sigma_{Vi,t} = \frac{Equity_{i,t}}{Equity_{i,t} + Debt_{i,t}} \times \sigma_{Ei,t} + \frac{Debt_{i,t}}{Equity_{i,t} + Debt_{i,t}} \times (0.05 + 0.25 \times \sigma_{Ei,t}) \quad (1)$$

$$DD_{i,t} = \frac{Market\ Value\ of\ Assets - Default\ Point}{Market\ Value\ of\ Assets \times Asset\ Volatility} = \frac{V_{i,t} - Debt_{i,t}}{V_{i,t} \times \sigma_{Vi,t}} \quad (2)$$

$$Expected\ default\ risk_{i,t} = N(-DD_{i,t}) \quad (3)$$

⁷ We calculate the distance between two points by using the Vincenty formula, which is more accurate than the alternative method of Haversine's formula in our context. Vincenty's formula calculates the distance based on a reference ellipsoid, while Haversine's formula is based on a sphere that is more effective only when calculating distances between near-antipodal points. More specifically, the following formula is used where φ_R and φ_F are the corresponding latitudes of the religious sites and firms, and λ_R and λ_F are the associated longitudes: $cos\theta = sin\varphi_R \times sin\varphi_F + cos\varphi_R \times cos\varphi_F \times (\lambda_R + \lambda_F) \text{radian} = \frac{40075.04}{360} \times \frac{180}{\pi} \text{distance} = \text{radian} \times (\pi/2 - \arctan(cos\theta/\sqrt{(1 - [cos]^2\theta)}))$.

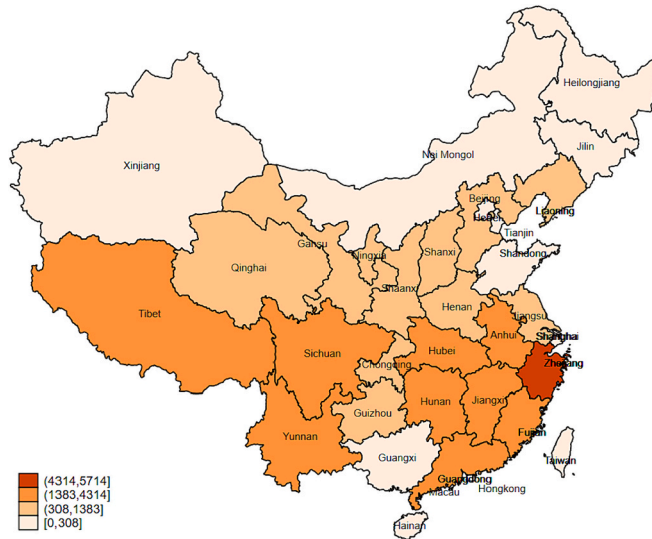


Fig. 1. All Religious Sites (Buddhist Monasteries and Taoist Temples Combined).

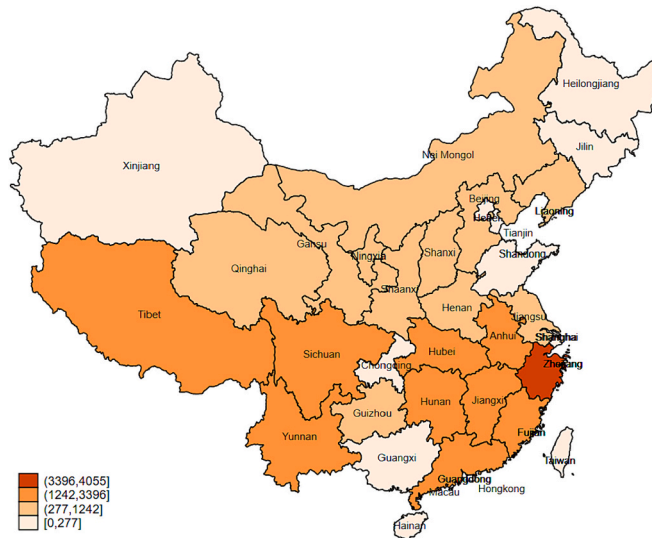


Fig. 2. Buddhist Monasteries.

where for each firm i in each year t , $Equity_{i,t}$ is the market value of equity calculated as the product of the number of shares outstanding and the annual closing stock price (Bharath and Shumway, 2008), $Debt_{i,t}$ is computed as the sum of current liabilities and one half of the long-term debt at the end of a year (Duffie et al., 2007).⁸ $\sigma_{Ei,t}$ is the annualized stock return volatility equal to the standard deviation of monthly stock returns in a year. $\sigma_{Vi,t}$ measures the volatility of firm i 's assets per Eq. (1). In Eq. (2), $V_{i,t}$ is the total value of the firm and $Debt_{i,t}$ represents the financial distress default point for each firm (Furfine and Rosen, 2011). $DD_{i,t}$ measures a firm's distance-to-default. Then, in Eq. (3), where $N(\cdot)$ is the cumulative standard normal distribution function. The expected default frequency is estimated as $ExpectedDefaultRisk_{i,t}$.

Our main default risk measure offers several advantages. First, it simplifies the estimation process of the Merton (1974) option

⁸ Vassalou and Xing (2004) note that it is essential to take into account firms' long-term debt when considering their overall default risk as interest obligations of long-term debt form a part of the firm's short-term liabilities and the firm's ability to borrow short-term liabilities is dependent upon the scale of their long-term debt. Duffie et al. (2007) take 50% of the long-term debt into account by following Moody's KMV, which is a leading provider of estimates of firm default probabilities that argues the tipping point for default is between current liabilities and half of the long-term debt.

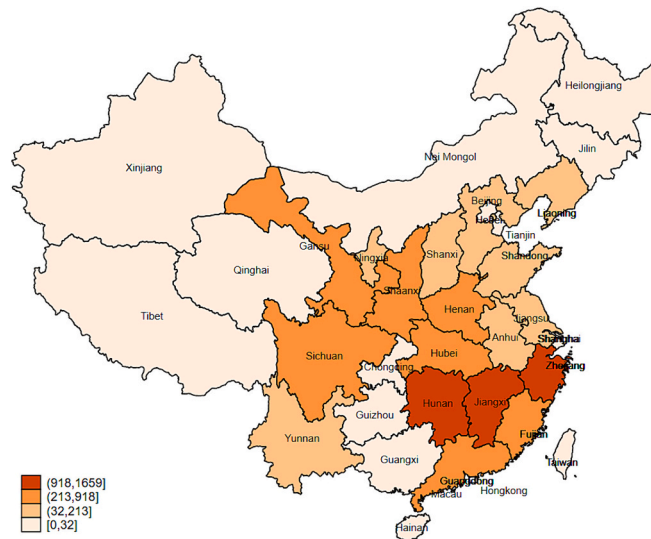


Fig. 3. Taoist Temples.

pricing model widely used to estimate corporate default risk. In addition, different from traditional accounting-based models, the structural model above takes into account the time variance of the default risk. Moreover, while credit rating is another popular measure for default risk (Avramov et al., 2009; Löffler, 2013), many stocks have little or no analyst coverage. Therefore, sample representativeness could be affected. Additionally, to ensure robustness, we employ two alternative measures for default risk: the Altman Z-Score which has been used extensively in the literature since Altman's seminal work in 1968, and Bharath and Shumway's (2008) simplified expected default risk measure. More details are provided in Section 5.3.

3.4. Baseline model

We examine the role of religious site density on firm expected default risk $ExpectedDefaultRisk_{i,t}$ in the following model:

$$\begin{aligned}
 ExpectedDefaultRisk_{i,t} = & a + \beta_1 Religion_{i,t-1} + \beta_2 Lnleverage_{i,t-1} + \beta_3 Lnequity_{i,t-1} + \beta_4 ExcessReturn_{i,t-1} + \beta_5 ROA_{i,t-1} + \beta_6 TobinQ_{i,t-1} \\
 & + \beta_7 Lnage_{i,t-1} + \beta_8 Top10_{i,t-1} + \theta' Firm + \psi' Year + \varepsilon_{i,t-1}
 \end{aligned}
 \tag{4}$$

where $ExpectedDefaultRisk_{i,t}$ is the expected default frequency for each firm i in year t . *Religion* is measured by *Religion100*, *Religion200*, or *Religion300*. We also include a range of control variables. *Lnleverage* is the natural logarithm of leverage, which is relevant as a higher debt level is positively associated with default risk. *Lnequity* equals the natural logarithm of a firm's equity. Firms with lower equity should exhibit higher default risk. *ExcessReturn* measures the firm's stock return in excess of the value-weighted market index return. Stocks with a high default risk tend to deliver anomalously low average stock returns (Campbell et al., 2008). Return on assets (*ROA*) is a common accounting-based proxy for firm profitability. More profitable firms should have a smaller default risk. The above control variables are similar to those of Brogaard et al. (2017). Furthermore, we also control for Tobin's Q (*TobinQ*), a market-based performance measure that has been extensively used in the existing literature and is particularly relevant in the context of a fast-developing market like China as it reflects the market's perceived valuation of a firm's expected future earnings (Ma et al., 2006; Chen and Tan, 2012). Firm age (as measured by *Lnage*) and shareholding concentration (as measured by the shareholding ratio of the top 10 shareholders *Top10*) are also included as additional controls (Sun and Cui, 2014). All of our explanatory variables are measured at $t-1$ to establish causality, and we detail our variables in Appendix 2. Finally, we control for firm and year fixed effects to reduce the problem of omitted variables.

4. Main results

4.1. Descriptive statistics

Table 1, Panel A reports the summary statistics of all our variables. The average expected default frequency of our sample firms is 24.90%, while the corresponding median value is 0.106 indicating a right skewness in the default risk. The standard deviation of

Table 1
Descriptive statistics.

Panel A. Summary Statistics						
VARIABLES	N	Mean	Min	Median	Max	STD
ExpectedDefaultRisk	31,805	0.249	0	0.106	1	0.313
Religion100	31,827	407	0	255	2449	436
Religion200	31,827	1361	8	989	5350	1269
Religion300	31,827	2755	31	1785	8305	2385
Lnleverage	31,827	-0.911	-2.759	-0.779	-0.106	0.560
Lnquity	31,827	21.98	19.53	21.93	25.31	1.189
ExcessReturn	30,007	0.0414	-0.827	-0.0523	2.174	0.475
ROA	31,827	0.0359	-0.228	0.0347	0.188	0.0579
TobinQ	31,827	1.869	0.871	1.463	8.178	1.203
Lnage	30,005	2.080	0	2.303	3.258	0.850
Top10	31,827	58.56	22.53	59.62	90.77	15.58

Panel B. Parametric Correlation Matrix											
	ExpectedDefaultRisk	Religion100	Religion200	Religion300	Lnleverage	Lnquity	ExcessReturn	ROA	TobinQ	Lnage	Top10
ExpectedDefaultRisk	1										
Religion100	-0.058***	1									
Religion200	-0.048***	0.891***	1								
Religion300	-0.044***	0.804***	0.954***	1							
Lnleverage	0.544***	-0.078***	-0.066***	-0.057***	1						
Lnquity	-0.103***	-0.088***	-0.079***	-0.074***	0.118***	1					
ExcessReturn	-0.112***	0.010*	0.00800	0.010*	0.011*	0.197***	1				
ROA	-0.251***	0.060***	0.060***	0.060***	-0.341***	0.180***	0.172***	1			
TobinQ	-0.372***	0.023***	0.014**	0.012**	-0.252***	0.213***	0.330***	0.115***	1		
Lnage	0.066***	-0.101***	-0.081***	-0.074***	0.241***	0.353***	0.00700	-0.162***	0.060***	1	
Top10	0.064***	0.030***	0.028***	0.026***	-0.109***	0.034***	0.00600	0.242***	-0.143***	-0.366***	1

This table reports the summary statistics (Panel A) and the parametric correlation matrix of the main variables (Panel B), respectively. *, **, and *** indicate the level of statistical significance at 10%, 5%, and 1%, respectively.

ExpectedDefaultRisk is 31.30%. It is sizeable compared to the mean value of *ExpectedDefaultRisk* indicating a large variation of *ExpectedDefaultRisk* in our sample firms. For our main explanatory variables, an average firm in our sample has 407 religious sites within a 100 km radius. The mean value increases to 1361 and 2755 when the radius is extended to 200 km and 300 km, respectively. The corresponding standard deviations are 436, 1269, and 2385 in order, implying a diverse effect of religion, if any. Moreover, [Table 1](#), Panel B documents the correlation matrix of our main variables supplying some preliminary evidence consistent with our main hypothesis. We find a negative and significant relation between each of *Religion100*, *Religion200*, and *Religion300* and *ExpectedDefaultRisk*. The signs of the correlations between *ExpectedDefaultRisk*. and the main control variables, like *LnLeverage*, *ExcessReturn*, *ROA*, and *Top10*, are also consistent with those predicted.

4.2. Multivariate analysis

We carry out formal multivariate analysis by running regression Model (4) in this section. The results are reported in [Table 2](#). Columns (1)–(3) provide the results based on *Religion100*, *Religion200*, and *Religion300*, accordingly.

We find all measures of religion show a significant negative relationship with firm default risk as hypothesized in H1. Firms with more religious sites located nearby have a lower expected default frequency. Moreover, the magnitude of the coefficients decreases monotonically with the magnitude of the radius used to construct the religion measures (i.e., the coefficients of *Religion100*, *Religion200*, and *Religion300* are -0.0442 , -0.0227 , and -0.0111 , respectively). That is, the negative effect of religion is stronger for religious sites located closer to the firm. The incremental effect for each additional religious site is stronger when the site is within a 100 km radius of the firm compared to those located within a 200 km or 300 km radius.

Additionally, firms' expected default frequency is greater for those with higher leverage, less equity, lower excess returns, lower accounting-based profitability (measured by *ROA*), lower market overvaluation (measured by *TobinQ*), more concentrated ownership (measured by *Top10*), and younger firms. The signs of the control variables align well with our expectations. Together with the sizable adjusted R-squared (around 63% in all cases), the results support the explanatory power of our model overall.

4.3. Mechanism test

In this section, we perform formal and direct tests to investigate through which channel religiosity impacts firm default risk. Following our discussion in [Section 2.1](#), we examine whether religious site density reduces default risk through better corporate governance practices. Consistent with research convention ([Defond et al., 2005](#); [Shan, 2015](#); [Schweizer et al., 2017, 2019](#)), we construct a composite index to measure corporate governance that equals the sum of a range of binary variables capturing whether firms have state ownership, foreign ownership, ownership concentration, an independent board, an independent audit committee, a Big Four auditor, a foreigner auditor, and the sizes of their board and supervisory board (detailed in [Appendix 2](#)). We then perform a two-stage mechanism test similar to [Kim et al. \(2016\)](#) and [Chen et al. \(2018\)](#). The first stage tests whether religiosity is related to corporate governance, while the second stage tests whether better corporate governance is associated with lower default risk. We present the results in [Table 3](#), Panels A and B, respectively. Panel A results indicate religion is strongly positively associated with the level of corporate governance. The magnitude of the regression coefficients, again, diminishes monotonically when the measured religious sites are located further away from the firm (regression coefficients are 0.1891, 0.0690, and 0.0362, respectively, for *Religion100*, *Religion200*, and *Religion300*, all statistically significant). In Panel B, our second-step mechanism test indicates that corporate governance reduces firm default risk consistent with the previous literature ([Cao et al., 2013](#); [Ali et al., 2018](#)). Overall, our findings lend strong support to Hypothesis H2a confirming the validity of the corporate governance channel through which religion reduces firms' default risk.

To test Hypothesis H2b, which examines an alternative channel, conservatism, we construct firm conservatism scores (*CSCORE*) following [Khan and Watts \(2009\)](#) and [Li et al. \(2017\)](#).

$$CSCORE_{i,t} = \lambda_1 + \lambda_2 SIZE_{i,t} + \lambda_3 MB_{i,t} + \lambda_4 LEV_{i,t} \tag{5}$$

where *SIZE* is the natural logarithm of a firm's total assets, *MB* is the market-to-book ratio, and *LEV* is the debt-to-assets ratio. λ_1 , λ_2 , λ_3 , and λ_4 are the coefficients estimated from the below regression:

$$\frac{EPS_{i,t}}{P_{i,t-1}} = \beta_1 + \beta_2 D_{i,t} + R_{i,t} (\mu_1 + \mu_2 SIZE_{i,t} + \mu_3 MB_{i,t} + \mu_4 LEV_{i,t}) + D_{i,t} R_{i,t} (\lambda_1 + \lambda_2 SIZE_{i,t} + \lambda_3 MB_{i,t} + \lambda_4 LEV_{i,t}) + (\delta_1 SIZE_{i,t} + \delta_2 MB_{i,t} + \delta_3 LEV_{i,t} + \delta_4 D_{i,t} SIZE_{i,t} + \delta_5 D_{i,t} MB_{i,t} + \delta_6 D_{i,t} LEV_{i,t}) + \varepsilon_{i,t} \tag{6}$$

where $EPS_{i,t}$ is the earnings per share of firm *i* in year *t*. $P_{i,t-1}$ denotes the share price in year *t-1*. $R_{i,t}$ is the buy-and-hold return, and $D_{i,t}$ is a dummy variable equal to one if $R_{i,t} < 0$ and zero otherwise.

We then perform the same two-stage mechanism test described above, but use conservatism as the channel and present the results in [Table 4](#). Panel A reports the first stage results testing how religion affects the firm conservatism score (*CSCORE*). Panel B presents the second stage results testing how the conservatism score relates to the firm expected default risk. Although our three religion measures (*Religion100*, *Religion200*, and *Religion300*) are all shown to have a positive relation with the conservatism score in Panel A, none of them have statistical significance. This finding rules out the possible relevance of the conservatism channel as proposed in H2b. Nevertheless, we acknowledge that while *CSCORE* is a commonly used proxy of accounting conservatism in the literature, which offers convenience and comparability to existing work, it has the limitation of relying on the firm's stock price to identify news and economic

Table 2
Baseline results.

VARIABLES	ExpectedDefaultRisk		
	(1)	(2)	(3)
Religion100	-0.0442** (0.03)		
Religion200		-0.0227*** (0.00)	
Religion300			-0.0111*** (0.00)
Lnleverage	0.1810*** (0.00)	0.1809*** (0.00)	0.1809*** (0.00)
Lnequity	-0.0368*** (0.00)	-0.0367*** (0.00)	-0.0366*** (0.00)
ExcessReturn	-0.0133*** (0.00)	-0.0133*** (0.00)	-0.0132*** (0.00)
ROA	-0.2841*** (0.00)	-0.2835*** (0.00)	-0.2828*** (0.00)
TobinQ	-0.0175*** (0.00)	-0.0175*** (0.00)	-0.0176*** (0.00)
Lnage	-0.0260*** (0.00)	-0.0259*** (0.00)	-0.0259*** (0.00)
Top10	0.0025*** (0.00)	0.0025*** (0.00)	0.0025*** (0.00)
Constant	1.1037*** (0.00)	1.1140*** (0.00)	1.1111*** (0.00)
Observations	26,306	26,306	26,306
Adjusted R-squared	0.628	0.628	0.628
Firm fixed effects	YES	YES	YES
Year fixed effects	YES	YES	YES

This table reports our baseline results by employing an ordinary least squares (OLS) regression from 2003–2020. We regress the firm expected default risk on our main measures for religion (Religion100, Religion200, and Religion300), respectively. Control variables include leverage (Lnleverage), firm equity (Lnequity), excess stock returns, return on assets (ROA), Tobin's Q (TobinQ), firm age (Lnage), and concentration of ownership (Top10). We also control for firm and year fixed effects and employ robust standard errors in all regressions. We report the regression coefficients with *p*-values in parentheses, and *, **, and *** indicate the level of statistical significance at 10%, 5%, and 1%, respectively.

earnings (Givoly and Hayn, 2000; Donovan et al., 2015). Our results should be interpreted with caution.⁹

4.4. Political influence

4.4.1. Firms headquartered in political environment

As discussed in Section 2.2, the level of religiosity in China could be related to political influence. In this section, we examine which one of the two competing hypotheses regarding the joint effect of political connection and religion holds true. The first proxy we employ to examine a firm's political environment, *CCParty%*, is constructed based on the provincial percentage of Chinese Communist Party members over the total population in each firm's headquarters.¹⁰ We then separate our sample into two groups based on the medium value of *CCParty%* and perform our baseline regression separately for firms located in more and less politically connected provinces. The results are reported in Panel A of Table 5. Consistent with H3b, we find the role of religiosity is negatively significant in firms located in provinces with a higher proportion of Communist Party members and these results are consistent across all three measures of religion. Compared to the full sample results, the coefficient magnitudes of the religion proxies are all greater indicating stronger economic significance of the negative relation between expected default risk and religious site density in these firms. In contrast, the effect disappears for firms located in provinces with a lower proportion of Communist Party members. The results are in line with the political resource-based theory and indicate the importance of the political environment in the relationship between religion and expected default risk. We find that when firms are simultaneously exposed to more political and religious environments, the reduction in firm default risk is further enhanced.

4.4.2. SOE vs. non-SOE firms

Additionally, at the firm level, the Chinese Communist Party has significant control over Chinese State-Owned Enterprises (Aivazian et al., 2005; McGregor, 2010; Liu and Zhang, 2019). Liu and Zhang (2019) argue the key executives in SOEs are dominantly

⁹ Wang et al. (2009) and Ruch and Taylor (2015) both offer an in-depth literature review of proxies used to measure accounting conservatism.

¹⁰ From the China Family Panel Studies (CFPS), we collect data on the proportion of Chinese Communist Party members in each province from 2012–2020. Since CFPS is only available from 2012, our analyses in this section start from this year and end in 2020.

Table 3
Mechanism test – corporate governance channel.

Panel A. First Stage Results			
VARIABLES	CG		
	(1)	(2)	(3)
Religion100	0.1891** (0.05)		
Religion200		0.0690** (0.04)	
Religion300			0.0362** (0.03)
Lnsales	0.0321 (0.13)	0.0327 (0.12)	0.0327 (0.12)
Lnsizes	-0.0509** (0.03)	-0.0512** (0.03)	-0.0513** (0.03)
Lnestyear	0.1157* (0.06)	0.1175* (0.06)	0.1187* (0.06)
Constant	2.7198*** (0.00)	2.6940*** (0.00)	2.6882*** (0.00)
Observations	16,209	16,209	16,209
Adjusted R-squared	0.614	0.614	0.614
Firm fixed effects	YES	YES	YES
Year fixed effects	YES	YES	YES
Panel B. Second Stage Results			
VARIABLES	ExpectedDefaultRisk		
CG	-0.0073*** (0.00)		
Lnleverage	0.1853*** (0.00)		
Lnequity	-0.0453*** (0.00)		
Excess return	-0.0133*** (0.00)		
ROA	-0.3140*** (0.00)		
TobinQ	-0.0171*** (0.00)		
Lnage	-0.0277*** (0.00)		
Top10	0.0027*** (0.00)		
Constant	1.2825*** (0.00)		
Observations	16,209		
Adjusted R-squared	0.644		
Firm fixed effects	YES		
Year fixed effects	YES		

This table reports the results of testing the corporate governance channel in which religion impacts the expected default risk. Panel A presents the first stage results of testing how religion impacts corporate governance (CG). We include the natural logarithm of sales (Lnsales), the natural logarithm of firm assets (Lnassets), and the natural logarithm of firm establishment year (Lnestyear) as control variables. Panel B provides the second stage results of testing how corporate governance relates to firm expected default risk. Control variables include leverage (Lnleverage), firm equity (Lnequity), excess stock returns, return on assets (ROA), Tobin's Q (TobinQ), firm age (Lnage), and concentration of ownership (Top10). We also control for firm and year fixed effects and employ robust standard errors in the regressions. We report the regression coefficients with p-values in parentheses, and *, **, and *** indicate the level of statistical significance at 10%, 5%, and 1% respectively.

Chinese Communist Party members. Therefore, SOEs are more politically connected. We then employ SOE as a second proxy for firm political resources. Similarly, we perform a subsample analysis by running our main regression in SOEs and Non-SOEs separately. The results are presented in Panel B of Table 5. The evidence corroborates our conjecture of H3b that government/political connections and religion jointly play a stronger role in reducing firm default risk as indicated by the stronger relationship between religion and firm default risk in SOEs. While there is also some evidence that religion negatively predicts expected default risk in non-SOEs, the effect is

Table 4
Mechanism test – conservatism channel.

Panel A. First Stage Results			
VARIABLES	CSCORE		
	(1)	(2)	(3)
Religion100	0.0003 (1.00)		
Religion200		0.0253 (0.44)	
Religion300			-0.0182 (0.54)
Lnsize	0.0622* (0.07)	0.0623* (0.07)	0.0622* (0.07)
BM	-0.0379 (0.75)	-0.0375 (0.75)	-0.0389 (0.74)
Lnestyear	-0.2919 (0.13)	-0.2929 (0.13)	-0.2905 (0.13)
Constant	-0.4972 (0.49)	-0.5343 (0.46)	-0.4468 (0.54)
Observations	20,200	20,200	20,200
Adjusted R-squared	0.261	0.261	0.261
Firm fixed effects	YES	YES	YES
Year fixed effects	YES	YES	YES
Panel B. Second Stage Results			
VARIABLES	ExpectedDefaultRisk		
CSCORE	-0.0003 (0.82)		
Lnleverage	0.1551*** (0.00)		
Lnequity	-0.0400*** (0.00)		
Excess return	-0.0094*** (0.00)		
ROA	-0.7046*** (0.00)		
TobinQ	-0.0063*** (0.01)		
Lnage	-0.0354*** (0.00)		
Top10	0.0027*** (0.00)		
Constant	1.2455*** (0.00)		
Observations	20,200		
Adjusted R-squared	0.660		
Firm fixed effects	YES		
Year fixed effects	YES		

This table reports the results of testing the conservatism channel in which religion impacts the expected default risk. Panel A presents the first stage results of testing how religion impacts conservatism scores (CSCORE). Details of the variable and model construction are outlined in [Section 4.3](#). Panel B provides the second stage results of testing how conservatism scores relate to firm expected default risk. Control variables include leverage (Lnleverage), firm equity (Ln-equity), excess stock returns, return on assets (ROA), Tobin's Q (TobinQ), firm age (Lnage), and concentration of ownership (Top10). We also control for firm and year fixed effects and employ robust standard errors in the regressions. We report the regression coefficients with p-values in parentheses, and *, **, and *** indicate the level of statistical significance at 10%, 5%, and 1% respectively.

Table 5
Political intervention.

Panel A. Higher vs. Lower CCParty%						
VARIABLES	Higher CCParty%			Lower CCParty%		
	ExpectedDefaultRisk					
	(1)	(2)	(3)	(4)	(5)	(6)
Religion100	-0.0574*			-0.0067		
	(0.07)			(0.87)		
Religion200		-0.0314*			-0.0123	
		(0.08)			(0.42)	
Religion300			-0.0247**			-0.0075
			(0.03)			(0.34)
Observations	9447	9447	9447	8612	8612	8612
Adjusted R-squared	0.728	0.729	0.729	0.728	0.728	0.728
All controls	YES	YES	YES	YES	YES	YES
Firm fixed effects	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES

Panel B. SOE vs. Non-SOE						
VARIABLES	SOE			Non-SOE		
	ExpectedDefaultRisk					
	(1)	(2)	(3)	(4)	(5)	(6)
Religion100	-0.1229**			-0.0282		
	(0.02)			(0.19)		
Religion200		-0.0356**			-0.0186**	
		(0.03)			(0.02)	
Religion300			-0.0160**			-0.0071
			(0.05)			(0.14)
Observations	13,567	13,567	13,567	12,350	12,350	12,350
Adjusted R-squared	0.660	0.660	0.660	0.596	0.596	0.596
All controls	YES	YES	YES	YES	YES	YES
Firm fixed effects	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES

This table reports the results for two different sets of subsample analysis on our baseline regression. The first analysis in Panel A splits our main sample into firms located in province with higher and lower proportions of Communist Party members. The second analysis, as reported in Panel B, separately examines state owned enterprises and non-state owned enterprises. We include the same set of control variables as in the baseline model. We also control for firm and year fixed effects and employ robust standard errors in all regressions. We report the regression coefficients with p-values in parentheses, and *, **, and *** indicate the level of statistical significance at 10%, 5%, and 1% respectively.

relatively weaker.

4.5. Managerial characteristics

4.5.1. Managers' religion

Our next analysis is motivated from a manager's perspective. Although our main results prove that the level of religiosity in the local area where firms are located affects firms' expected default risk through the shaping of the collective behavior of various firm stakeholders, managers' personal religious beliefs are also likely to influence firms' behavior (Stulz and Williamson, 2003; Ferris et al., 2013). Specifically, Jiang et al. (2015) find that the religion of Chinese family firms' founders influences firm risk-taking. Ma et al. (2020) suggest that CEOs' personal religiosity causes firms to adopt more conservative behavior in their accounting practices. Thus, we propose that not only the firm's religious environment but also the managers' personal religious beliefs could affect the firms' expected default risk.

To test the above propositions, we examine whether managers' personal religiosity affects firms' default risk. This test offers an alternative gauge of the impact of religiosity on firm default risk. An individual's religious background is typically formed when they are young (Erickson, 1992; Baxamusa and Jalal, 2016). There is also rich evidence that managers' early life experiences influence their firms' risk-taking behavior (Bernile et al., 2017; Chen et al., 2021). As such, we use the number of religious sites within a manager's birth province as the proxy for manager religiosity named *ReligionManager*. In doing so, we assume that the more religious sites a manager's birthplace is surrounded by, the greater the likelihood the manager is religious.

CSMAR collects birthplace data for firms' top management teams including the chairman and the general manager for 1628 of the

total 2911 firms in our sample.¹¹ When there is more than one manager's birthplace data available for a firm, we randomly select a manager for the firm to ensure valid comparisons. We then run the following model to examine the role of *ReligionManager*:

$$\begin{aligned} \text{ExpectedDefaultRisk}_{i,t} = & a + \beta_1 \text{ReligionManager}_{i,t-1} + \beta_2 \text{Lnleverage}_{i,t-1} + \beta_3 \text{Lnequity}_{i,t-1} + \beta_4 \text{ExcessReturn}_{i,t-1} + \beta_5 \text{ROA}_{i,t-1} \\ & + \beta_6 \text{TobinQ}_{i,t-1} + \beta_7 \text{Lnage}_{i,t-1} + \beta_8 \text{Top10}_{i,t-1} + \beta_9 \text{Gender}_{i,t-1} + \beta_{10} \text{Degree}_{i,t-1} + \beta_{11} \text{AgeManager}_{i,t-1} \\ & + \theta' \text{Firm} + \psi' \text{Year} + \varepsilon_{i,t-1} \end{aligned} \quad (7)$$

where *Gender*, *Degree*, and *AgeManager* additionally control for the effect of the manager's gender (1 = female, 0 = male), education level (measured as the highest education attainment), and age following Hambrick and Mason (1984) and Chen et al. (2021). All other variables are defined in the same way as Eq. (4). We report the results in Table 6, Panel A.

As expected, we find that *ReligionManager* is also inversely related to a firm's default risk frequency. The results not only confirm the explanatory power of religiosity but also highlight its long-lasting effect. In other words, a manager's religion is proxied by the level of religiosity of their birthplace. In the case where the manager no longer lives near their birthplace when they mature, the effect of their childhood religious experience still matters at a much later stage in life. Our results also lend direct support to the strand of literature studying the importance of a manager's early life experience in a firm's decision-making (Miller, 2000; Ma et al., 2020).¹²

4.5.2. Managers' age

We have now proved that a manager's personal religious background also matters to a firm's default risk. Next, we investigate whether managers' religion plays a different role on a firm's default risk when managers are from different age groups. Social science literature conventionally documents an overall aging effect with an upward drift in religious intensity and strength of beliefs over the adult lifespan (Argue et al., 1999; Bengtson et al., 2015). In our context, it is interesting to examine whether the effect of managerial religiosity intensifies as managers age.

We re-examine Eq. (7) using subsamples defined by whether the firm's manager is older or younger than the medium age of all of the managers in our sample. The results are presented in Panel B of Table 6. Again, we find evidence supportive of our hypothesis. The role of religion is only significant in the subsample of older managers.

Specifically, our results suggest that manager-level religiosity has an impact on managerial behavior and style leading to a smaller default risk for the firm. Our results complement the literature suggesting that a manager's early years' experience formed when they are young has a long-lasting effect on their decision-making in later stages of life (Bernile et al., 2017; Chen et al., 2021). Interestingly, the effect is even stronger for older managers in our context indicating early life experience does not fade, but strengthens.

4.6. Regions with collective culture

As discussed in Section 2, greater religious site density surrounding a firm may formulate (or coincide with) a collective culture that, by itself, could also lead to lower default risk. To further check whether the impact of religiosity in lowering expected default risk is merely a fabrication of the cultural effect in the same region (e.g., collectivism as in a rice culture), we re-examine our main regression in regions with a high vs. a low collective culture.

Our proxy for a collective culture is the rice cultivation index following Talhelm et al. (2014). Greater cooperation among workers is required during rice cultivation due to the complex irrigation systems and heavy labor. Therefore, it is contended that a collective culture is formed in rice-growing areas where close relationships are formed based on reciprocity. In rice-growing areas, people, at the same time, also avoid behavior that causes conflict.

Specifically, we employ the provincial percentage of rice fields (*RiceRatio*) to that of wheat, corn, and soybeans in 1980 to measure the cultural collectivism of a firm based on its headquarters location (Ge et al., 2021; Guo et al., 2021).¹³ We add *RiceRatio* into our main regression model per Eq. (4) and interact it with the main measures of religion. The results are presented in Table 7. We find that *RiceRatio* is not statistically significant in explaining firm default risk by itself. Put differently, after controlling for cultural collectivism, the relationship between firm default risk and religion remains, but the opposite does not hold. This finding lends support to our primary results that religion plays a more important role than collectivism in explaining firm default risk and is valuable beyond cultural resources. In addition, we find the interaction terms between *RiceRatio* and religion are significantly positive for all three measures of religion.

¹¹ CSMAR database only records birthplace data for chairmen and general managers. Previous studies, such as Hambrick (1994), point out that the characteristics of the management team could have greater influence than the characteristics of the CEO on organizational outcomes.

¹² Only 27.6% of managers' birthplace and company register addresses are strictly overlapped. However, managers likely prefer to work for companies in nearby regions of their hometowns, keeping everything else constant. Consistent with this notion, the correlations between *ReligionManager* and *Religion100*, *Religion200* and *Religion300* are 0.405, 0.482 and 0.502 respectively, warranting the use of *ReligionManager* as an alternative gauge to capture the impact of religion. Due to the high correlation and the significant reduction in sample size, we do not include both *ReligionManager* and *Religion100* (*Religion200*, *Religion300*) in the regression model simultaneously. Nevertheless, our main results hold if we do. The results are available upon request.

¹³ We collect the provincial rice, wheat, corn, and soybean cultivation data from the China National Bureau of Statistics.

Table 6
Managerial characteristics.

Panel A. Managers' Religion and Default Risk		
VARIABLES	ExpectedDefaultRisk	
ReligionManager	−0.0032* (0.07)	
Lnleverage	0.1804*** (0.00)	
Lnequity	−0.0440*** (0.00)	
ExcessReturn	−0.0107*** (0.00)	
ROA	−0.2836*** (0.00)	
TobinQ	−0.0174*** (0.00)	
Lnage	−0.0258*** (0.00)	
Top10	0.0025*** (0.00)	
Gender	−0.0267*** (0.01)	
Tenure	−0.0001 (0.90)	
AgeManager	−0.0002 (0.61)	
Constant	1.2504*** (0.00)	
Observations	16,941	
Adjusted R-squared	0.653	
Firm fixed effects	YES	
Year fixed effects	YES	
Panel B. Managers' Age		
VARIABLES	Older	Younger
	ExpectedDefaultRisk	
	(1)	(2)
ReligionManager	−0.0072** (0.01)	−0.0023 (0.35)
Observations	9175	7766
Adjusted R-squared	0.668	0.663
All controls	YES	YES
Firm fixed effects	YES	YES
Year fixed effects	YES	YES

This table explores whether managers' personal religiosity matters to firm default risk, and how this relation is affected by managers' age. As shown in Panel A, we first establish the relation between managers' personal religiosity and default risk, and then conduct subsample tests based on managers' age in Panel B. We include the same set of control variables as in the baseline model and add managers' characteristics as additional control variables. We also control for firm and year fixed effects and employ robust standard errors in all regressions. We report the regression coefficients with p-values in parentheses, and *, **, and *** indicate the level of statistical significance at 10%, 5%, and 1% respectively.

Table 7
Collective culture.

VARIABLES	Collective culture			
	ExpectedDefaultRisk			
	(1)	(2)	(3)	(4)
RiceRatio	-0.0049 (0.27)	-0.0038 (0.43)	-0.0014 (0.78)	-0.0005 (0.88)
Religion100	-0.1378*** (0.00)			
RiceRatio*Religion100	0.0188*** (0.01)			
Religion200		-0.0614*** (0.00)		
RiceRatio*Religion200		0.0070*** (0.01)		
Religion300			-0.0269*** (0.00)	
RiceRatio*Religion300			0.0025** (0.04)	
Lnleverage	0.1806*** (0.00)	0.1805*** (0.00)	0.1806*** (0.00)	0.1811*** (0.00)
Lnquity	-0.0367*** (0.00)	-0.0366*** (0.00)	-0.0365*** (0.00)	-0.0367*** (0.00)
ExcessReturn	-0.0133*** (0.00)	-0.0133*** (0.00)	-0.0133*** (0.00)	-0.0133*** (0.00)
ROA	-0.2844*** (0.00)	-0.2830*** (0.00)	-0.2825*** (0.00)	-0.2841*** (0.00)
TobinQ	-0.0174*** (0.00)	-0.0174*** (0.00)	-0.0174*** (0.00)	-0.0175*** (0.00)
Lnage	-0.0260*** (0.00)	-0.0259*** (0.00)	-0.0258*** (0.00)	-0.0261*** (0.00)
Top10	0.0025*** (0.00)	0.0026*** (0.00)	0.0026*** (0.00)	0.0025*** (0.00)
Constant	1.1223*** (0.00)	1.1335*** (0.00)	1.1231*** (0.00)	1.0867*** (0.00)
Observations	26,306	26,306	26,306	26,306
Adjusted R-squared	0.628	0.628	0.628	0.628
Firm fixed effects	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES

This table explores whether the religious impact on default risk is conditional upon the collective culture surrounded by the firm. We use the rice cultivation index to measure the collective culture surrounded by a firm following the convention in the literature. We add it into our main regression model and interact it with the main measures of religion (Religion100, Religion 200, and Religion300) in Columns (1)–(3). In Column (4), we only include RiceRatio in our baseline model. We include the same set of control variables as in the baseline model. We also control for firm and year fixed effects and employ robust standard errors in all regressions. We report the regression coefficients with p-values in parentheses, and *, **, and *** indicate the level of statistical significance at 10%, 5%, and 1% respectively.

5. Robustness checks

5.1. Endogeneity tests

Endogeneity could be a possible concern in our analysis. Although firm fixed effects are constantly applied, other problems, such as an unobserved determinant or multicollinearity, could still cause endogeneity. For example, the commercial use of historic temples, or building new temples, can promote local socio-economic development through tourism, real estate development and place marketing (Chan, 2005; Wang and Bramwell, 2012), thus local government's relevant policy priorities could affect the macroeconomic environment that local firms operate in. We are not able to control for this factor. To alleviate this concern, we take two alternative approaches.

5.1.1. Placebo experiment

Our first endogeneity test relies on a placebo experiment to examine causality similar to that of Zhou et al. (2023). Specifically, to determine whether the impact of a firm's religious environment on firm default risk is accidental, we randomly sample firm headquarters addresses and then recalculate *Religion100*, *Religion200*, and *Religion300*. If these pseudo values of firm-level religiosity do not predict firm default risk based on the main model in Eq. (4), then our main findings are not accidental. We perform the random sampling 1000 times and plot the estimated coefficients and p-values of the pseudo *Religion100*, *Religion200*, and *Religion300* in Exhibit 1.

Exhibit 1 reports the mean value of the estimated coefficients of *Religion100*, *Religion200*, and *Religion300* are all close to zero, which are much larger than the baseline regression coefficients, indicating pseudo firm-level religiosity has an almost null impact on firm default risk. The majority of the p-values are higher than 0.10 and are not significant at the 10% level. Our finding rejects the hypothesis that the impact of religion on firm default risk is accidental.

5.1.2. Instrumental variable regression

Our second approach employs an instrumental variable to perform a two-stage least squares analysis (2SLS). According to the theory of religious attribution, religion plays a role as a coping mechanism in adversity providing power and control to those who have suffered losses and trauma in events like natural disasters. For example, people in earthquake-prone areas are more religious (Belloc et al., 2016; Bentzen, 2019). Therefore, following Ji (2020), we use the natural logarithm of the number of geological disasters and major forest fires in each province and each year as the instruments for religion. We name the instruments *Lndisaster* and *Lnfire*, respectively.¹⁴ We postulate that natural disasters and fire-prone provinces tend toward higher levels of religiosity. Since natural disasters are largely exogenous, their occurrence should only reduce a firm's default risk by improving a firm's religious attribution.

We present our results in Table 8. The first three columns report our second-stage results. We find our main results hold by employing instrumental variable regressions for all three measures of religion. Columns (4)–(6) of Table 8 report our first-stage results to validate our selection of instruments. The results indicate, in all cases, *Lndisaster* and *Lnfire* positively relate to religion as expected. Moreover, we report the first-stage model p-values. They are statistically significant in all cases lending support to the validity of our instruments. Finally, Sargan-Hansen's J test examines the null hypothesis that overidentification restrictions are valid. The reported p-values of the Sargan statistics indicate the null hypothesis cannot be rejected further confirming that the instruments are well-identified and relevant.

5.2. Alternative measures for religiosity

We adopt several alternative measures for firm-level religiosity. First, we construct the main measures of religion (*Religion100*, *Religion200*, and *Religion300*) based on firm office addresses, rather than the registered address, and perform the same analysis per Section 4.2. The results are reported in Columns (1)–(3) in Panel A of Table 9. We find highly similar results. The magnitude of the coefficients is also close to those reported in Table 2. In addition, the choice of radius (100 km, 200 km, and 300 km) for the main analysis could be arbitrary. To reduce this concern, we alternatively employ a range of different radii to construct the measures of religion: 220 km, 240 km, 260 km, and 280 km. We re-examine our main analysis and report the results in Columns (4)–(7) in Table 9, Panel A. Again, the results are highly consistent. There is also a clear monotonic trend in the coefficients of the religion measures. The magnitude increases as the radius narrows demonstrating a greater influence of religion on a firm's default risk when the religious sites are located closer to a firm.

Additionally, as shown in Appendix 1, the influence of Buddhist monasteries appears to surpass that of Taoist temples as indicated by the number of corresponding religious sites. Notably, some provinces have a low presence of Taoist temples. Given this disparity, for the sake of robustness, we employ the number of Buddhist monasteries only as the third alternative measure of firm-level religiosity. The results are reported in Table 9, Panel B. The results based on Buddhist monasteries appear to be even stronger than the baseline results that are based on both Buddhist monasteries and Taoist temples as indicated by the magnitude of the coefficients. The results lend additional confidence to our findings.

5.3. Alternative measures for default risk

Altman's Z Score has been another popular measure for a firm's default risk since its introduction by Altman (1968). The original version of the Altman Z Score was designed to gauge the bankruptcy risk of manufacturing firms in the U.S. Later, in 2010, Altman introduced a modified version of the Altman's Z Score to predict the bankruptcy risk of Chinese firms (Zhang et al., 2010). We follow them to use $Z_{ChinaScore}$ as our first alternative measure for firm default risk per below:

$$Z_{ChinaScore}_{i,t} = 0.517 - 0.460X1_{i,t-1} + 9.320X2_{i,t-1} + 0.388X3_{i,t-1} + 1.158X4_{i,t-1} \quad (8)$$

where $X1$, $X2$, $X3$, and $X4$ are equal to the firm i 's total liabilities, net profit, working capital, and retained profit all scaled by its total assets, respectively. A score smaller than 0.5 predicts a high bankruptcy risk, while a score greater than 0.9 indicates a generally solid financial position.

Additionally, following Bharath and Shumway (2008) and Brogaard et al. (2017), we adopt a simplified Merton (1974) structural model to calculate expected default risk as our second alternative measure for firm default risk:

$$DD_{Bharath\ and\ Shumway(i,t)} = \frac{\ln\left(\frac{Equity_{i,t} + Debt_{i,t}}{Debt_{i,t}}\right) + \left(r_{i,t-1} - \frac{\sigma_{Vi,t}^2}{2}\right) \times T_{i,t}}{\sigma_{Vi,t} \times \sqrt{T_{i,t}}} \quad (9)$$

¹⁴ The data of geological disasters and major forest fires are collected from the Chinese National Bureau of Statistics.

Table 8
2SLS Regression results.

VARIABLES	Second Stage Results			First Stage Results		
	ExpectedDefaultRisk			Religion100	Religion200	Religion300
	(1)	(2)	(3)	(4)	(5)	(6)
Religion100	-0.2680** (0.04)					
Religion200		-0.0812** (0.04)				
Religion300			-0.0400** (0.04)			
Lndisaster				0.0114*** (0.00)	0.0376*** (0.00)	0.0764*** (0.00)
Lnfire				0.0107*** (0.00)	0.0352*** (0.00)	0.0715*** (0.00)
Lnleverage	0.1875*** (0.00)	0.1875*** (0.00)	0.1878*** (0.00)	-0.0009 (0.67)	-0.0028 (0.62)	0.0009 (0.94)
Lnquity	-0.0329*** (0.00)	-0.0326*** (0.00)	-0.0323*** (0.00)	-0.0022 (0.14)	-0.0035 (0.44)	-0.0006 (0.94)
ExcessReturn	-0.0135*** (0.00)	-0.0137*** (0.00)	-0.0136*** (0.00)	0.0006 (0.62)	-0.0001 (0.98)	0.0024 (0.71)
ROA	-0.3017*** (0.00)	-0.2984*** (0.00)	-0.2946*** (0.00)	-0.0056 (0.72)	0.0218 (0.60)	0.1390 (0.10)
TobinQ	-0.0188*** (0.00)	-0.0188*** (0.00)	-0.0190*** (0.00)	0.0015* (0.10)	0.0043* (0.07)	0.0042 (0.38)
Lnage	-0.0302*** (0.00)	-0.0299*** (0.00)	-0.0298*** (0.00)	0.0007 (0.75)	0.0059 (0.35)	0.0149 (0.22)
Top10	0.0023*** (0.00)	0.0023*** (0.00)	0.0024*** (0.00)	-0.0001 (0.44)	0.0003 (0.26)	0.0011** (0.03)
Constant	1.2632*** (0.00)	1.2487*** (0.00)	1.2424*** (0.00)	0.4056*** (0.00)	1.1610*** (0.00)	2.1988*** (0.00)
Observations	20,523	20,523	20,523	20,523	20,523	20,523
Adjusted R-squared	0.148	0.150	0.151	0.980	0.980	0.980
Firm fixed effects	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES
First-stage p-value				0.000	0.000	0.000
Sargan-Hansen's J test				0.287	0.293	0.294

The table reports the 2SLS regression results from 2003–2020. We employ the natural logarithm of the number of geological disasters (Lndisaster) and major forest fires (Lnfire) as our instruments for religion. We report the second stage regression results using Religion100, Religion200, and Religion300 as the measure for religion in the first three columns, respectively. The last three columns report the corresponding first stage regression results. Control variables include leverage (Lnleverage), firm equity (Lnquity), excess stock returns, return on assets (ROA), Tobin's Q (TobinQ), firm age (Lnage), and concentration of ownership (Top10). We also control for firm and year fixed effects and employ robust standard errors in all regressions. We report the regression coefficients with p-values in parentheses, and *, **, and *** indicate the level of statistical significance at 10%, 5%, and 1% respectively.

$$ExpectedDefaultRisk_{Bharath\ and\ Shumway(i,t)} = N(-DD_{i,t}) \quad (10)$$

where for each firm i in each year t , $Equity_{i,t}$ is the market value of equity calculated as the product of the number of shares outstanding and the annual closing stock price (Bharath and Shumway, 2008), $Debt_{i,t}$ is computed as the sum of current liabilities and one-half of the long-term debt at the end of a year (Duffie et al., 2007), $\sigma_{V_{i,t}}$ is the volatility of firm i 's assets per Eq. (1), $r_{i,t-1}$ represents the previous year's stock return, and $T_{i,t}$ is set to one year following the convention. $DD_{Bharath\ and\ Shumway(i,t)}$ measure a firm's distance-to-default. Then, in Eq. (10), where $N(\cdot)$ is the cumulative standard normal distribution function, we estimate $ExpectedDefaultRisk_{Bharath\ and\ Shumway(i,t)}$.

We re-examine our main model per Eq. (4) by the two alternative default risk measures. The results are presented in Table 9, Panel C. All of our main findings remain robust and consistent by using both measures.

5.4. Other robustness checks

We perform several additional robustness checks. We re-run our baseline regression model by including industry and year fixed effects and report consistent results in Panel D of Table 9. In addition, to further control for any unobserved effect from the regional level, we control for provincial fixed effects in our main regression model. Our main finding remains robust as per the results reported

Table 9
Robustness checks.

Panel A. Alternative Measures of Religion							
VARIABLES	Office Address			Other Proxies of Religion			
	ExpectedDefaultRisk						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Religion100	-0.0492*** (0.01)						
Religion200		-0.0163** (0.01)					
Religion300			-0.0078** (0.03)				
Religion220				-0.0204*** (0.00)			
Religion240					-0.0176*** (0.00)		
Religion260						-0.0151*** (0.00)	
Religion280							-0.0130*** (0.00)
Observations	26,306	26,306	26,306	26,306	26,306	26,306	26,306
Adjusted R-squared	0.628	0.628	0.628	0.628	0.628	0.628	0.628
All controls	YES	YES	YES	YES	YES	YES	YES
Firm fixed effects	YES	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES	YES
Panel B. Alternative Measures of Religion: Buddhist							
VARIABLES	ExpectedDefaultRisk						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Religion100			-0.0900*** (0.00)				
Religion200					-0.0327*** (0.00)		
Religion300							-0.0156*** (0.00)
Observations		26,306			26,306		26,306
Adjusted R-squared		0.628			0.628		0.628
All controls		YES			YES		YES
Firm fixed effects		YES			YES		YES
Year fixed effects		YES			YES		YES
Panel C. Alternative Measures of Firm Default Risk							
VARIABLES	Altman China Z-score			ExpectedDefaultRisk (Bharath and Shumway)			
	(1)	(2)	(3)	(4)	(5)	(6)	
Religion100	0.1018** (0.02)						
Religion200		0.0542*** (0.00)					
Religion300			0.0307*** (0.00)				
Observations	18,588	18,588	18,588	26,129	26,129	26,129	
Adjusted R-squared	0.712	0.713	0.713	0.373	0.373	0.373	
All controls	YES	YES	YES	YES	YES	YES	

(continued on next page)

Table 9 (continued)

Panel C. Alternative Measures of Firm Default Risk						
VARIABLES	Altman China Z-score			ExpectedDefaultRisk _(Bharath and Shumway)		
	(1)	(2)	(3)	(4)	(5)	(6)
Firm fixed effects	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES

Panel D: Industry Fixed Effects			
VARIABLES	ExpectedDefaultRisk		
	(1)	(2)	(3)
Religion100	-0.0130*** (0.00)		
Religion200		-0.0045*** (0.00)	
Religion300			-0.0023*** (0.00)
Observations	26,306	26,306	26,306
Adjusted R-squared	0.431	0.431	0.431
All controls	YES	YES	YES
Firm fixed effects	NO	NO	NO
Industry fixed effects	YES	YES	YES
Year fixed effects	YES	YES	YES

Panel E. Province Fixed Effects			
VARIABLES	ExpectedDefaultRisk		
	(1)	(2)	(3)
Religion100	-0.0324* (0.06)		
Religion200		-0.0137** (0.02)	
Religion300			-0.0064** (0.02)
Observations	26,306	26,306	26,306
Adjusted R-squared	0.607	0.607	0.607
All controls	YES	YES	YES
Firm fixed effects	YES	YES	YES
Province fixed effects	YES	YES	YES
Year fixed effects	YES	YES	YES

This table reports several robustness checks results. In Panel A, we employ our baseline regression model per Table 2, but use a wide range of alternative measures for religion instead. Columns (1)–(3) present our results using firm office addresses (rather than registered addresses) to construct the main measures of religion (Religion100, Religion200, and Religion300). Columns (4)–(7) employ alternative choices of radius (220 km, 240 km, 260 km, and 280 km) to calculate the main religion measures. Panel B utilizes Buddhist monasteries as the measurement of religion to reexamine the baseline model. In Panel C, we use Altman China Z-score and ExpectedDefaultRisk_(Bharath and Shumway) as our alternative measures for firm default risk and re-run the baseline regression. Panel D controls for industry and year fixed effects, while Panel E additionally controls for province fixed effects in the baseline model. We report the regression coefficients with *p*-values in parentheses in all panels, and *, **, and *** indicate the level of statistical significance at 10%, 5%, and 1% respectively.

in Table 9, Panel E. Moreover, as the 2008 financial crisis could cause extreme observations in terms of a firm's default risk, we exclude the 2008 observations from our sample to check for robustness. Our results are not altered by that either. To save space, we do not present the results, but they are available upon request.

6. Conclusions

As the second largest economy in the world in 2020, China's nonfinancial corporations' debt amounted to 24.84 trillion U.S. dollars.¹⁵ Further understanding of the dynamics of corporate default risk in China is vital to the sustainability of this key economic giant in the Far East. Contributing to the rich literature studying the impact of cultural and social norms on individual and corporate

¹⁵ The data on corporate debt is collected from the Statistics Research Department.

decision-making behavior, we provide the first empirical investigation that comprehensively answers how nontheistic religious site density (i.e., the number of Buddhist and Taoist temples surrounding a given firm) affects a firm's expected default risk.

Our results suggest that firms located in an area with greater religious site density are less likely to default. This finding is robust when alternative measures of expected default risk and religiosity are employed including an alternative measure of religiosity in the birthplace of individual managers.

More importantly, further analysis indicates that religion helps to reduce a firm's default likelihood by improving the corporate governance mechanism and not by the higher degree of conservatism largely documented in the West with the dominance of monotheistic religions. Our findings add to the flourishing view that religion has a material impact on economic activities. However, we achieve that through the lens of corporate default risk that has not been documented in the existing literature. Our study adds to the view that religiosity helps shape healthy corporate culture, curbs unethical behavior within a corporation, and ultimately sustains corporate well-being.

The above is particularly worth noting in the Chinese context as religions have experienced an overall surge in popularity following the "Reform and Opening Up" policy in 1978 and are continuing to rise. Specifically, the Chinese Communist Party acknowledged the importance of religious pluralism, repaired and reopened religious sites, and religious activities have been flourishing (Du, 2013). The number of religious populations in China has reached approximately 200 million accounting for 14.23% of the total population in 2018 and is growing.¹⁶ These statistics all point to the increasingly important role of religiosity in a sustainable Chinese economy and society.

Author statement

Yuruo Feng: Software, Methodology, Formal analysis, Writing- Original draft preparation, Writing- Reviewing and Editing
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Declaration of competing interest

All authors declare that they have no conflicts of interest.

Data availability

Data will be made available on request.

Appendix 1. The Number of Buddhist Monasteries and Taoist Temples in Different Provinces

This table reports the number of Buddhist monasteries and Taoist temples in each province. Due to data limitations, Taiwan, Hong Kong, and Macau data are not included.

Province	Buddhist Monasteries	Taoist Temples	Buddhist Monasteries and Taoist Temples
Zhejiang	4055	1659	5714
Fujian	3396	918	4314
Jiangxi	3259	1010	4269
Hunan	3230	952	4182
Yunnan	2606	160	2766
Hubei	2012	652	2664
Sichuan	2195	225	2420
Tibet	1786	0	1786
Guangdong	1538	218	1756
Anhui	1335	60	1395
Gansu	756	615	1371
Jiangsu	1149	167	1316
Henan	715	474	1189
Shaanxi	707	461	1168
Hebei	741	208	949
Liaoning	758	113	871
Qinghai	801	15	816
Shanxi	598	42	640

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¹⁶ In 2018, the State Council of the PRC promulgated the "China's Policies and Practices on Protecting Freedom of Religious Belief."

(continued)

Province	Buddhist Monasteries	Taoist Temples	Buddhist Monasteries and Taoist Temples
Ningxia	411	151	562
Guizhou	475	28	503
Chongqing	277	32	309
Nei Mongol	301	7	308
Shandong	214	87	301
Guangxi	221	8	229
Jilin	204	24	228
Shanghai	108	32	140
Heilongjiang	88	9	97
Xinjiang	57	1	58
Beijing	26	13	39
Hainan	20	1	21
Tianjin	20	0	20
Sum	34,059	8342	42,401

Appendix 2. Variable definitions

Variable	Definition
ExpectedDefaultRisk	Expected default frequency computed as $N(-DD)$, where $N(\cdot)$ is the cumulative standard normal distribution function.
Religion100 (200,300)	The number of religious sites within a certain radius around the firms' registered address divided by 1000.
Debt	Current liabilities plus one-half of the long-term debt.
Equity	The product of the number of shares outstanding and the annual closing stock price.
Lnleverage	The natural logarithm of the book value of debt divided by total assets.
Ln-equity	The natural logarithm of a firm's equity.
ExcessReturn	Corporate stock returns minus value-weighted market returns.
ROA	Return on assets, net profit divided by the balance of total assets.
TobinQ	The market value of assets divided by the book value assets.
Lnage	The natural log of the number of years since the firm's listing.
Top10	The shareholding ratio of the top 10 shareholders in the firm.
CSCORE	The proxy of accounting conservatism.
Lnsales	The natural logarithm of sales.
Lnsizes	The natural logarithm of firm assets.
Lnestyear	The natural logarithm of firm establishment year.
BM	Book value to market value.
EPS	Firm's earnings per share.
P	Firm's closing share price.
CCParty%	The provincial percentage of Chinese Community Party members over the total population.
ReligionManager	The number of religious sites of corporate managers' birthplace divided by 1000.
Gender	Equal to one if the manager is female and zero otherwise.
Tenure	Managers' tenure measured by the month.
AgeManager	The age of managers.
RiceRatio	The provincial percentage of rice fields to that of wheat, corn, and soybeans in 1980.
Lndisaster	The natural logarithm of the number of geological disasters within each province in a given year.
Lnfire	The natural logarithm of the number of major forest fires within each province in a given year.

Corporate governance index variable definitions

$$CG = \sum_j^9 \text{Corporate Governance Mechanism}$$

State Ownership	$State_{i,t}$ - Shares held by the state. Equal to one if the shares held by the states of firm i are less than the mean value in fiscal year t and zero otherwise (Jiang et al., 2013; Shan, 2013).
Foreign Ownership	$Foreign_{i,t}$ - Shares held by foreign investors. Equal to one if the value of firm i is greater than the mean value in fiscal year t and zero otherwise (Shan, 2013).
Board Size	$Board_{i,t}$ - Number of directors on the director board. Equal to one if the value of firm i is less than the mean value in fiscal year t and zero otherwise (Core et al., 1999).
Board Independence	$Board\ Independence_{i,t}$ - Number of independent directors on the director board. Equal to one if the value of firm i is greater than the mean value in fiscal year t and zero otherwise (Agrawal and Knoeber, 1996; Shan, 2013).
Supervisory Board Size	$Supervisory\ Board_{i,t}$ - Number of supervisors on the supervisory board. Equal to one if the value of firm i is greater than the mean value in fiscal year t and zero otherwise (Ding et al., 2010).
Independence Audit Committee	$Audit_{i,t}$ - Independent Directors of the Audit Committee. Equal to one if firm i has an independent director on the audit committee in fiscal year t and zero otherwise (Abbott and Parker, 2000).
Big Four Auditor	$Big4_{i,t}$ - Hiring a big four auditor. Equal to one if firm i hires a big four auditor in fiscal year t and zero otherwise (Peng et al., 2011).
Foreign Auditor	$Foreign\ Auditor_{i,t}$ - Hiring a foreign auditor. Equal to one if firm i hires a foreign auditor in fiscal year t and zero otherwise (Peng et al., 2011; Schweizer et al., 2017).

(continued on next page)

(continued)

$CG = \sum_j^9$ Corporate Governance Mechanism

Ownership Concentration *Ownership Concentration_{it}* - Shares held by the firm's largest shareholder. Equal to one if the value of firm *i* is greater than the mean value in fiscal year *t* and zero otherwise (Huang et al., 2011; Schweizer et al., 2017).

Exhibit 1: Placebo test

The following figures plot the distribution of regression coefficients for pseudo *Religion100*, *Religion200*, and *Religion300*, respectively, based on placebo tests.

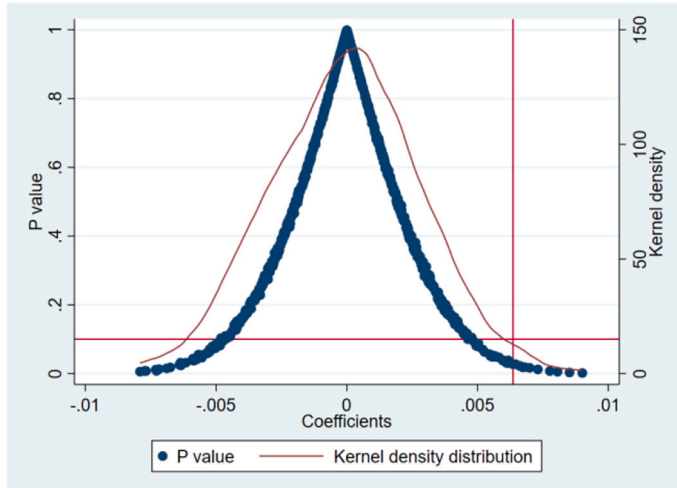


Fig. 1. Distribution of regression coefficients – Religion100.

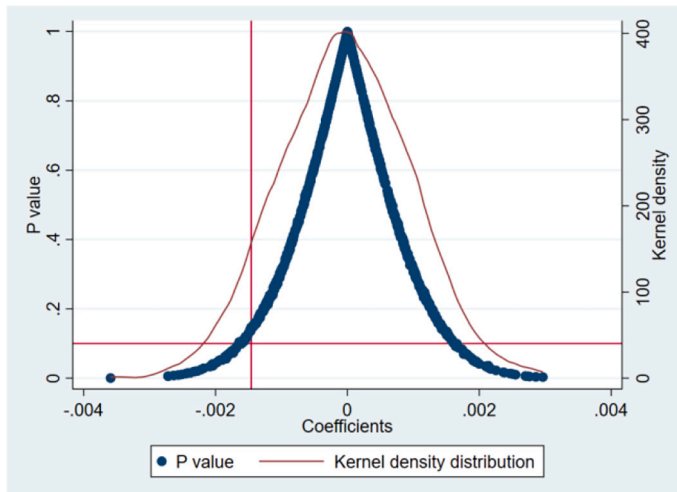


Fig. 2. Distribution of regression coefficients – Religion200.

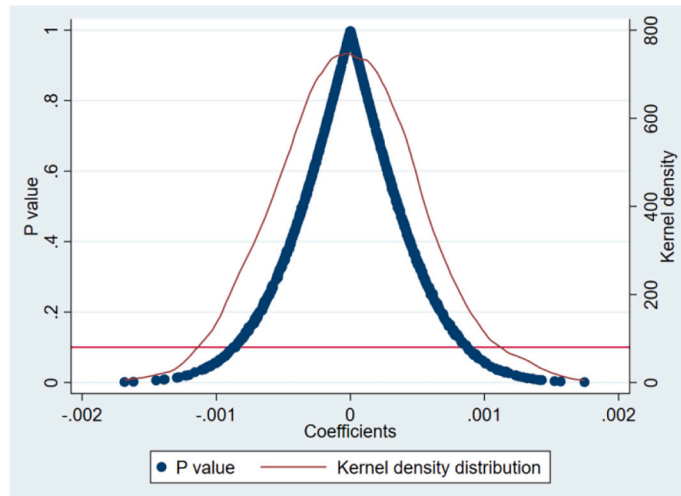


Fig. 3. Distribution of regression coefficients – Religion300.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ememar.2024.101128>.

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