

# Does Religion Matter to Owner-Manager Agency Costs? Evidence from China

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**Abstract** In China, Buddhism and Taoism are two major religions. Using a sample of 10,363 firm-year observations from the Chinese stock market for the period of 2001–2010, I provide strong and robust evidence that religion (i.e., Buddhism and Taoism on the whole) is significantly negatively associated with owner-manager agency costs. In particular, using firm-level religion data measured by the number of religious sites within a radius of certain distance around a listed firm's registered address, I find that religion is significantly negatively (positively) associated with expense ratio (asset utilization ratio), the positive (reverse) proxy for owner-manager agency costs. This finding is consistent with the following view: religiosity has remarkable effects on the way how an individual thinks and behaves, and thereof can curb managers from unethical business practices. Moreover, my findings suggest that the negative association between religion and owner-manager agency costs is attenuated for firms with strong external monitoring mechanisms such as higher Marketization and high-quality auditors. Furthermore, after separating Buddhism from Taoism, my finding indicates that above conclusions are only available for Buddhism, suggesting that different religions may have asymmetric influence on owner-manager agency costs. Above results are robust to various measures of religiosity and a variety of robustness checks.

**Keywords** Religion · Buddhism · Taoism · Owner-manager agency costs · Expense ratio · Asset utilization ratio · External monitoring mechanisms · Business ethics · China

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## Introduction

Agency theory suggests that managers may unethically grab private benefits at the expense of shareholders (Jensen and Meckling 1976). For example, managers may pay for themselves excessive salary and bonus beyond the normal level, spend excessively on entertainment, travel, and other activities, or divert cash resources to over-invest in empire-building (Jensen 1986; Jensen and Meckling 1976). Therefore, standard corporate governance mechanisms such as the independent director system, compensation scheme, proxy by mail, class suits, mandatory dividend policies, cumulative voting processes are designed and installed into contemporary corporations to restrain unethically managerial behaviors and protect the interests of shareholders.

Any formal system heavily relies on participants' behavior which determines the efficiency of the system to a great extent. In particular, in contemporary corporations, once managers take advantage of information asymmetry or private information to behave unethically, standard corporate governance mechanisms will do not work effectively, even will be only *on paper*. Arthur (1987) investigates and notes that "among the boards of directors of *Fortune* 500 companies, 95 % are not fully doing what they are legally, morally, and ethically supposed to do". Extant studies also echo my view and argue that managers' unethical behavior may be curbed by selecting and hiring ethically oriented management (Abdolmohammadi et al. 2003), establishing codes of ethics and ethical cultures (Gaumnitz and Lere 2004; Sims and Brinkmann 2003), and promoting managers internally (Petrick and Quinn 2000). Therefore, various codes of ethics and a variety of ethical cultures are also introduced into contemporary corporations, combined with standard corporate governance mechanisms, to curb managers' unethical behavior.

However, with reference to standard corporate governance mechanisms and the current status of managerial ethics in Chinese listed firms, I find it is still far from optimistic. First, standard corporate governance mechanisms such as proxy by mail, proportionate representation, and class suits have long disallowed. Moreover, during most of my sample period, there are no mandatory dividend policies or cumulative voting processes. Even worse, an independent and efficient judicial system is lacking, so existing laws, regulations, and rules are performed poorly. Here is a proof: The indexes of “Ease of doing business”, “Registering Property”, “Getting Credit”, and “Protecting Investors” provided by the World Bank (2012) showed that China ranks 91, 40, 67, 97, respectively, in 183 economies, worse than most other Asian economies such as Singapore, Korea, Thailand, Malaysia, and Japan. Without strong enforcement, investor protections are only on paper. Second, Moral hazard and adverse selection will encourage managers’ unethical behavior. Chinese listed firms’ codes of ethics are still being formed and thereof only play a limited role in restraining managers from unethical activities which tramples down the interests of shareholders.

When formal system and ethical codes do not work effectively, researchers began to turn to informal systems. North (1990) emphasizes the importance of informal system and suggests researchers to pay their attentions to economic consequence of informal system. Williamson (2000) argues that informal institutional arrangements such as culture and religion have an important impact on formal systems like law. Allen et al. (2005) and Pistor and Xu (2005) note that informal system, as an alternative mechanism, may work in emerging markets where formal system is under construction. Extant studies have addressed concerns about the influence of culture, *guanxi* (e.g., political connections) on corporate decisions. In this paper, I can also borrow support from North (1990), Allen et al. (2005), and Pistor and Xu (2005), and address the issue whether and how religion, as one of informal system arrangements, matters to agency costs between management and shareholders (i.e., owner-manager agency costs, similarly thereafter).

Arbitrarily, one may presume religion does not work in China because Chinese Communist Party members are atheism. Yes, indeed, China has 80.27 million Chinese Communist Party members by the end of 2010 and they are inclined to atheism. However, please note that more than 1.2 billion people *do* have the right to choose religious beliefs. Long repressed religious beliefs are released after the termination of political suppression in the modern Chinese society, and thus the impact of religion is bubbling to the surface.

In this paper, I focus on the influence of religion (e.g., Buddhism and Taoism on the whole) on agency costs

between management and shareholders, and whether the substitution effect between religion and external monitoring mechanisms exists in influencing owner-manager agency costs. For empirical tests, I construct a sample of 10,363 firm-years from the Chinese stock market for the period of 2001–2010. My results show that religion is significantly negatively associated with owner-manager agency costs, indicating that religion *does* matter to and reduce agency costs between management and shareholders. This finding is consistent with the following view: religiosity can curb managers from unethical business practices (McGuire et al. 2012), improve the efficiency of managers’ controlling operating costs and the efficiency of managers’ deploying assets,<sup>1</sup> and thus reduce owner-manager agency costs. Moreover, I also find that the negative association between religion and owner-manager agency costs is attenuated for firms with strong external monitoring mechanisms such as faster Marketization extent index and high-quality auditors. Finally, after separating Buddhism from Taoism, my finding indicates that above conclusions are only available for Buddhism.

My study contributes to the extant literature in several ways: First, to my knowledge, this paper firstly examines the influence of religion on agency costs between management and shareholders. To understand the impact of religion on corporate behavior is important, and religion has remarkable effect on the way how an individual thinks and behaves. Prior studies investigate the association between religion (religiosity) and business ethics (Weaver and Agle 2002; Conroy and Emerson 2004; Longenecker et al. 2004), equity pricing (El Ghouli et al. 2012), financial reporting (Dyregang et al. 2009; McGuire et al. 2012), earnings management (Callen et al. 2011), economic growth across countries (Barro and McCleary 2003), corporate decision making (Hilary and Hui 2009), emergency helping (Annis 1976) and risk (Miller 2000), but provide little evidence on the association between religion and owner-manager agency costs, one of the most fundamental economic issues. My paper addresses this gap and documents systematical evidence on whether and how religion can influence owner-manager agency costs.

Second, my paper also adds to existing ethical literature on the view that religion can serve as an alternative to standard corporate governance mechanisms (El Ghouli et al.

<sup>1</sup> In this paper, I adopt expense ratio (asset utilization ratio) as the positive (negative) proxy for agency costs between management and shareholders. Ang et al. (2000), Dang and Fang (2011), and Singh and Davidson (2003) can lend support to my proxies for agency costs. Expense ratio is used to measure the efficiency that management controls operating costs, including “excessive perquisite consumption and other direct agency costs”; Asset utilization ratio is used to measure the efficiency of managers’ deploying a firm’s assets (Ang et al. 2000).

2012). Without doubt, managerial unethical behavior such as raising their salaries beyond normal levels and spending excessively on entertainment, travel, and other perks are captured eventually by the rise of expense ratio (ER) and the decrease of asset utilization ratio (AUR). In my study, I use expense ratio and asset utilization ratio to measure owner-manager agency costs, so my conclusions that religion matters to and reduces owner-manager agency costs can lend support to the view that religion can curb managers' unethical behavior.

Third, my paper is the first to shed light on the role of religion in Chinese listed firms' behavior. Extant studies mostly fix on U.S. where overwhelming residents are Christian, but they provide little evidence on the influence of religion on corporate behavior outside of U.S. Do religious social norms still play a nontrivial role in other setting (e.g., China)? My paper addresses above gaps using religious data of Chinese listed firms and examines the impact of religion on owner-manager agency costs, a particular corporate behavior. My results suggest that religion has a significantly negative impact on agency costs between management and shareholders, and the substitution effects between religion and external monitoring mechanisms *do* exist in reducing owner-manager agency costs. These findings are very interesting in a typical "communist religious economy", which reveals that religion affects peoples' mind and further, corporate behavior in an invisible way.

Fourth, after separating Buddhism from Taoism, my study documents systematical evidence that different religions have asymmetric influence on own-manager agency costs. In particular, only Buddhism reduces own-manager agency costs. Therefore, my finding does not support the popular view that Buddhism and Taoism are the same in nature and provides additional evidence to religious literature whether different religions have asymmetric consequence on business behavior.

Fifth, I measure firm-level religious variables, which distinguishes from extant literature. Extant studies (e.g., Barro and McCleary 2003; Hilary and Hui 2009; McGuire et al. 2012) measure religion based on country-level or region-level. They adopt the number of the sites for religious activities (e.g., Churches, Mosques, etc.), the religious population proportion of the total population, and the extent of religious participation in a country or region to measure religious variables. My study adopts a new approach to measure religion as follows: (1) I utilize "Google-earth" to fix longitude and latitude of every firm-year observation's registered address and every religious site, respectively. (2) I calculate the distance between every religious site and every firm-year with reference to a well-known equation from geographic information system (GIS). (3) Using a defined distance as the criterion or the upper limit, I calculate the number of religious sites within

a radius around a listed firm's registered address, and then measure the main independent variable, i.e., RELIGION.

Finally, I provide strong and robust evidence that religion and external monitoring mechanisms (e.g., the Marketization extent and high-quality auditors) have reciprocal substitution effects in reducing owner-manager agency costs. In other words, I find the negative association between religion and owner-manager agency costs is attenuated for firms with strong external monitoring mechanisms. This finding is consistent with the following view: religion is an alternative mechanism to work and reduce owner-manager agency costs in emerging markets like China where formal system is incomplete and many external monitoring mechanisms are under construction.

The rest of this paper is organized as follows. In the next section, I discuss religion in contemporary China, review related literature, and develop my research hypotheses. Then I discuss empirical models specification and define key variables, followed by a section of the sample construction, descriptive statistics, and Pearson correlation analysis. In the following sections, I report empirical results and conduct a variety of robustness checks. Finally, I summarize my conclusions and develop ethical implications of my study.

## Institutional Background, Literature Review, and Hypotheses Development

### Religion in Contemporary China

In China, religious sites are different from western churches. First, in China, religious sites (e.g., Buddhist monasteries and Taoist temples) have not their regular ceremonies and rituals. Therefore, most adherents do not go to Buddhist monasteries or Taoist temples in a regular pattern. In comparison, western churches have their conventional festivals, and a Catholic or a Christian goes to churches in a regular pattern (e.g., every Sunday morning). Second, Buddhist monasteries and Taoist temples in China are also tourist's favorite scenic spots, and these religious sites always earn money from ticket sales. In comparison, western churches attract millions of visitors, but tourists' visits are free. Finally, both Buddhist monasteries and Taoist temples in China and western churches accept donations from their adherents. However, Buddhist monasteries and Taoist temples propagate their donors for the purpose of attracting more donations, and adherents always donate to western churches in a covert manner. It is worth noting that above-mentioned differences between Chinese religious sites and western churches lie in the form, rather than in the essence (substance). Therefore, one cannot arbitrarily presume religion doesn't work or religious

influences on business activities are less important in China than in many western countries.

Whether and how religion works in China? As the relations-based economy and the second largest economy in the world, China displays pronounced differences from other rules-based economies in its historical development, cultural and social factors, legal system, corporate governance, political system, and economic development (Kimber and Lipton 2005). The complex interaction of these factors provides the context for considering religion and its influence.

In China, Buddhism and Taoism are two most influential denominations. Buddhism is China's oldest import religion and Taoism is a genuinely Chinese religion with a very long history. In comparison, Islam, Catholicism, and Protestantism came to China later than Buddhism. Islam has survived in China since at least the eighth century C.E., and the first mosque is the Great Mosque of Xian. Christianity has gained influence over the past 200 years.

Religious activities were largely reduced from the founding of the People's Republic of China in 1949 to the termination of the Cultural Revolution in 1976, because atheism is the fundamental doctrine of Chinese Communist Party that follows the Marxism and Leninism from former Soviet Union. Since 1979, China began an unprecedented open-up reform. During the process of reform and opening, Chinese Communist Party realized that people have more diversified spiritual demand which called on religious beliefs. In fact, religion can never be eradicated in any society.

From the 1980s, a number of monasteries, temples, mosques, churches, and some other religious sites are repaired and reopened for religious activities. In the past 30 years, religious activities have been flourishing beyond expectation. Now, some Buddhist monasteries and Taoist temples are crammed during holidays and festivals, and the peak number of adherents crowded into a religious site (i.e., *Famen Si*, a famous Buddhist temple) is 216 thousand in order to worship the gods in 2012. The World Values Survey (2007, p. 59) notes that 11 % of people in China believe in a religion. Yang (2010) argues that this amount may be under-estimated. In addition, the 2011 annual official report shows that about 185 million people admit the Buddhism beliefs (Jin and Qiu 2011), but Lim (2010) quotes that 300 million is another number in the media.

Based on the aforementioned, it cannot be denied that religion is indispensable in China. Especially, in modern Chinese society, polarization of rich and poor become rampant. As a result, people turn to the traditional religion in search of comfort and transfer of resentment. Therefore, the number of religious activities and adherents are increasing. Ashiwa and Wank (2006) and Yang (2010) notice this phenomenon and urge religion-based research in

China. The current status of religion and extant literature trigger off my interest and I then further probe on whether and how religion works in contemporary firms.

## Literature Review

Adam Smith and Max Weber shed lights on the impact of religion on human being and economic activities in their works, namely, "an inquiry into the nature and causes of the wealth nations" and "the protestant ethic and the spirit of capitalism", respectively. However, religion-based research is relatively thin for a long time. Iannaccone (1998) concludes that religious factor has been neglected by social science scholars and suggests that researchers should play their attentions to religious influence on human behavior, business behavior, and even economic development. A number of scholars echo Iannaccone's suggestion (see Gundolf and Filser 2012), and the associations between religiosity and finance, accounting, economic growth, and business ethics are widely studied in both the psychology and management literatures, including experimental studies and empirical studies.

Research on the influence of religion on corporate finance and accounting behavior has produced wide results. Miller and Hoffmann (1995) propose that being irreligious is a form of risk-taking behavior and find that approximately half of the difference between male and female levels of religiosity was due to differences in their risk preferences. Miller (2000) finds that being irreligious only represents risk-taking behavior in Western (i.e., Christian and Muslim) societies, but in Eastern (i.e., Hindu and Buddhist) societies, not participating in the mainstream religion does not necessarily constitute risk-taking behavior. The reason is that religions in Eastern tend to be non-exclusive and the emphasis is on personal behavior rather than organizational affiliation.

Hilary and Hui (2009) find firms located in counties with higher levels of religiosity display lower degrees of risk exposure, exhibit a lower investment rate and less growth, but generate a more positive market reaction to new investments announcement. El Ghouli et al. (2012) find that U.S. firms located in more religious counties enjoy cheaper equity financing costs. Moreover, El Ghouli et al. (2012) also find the effect of religiosity on firms' cost of equity capital is larger for firms (periods) lacking alternative monitoring (regulation) mechanisms as measured by lower institutional ownership, implying that religion plays an alternative corporate governance role.

Dyregang et al. (2009) find that higher levels of religious adherence are associated with a lower likelihood that a restatement will *ex post* reveal income to be overstated, less *ex ante* risk that financial statements are misrepresented

because of overstated (understated) revenue/assets (expenses/liabilities), higher discretionary accrual quality, and discretionary accruals that deviate less from expectations. McGuire et al. (2012) examine the impact of religion on financial reporting and find that firms headquartered in areas with strong religious social norms generally experience lower incidences of financial reporting irregularities. Moreover, McGuire et al. (2012) also find that managers in religious areas prefer real earnings management over accruals manipulation.

Moreover, prior literature also addressed the concerns about the influence of religion on economic growth. Using international survey data, Barro and McCleary (2003) investigate the influence of church attendance and religious beliefs on economic growth. They find that economic growth responds positively to religious beliefs, notably beliefs in hell and heaven, but negatively to church attendance. They therefore conclude that economic growth depends on the extent of believing relative to belonging.

Overall, extant literature has made the impact of religion on economic, finance and accounting behaviors gradually clear. Latterly, Claims that religion can influence ethical behavior in business are plausible in recent literature.

Weaver and Agle (2002) find that religious role expectations, internalized as a religious self-identity, can influence ethical behavior, but relationships of religious role expectations to behavior are moderated by religious identity salience and religious motivational orientation. Using questionnaire survey data, Longenecker et al. (2004) find that respondents who indicated that religious interests were of high or moderate importance to them demonstrate a higher level of ethical judgment (less accepting of unethical decisions) than others. Using survey data, Conroy and Emerson (2004) find that religiosity (e.g., church attendance) is a significantly negative predictor of responses in unethical scenarios.

However, I find that extant studies provide little evidence on whether and how religion can influence agency costs between management and shareholders, a more fundamental issue of agency theory and economic. In this paper, I fill the aforementioned gap and use a sample of Chinese listed firms for the period of 2001-2010 to examine whether and how religion matters to owner-manager agency costs. The reasons why I choose the Chinese background are as follows. First, as the second largest economy in the world, Chinese economy constantly exudes its charm to stimulate scholars' interest. Second, the majority of extant studies use U.S. samples except for few cross-country analyses (e.g., Miller 2000). Therefore, related studies based on the Chinese background will be complementary to extant literature using U.S. samples.

## Hypotheses Development

Agency conflicts are widespread in contemporary corporations. Information asymmetry causes conflicts of interests between management and shareholders (Jensen and Meckling 1976). In fact, once managers own discretion over operation, agency problems may arise, and thus lead to agency conflicts because managers and shareholders have different utilities or objectives (Kurland 1995). As a result, managers may take advantage of private information to obtain private benefits, but the interests of shareholders will suffer damages, (Jensen and Meckling 1976; Fama and Jensen 1983). For example, managers pay for themselves excessive salaries and bonus which do not match their efforts or operational performances, spend firms' money on eat, drink, travel, entertainment, or other perk consumption activities, even divert firms' cash resources to over-investment for the purpose of empire-building (Jensen 1986). In fact, managers are never fully aligned with shareholders' interests. Rather, managers may act in a self-serving or even an unethical manner (Kurland 1995).

To curb managers' unethical activities and make benefits convergence between managers and shareholders, compensation schemes (e.g., stock options), internal monitoring mechanisms (e.g., supervision from the board of directors) and external monitoring mechanisms (e.g., the Marketization extent, high-quality auditors, analyst coverage/following, and institutional ownership). However, the existence of various monitoring and incentive mechanisms alone is not enough! Even some incentive mechanisms have double-bladed influence on managers in nature. Maybe the original intention of compensation scheme is to provide strong incentive for managers and to unify the benefits between managers and shareholder, but it is straight-commission compensation system (an outcome-based contract that directly rewards management for performance) that creates conflicts of interest between management and shareholders and affects managers' ethical intentions (Kurland 1995).

Note that any system needs to be performed by particular participants, so codes of ethics and intentions of participants are very crucial to compensation schemes, as well as internal and/or external monitoring mechanisms. Bonn and Fisher (2005) develop an integrated approach toward corporate governance and business ethics, and suggest that firms should integrate ethical concerns into their corporate governance structure to restrain managers' unethical behavior.

However, how to cultivate suitable codes of ethics or intentions? Prior studies argue and find that culture and religion can qualify this role (Iannaccone 1998; Miller 2000; Weaver and Agle 2002; Longenecker et al. 2004; Conroy and Emerson 2004; Callen et al. 2011). Once

religion becomes the key element of a person's self-identity, one has very low likelihood to depart himself from religious role expectations in order to avoid emotional discomfort. Therefore, religion can motivate adherents to behave themselves in line with role expectations (Sunstein 1996; Weaver and Agle 2002). Barnett et al. (1996) find that individuals with religious belief tend to hold traditional views on moral issues and have conservative moral standards. Overall, religions provide specific ethical guidelines, emphasize the overall importance of ethical behavior, and establish "common knowledge" for understanding whether experiences is ethical (Weaver and Agle 2002; McGuire et al. 2012).

Kennedy and Lawton (1998) find that the likelihood that managers are influenced by religious social norms increases in locations with strong religiosity or religious beliefs. McGuire et al. (2012) note that religious social norms are important for mitigating agency conflicts, particularly when external monitoring is weak. In the Chinese stock market, the biggest emerging market in the world, standard corporate governance mechanisms are poor, investor protections are weak, regulatory environments are ineffectual, laws are enforced ineffectively, and codes of ethics are still being formed. Therefore, religion is expected to have important impact on corporate behavior and decisions. Especially, religion should have important influence on managers in their decision-making process, and curb managers from engaging in potentially unethical business practices.

Managers have incentives to conceal their activities once they behave unethically. Note that managers' unethical behavior is eventually reflected in financial statements, so managers may manipulate financial results. Extant studies such as Conroy and Emerson (2004), Longenecker et al. (2004), and McGuire et al. (2012) argue that managers of firms located in more religious areas are less likely to manipulate financial results because CEO and management team are likely to view such behavior as unethical. Therefore, religion can not only restrain managers from unethical activities, but also curb managers from manipulating financial statements to cover such behavior.

Based on the above-mentioned, I can infer that religion is important in mitigating agency conflicts and reducing agency costs between management and shareholders for Chinese listed firms. Therefore, I formulate the following Hypothesis 1 in an alternative form:

**Hypothesis 1** *Ceteris paribus*, religion is negatively associated with owner-manager agency costs.

Note that managers' unethical activities (e.g., excessive salary, excessive perks, etc.) are captured eventually by the rise of expense ratio (ER) and the decrease of asset utilization ratio (AUR). Therefore, following extant literature such as Ang et al. (2000), Singh and Davidson (2003), and

Dang and Fang (2011), I utilize expense ratio (asset utilization ratio) as the positive (reverse) proxy for agency costs between management and shareholders. If my predictions are correct, I will be able to find that religion is significantly negatively (positively) associated with expense ratio (asset utilization ratio).

McGuire et al. (2012) emphasize the impact of various external monitoring mechanisms, and thus they examine the net influence of religion on financial reporting irregularities after controlling for institutional ownership. They provide strong evidence that religious social norms can reduce costly agency conflicts, particularly when other external monitoring is low. In this paper, I expand the work of McGuire et al. (2012) and further examine the interactive influence of religion and external monitoring mechanisms on owner-manager agency costs. In other words, I adopt the interaction item between religion and external monitoring mechanisms, rather than utilize them as control variables, to address my concerns about whether religion and external monitoring mechanisms affect jointly agency costs between management and shareholders. In other words, I predict that strong external monitoring mechanisms will blunt the influence of religion on owner-manager agency costs. To address this under-researched issue, I formulate the following Hypothesis 2 in an alternative form:

**Hypothesis 2** *Ceteris paribus*, the negative association between religion and owner-manager agency costs is attenuated for firms with strong external monitoring mechanisms.

## Empirical Models and Variables

### Empirical Models Specification

To test Hypothesis 1, I estimate Eq. (1) to link owner-manager agency costs and religion, firm-specific variables, industry dummies, and year dummies:

$$\begin{aligned} \text{ER (AUR)} = & \alpha_0 + \alpha_1 \text{RELIGION} + \alpha_2 \text{FIRST} \\ & + \alpha_3 \text{MANSHR} + \alpha_4 \text{INDR} + \alpha_5 \text{LNBOARD} \\ & + \alpha_6 \text{DUAL} + \alpha_7 \text{SIZE} + \alpha_8 \text{LEV} \\ & + \alpha_9 \text{LISTAGE} + \alpha_{10} \text{STATE} \\ & + \text{Industry Dummies} + \text{Year Dummies} + \varepsilon. \end{aligned} \quad (1)$$

In Eq. (1), ER (AUR) denotes agency costs between management and shareholders. Expense ratio (ER), the positive proxy for owner-manager agency costs, is measured as sale expenses and administrative expenses scaled by annual sales (Ang et al. 2000; Singh and Davidson 2003). Asset utilization ratio (AUR), the inverse proxy for owner-

manager agency costs, is measured as annual sales divided by total assets (Ang et al. 2000; Dang and Fang 2011; Singh and Davidson 2003).

RELIGION, the main independent variable, is measured as the number of Buddhist monasteries and Taoist temples within a radius of defined kilometer around a listed firm's registered address (see "the measure of religion" in detail). In Eq. (1), the coefficient on RELIGION (i.e.,  $\alpha_1$ ) captures the influence of religion intensity on owner-manager agency costs after controlling other determinations. Hypothesis 1 predicted that religion is negatively associated with owner-manager agency costs. Therefore, Hypothesis 1 should translate into: (1) negative coefficients on RELIGION when I adopt expense ratio as the positive proxy for owner-manager agency costs; and (2) positive coefficients on RELIGION when I adopt asset utilization ratio as the reverse proxy for agency costs between management and shareholders. In other words, with expense ratio (asset utilization ratio) as the dependent variable, if the coefficients on RELIGION (i.e.,  $\alpha_1$ ) are negative (positive) and significant, Hypothesis 1 is supported by empirical evidence.

Following Ang et al. (2000), Singh and Davidson (2003) and Dang and Fang (2011), I also include a set of control variables into Eq. (1). I include FIRST in Eq. (1) because higher ownership percentage provides for controlling shareholders sufficient incentive to monitor managers (Jensen and Meckling 1976). Therefore, higher ownership owned by controlling shareholders can alleviate agency conflicts between management and shareholders and curb managers' unethical behavior (e.g., excessive perquisite consumption and ineffective deployment of firm assets), and then reduce owner-manager agency costs. MANSHR is included in Eq. (1), because higher percentage of common shares owned by managers aligns the interests between management and shareholders and then can reduce owner-manager agency costs (Fama and Jensen 1983; Jensen and Meckling 1976).

I also include INDR, LNBORAD, and DUAL in Eq. (1) to address the concerns about the potential influence of the ratio of independent directors, the size of the board of directors, and management powers<sup>2</sup> on owner-manager agency costs, respectively (Ang et al. 2000; Singh and Davidson 2003). Moreover, SIZE, LEV, and LISTAGE are included in Eq. (1) to control for the influence of firm size, financial leverage, and a firm's listed ages on owner-manager agency costs, respectively. STATE is introduced into Eq. (1) to control for the influence of the nature of ultimate owners on owner-manager agency costs. Finally, YEAR and INDUSTRY

dummy variables are included to control for fixed effects of calendar years and industries, respectively. All the variables are defined in Table 11 in Appendix.

To test Hypothesis 2, I estimate Eq. (2) including external monitoring variables (i.e., MON) and interaction items between RELIGION and MON, i.e., RELIGION \* MON:

$$\begin{aligned} ER(AUR) = & \beta_0 + \beta_1 RELIGION + \beta_2 REGION * MON \\ & + \beta_3 MON + \beta_4 FIRST + \beta_5 MANSHR \\ & + \beta_6 INDR + \beta_7 LNBOARD + \beta_8 DUAL \\ & + \beta_9 SIZE + \beta_{10} LEV + \beta_{11} LISTAGE \\ & + \beta_{12} STATE + \text{Industry Dummies} \\ & \text{Year Dummies} + \delta, \end{aligned} \quad (2)$$

where MON denotes various proxies for the external monitoring mechanisms, and I introduced two proxies for the external monitoring mechanism into Eq. (2): the Marketization index (MKT) and high-quality auditors (BIG10). MKT is Fan et al.'s Marketization index (Fan et al. 2010), which measures the whole institution development and the investor protection level based on province-level. BIG10 equals 1 if auditor is a Big 10 accounting firm (including affiliated firms) according to the official rank of the Chinese Institute of Certified Public Accountants (CICPA) and 0 otherwise. Prior literature suggests that high quality auditors play an external monitoring role in reducing agency costs between management and shareholders (Krishnan 2003; Khurana and Raman 2004).

Hypothesis 2 predicted that the negative association between religion and owner-manager agency costs is attenuated for firms with strong external monitoring mechanisms. Therefore, Hypothesis 2 should translate into: (1) positive coefficients for RELIGION  $\times$  MKT and RELIGION  $\times$  BIG10, respectively, when expense ratio is the positive proxy for owner-manager agency costs; and (2) negative coefficients for RELIGION  $\times$  MKT and RELIGION  $\times$  BIG10, respectively, when asset utilization ratio is the reverse proxy for owner-manager agency costs.

In Eq. (2), control variables are the same as those in Eq. (1), which are defined in Table 11 in Appendix.

### The Measure of Religious Variables

In prior literature, religiosity can be measured by three distinct elements: cognitive, affective, and behavioral (Cornwall et al. 1986; Parboteeah et al. 2008). Previous studies adopts the number of the religious sites, the religious population proportion of the total population, or/and the extent of religious participation in a country or region as proxies for religion (Hilary and Hui 2009). Wines and Napier (1992) argue that these research designs and

<sup>2</sup> If one person serves as the CEO and the chairman of the board simultaneously, he/she will own more managerial power (Bebchuk et al. 2002; Core et al. 2008).

measures of religion cause different findings in extant literature. Especially, they note that country-level or region-level measure of religion should be improved because they may result in serious cross-sectional self-correlation of regression results. Therefore, in my study, I adopt firm-level religious variables to address above-mentioned concerns.

Note that it is difficult to evaluate religiosity in China. Taking Buddhism as an example, most adherents' activities are different from those of Catholic or Christian. A Catholic or a Christian goes to churches in a regular pattern (e.g., every Sunday), but a Buddhist does not go to monasteries in a regular pattern because religious ceremonies and rituals are irregular. It is also very difficult to get accurate statistics on the numbers of the religious believers because quite a few religious believers are very conservative and discreet. Therefore, I cannot refer to extant U.S. studies to utilize the extent of religious participation in a country or region as proxies for religiosity. As an alternative, I adopt the number of religious sites within a radius of certain distance (e.g., 100/200/300 km) around a listed firm's registered address to measure religious variables (i.e., religious intensity).

Extant U.S. studies define a firm's location as the place where a firm headquarters in (e.g., Hilary and Hui 2009; McGuire et al. 2012). Similarly, I use the firm's registered place instead. A firm's registered place is usually the initial place where the business started and a firm headquarters in most cases. China has approximately 16,000 Buddhist monasteries and more than 1,000 Taoist temples (Huanzhong 2003). However, different religious sites have different effects on permanent residents, temporary residents and listed firms, and it is difficult to count all the monasteries and temples, regardless of whether they are big or small, notable or not. Therefore, based upon a list issued by the *State Council of the People's Republic of China* in 1983, I narrow sites for religious activities down to national famous religious sites, including 141 Buddhist monasteries and 21 Taoist temples. These monasteries and temples are considered to have more far-reaching influence because their historical development, religious heritage, and intergenerational inheritance in followers. Finally, note that I only investigate the impact of Buddhism and Taoism. It's not only because they are predominant, but also because this study subjects to data unavailability.

The specific procedures for the measure of the religious variables (i.e., RELIGION) are as follows:

First, using "Google-earth", I check the registered address of every firm-year in my sample and fix its longitude and latitude, respectively.

Second, I check the geographic location of every Buddhist monastery (Taoist temple) which stands constantly in

the same position, and then I fix the longitude and latitude of every monastery (temple) using "Google-earth", respectively.

Third, I calculate the distance between every firm-year and every Buddhist monastery (Taoist temple) according to their respective longitudes and latitudes, following Eqs. (3–5) as below.

(i) I define the longitude and latitude of a monastery/temple (a firm-year) as  $\lambda_R$  and  $\Phi_R$  ( $\lambda_F$  and  $\Phi_F$ ), respectively, then the central angle (i.e.,  $\theta$ ) is calculated via the following Eq. (3):

$$\cos \theta = \sin \phi_R \times \sin \phi_F + \cos \phi_R \times \cos \phi_F \times \cos(\lambda_R - \lambda_F) \tag{3}$$

(ii) I calculate the arc length of per radian using the following Eq. (4):

$$\text{rad} = \frac{40075.04}{360} \times \frac{180}{\pi} \tag{4}$$

(iii) Note that the distance between two points equals the length of the *minor arc* across the surface of the earth (Rising 2000). Therefore, I calculate the distance between the location of every Buddhist monastery (Taoist temple) and the registered address of every firm-year following Eq. (5) below, which is a well-known equation from GIS:

$$\text{Distance} = \text{rad} \times \left( \frac{\pi}{2} - \arctan \left( \frac{\cos \theta}{\sqrt{1 - \cos^2 \theta}} \right) \right) \tag{5}$$

Finally, in my study, 100, 200, and 300 km are utilized as distance criteria or upper limits to calculate the number of Buddhist monasteries and Taoist temples, and then to define the variables of RELIGION100, RELIGION200, and RELIGION300, respectively.

The reasons why I choose 100, 200, and 300 km as standard distances are as follows:

(1) Because my sample only includes A-shares firms, I calculate the distance criterion based on China Mainland area, excluding three special administrative regions (i.e., Hong Kong, Macau, and Taiwan) as Eq. (6):

$$\sqrt{\frac{961.03 \times 10^4}{3.14 \times 31}} \approx 271.71 \tag{6}$$

$961.03 \times 10^4$  denotes the area of China Mainland area (unit:  $\text{km}^2$ ), 3.14 denotes circumference ratio, and 31 denotes the number of provinces, municipalities and autonomous regions in China Mainland until 2010.

(2) Based on the above calculation, I use 200 km as the distance criterion to define religious variable, i.e., RELIGION200. For the consideration of robustness, I also toughen and relax the distance criteria and use 100 km and 300 km to define RELIGION100 and RELIGION300, respectively. That is, I can obtain three main independent



variables: RELIGION100, RELIGION200, and RELIGION300.<sup>3</sup>

Firm-level religious variable has its advantage on country-level and region-level religious variable (Wines and Napier 1992).<sup>4</sup> If a monastery (temple) locates at the junction of two or more provinces, its influence will beyond provincial area restriction. Province-level religious variable fails to capture this characteristic, but firm-level religious variable can break through the limitation of administrative division because it is measured as the distance between a listed firm and a monastery (temple).

## Sample and Descriptive Statistics

### Sample and Data Sources

China is a multi-ethnic country. Chinese mainland comprises twenty-two provinces, four municipalities, and five autonomous regions of minority nationalities.<sup>5</sup> Currently, a Chinese citizen can be free to express his/her religious beliefs.<sup>6</sup> However, because of the limitation of data, I can obtain relatively complete data of Buddhism and Taoism from *the China State Administration of Religious Affairs*. Therefore, my study adopts two major religions, i.e., Buddhism and Taoism as the proxy for religion in China.

My initial sample consists of all Chinese A-share listed firms for the period of 2001–2010. Panel A of Table 1 details my sample selection process. I begin with 18,650 firm-year observations, and then select my sample in the light of the following criteria: (1) I exclude firm-years pertaining to the banking, insurance, and other financial industries. (2) I delete firm-years with transaction statuses of special treatment (ST), suspension from trading (\*ST) or

particular transfer (PT), because these firms are under the risk of delisting and may try to improve their listing status via higher discretionary accrual (Jiang and Wang 2008). (3) I discard firm-years whose net assets or shareholders equity are below *zero*. (4) I delete firms that issue shares to foreign investors (termed B- or H-shares).<sup>7</sup> (5) I eliminate firm-years that fail to meet my criteria for at least 1 year. (6) I exclude firm-years if the data required to measure firm-specific control variables are unavailable. Finally, I obtain a sample of 10,363 firm-year observations which consist of 1,557 unique firms. I winsorize the top and bottom 1 % of each variable to control the influence of some extreme observations.<sup>8</sup>

Panel B of Table 1 reports sample distribution by year and industry. As shown in Panel B, year or industry cluster is not severe in my study. Moreover, Fig. 1a presents a map of the locations of religious sites (i.e., Buddhist monasteries and Taoist temples on the whole) in China, and Fig. 1b, c provides maps of Buddhist monasteries and Taoist temples in China, respectively. The number of Buddhist monasteries and/or Taoist temples is provided in parentheses under province name.

The data sources are as follows. (1) The data of RELIGION are based on my manual collection and calculation. Following a well-known equation from GIS, I fix the longitude and latitude of every Buddhist monastery (Taoist temple) and every firm-year's registered address using "Google-earth", respectively, and then calculate the distance between a listed firm and a monastery (temple). Finally, I determine the distance criterion or the upper limit (i.e., 100/200/300 km) and calculate the number of religious sites within a radius of certain distance around a listed firm's registered address as the proxy for firm-level religious variables (religion intensity). (2) The data of MKT are from the index constructed by Fan et al. (2010), which update annually. (3) The data of BIG10 are from the official website of the Chinese Institute of Certified Public Accountants ([www.cicpa.org.cn](http://www.cicpa.org.cn)), which publicly issue accounting firm's annual rankings. (4) Moreover, other data except for RELIGION, MKT, and BIG10 are all collected and calculated from CSMAR (China Stock Market and Accounting Research), which is frequently used database in extant China studies.

### Descriptive Statistics and Pearson Correlation Analysis

Table 2 reports descriptive statistics of the variables used in this study. As shown in Table 2, expense ratio (ER) and

<sup>3</sup> Note that I also tighten and relax the upper limit and adopt other criteria in 20 km and 50 km apart (e.g., 120, 140, 150, 160, 180, 220, 240, 250, 260, 280) and use the same procedure to define corresponding religious variables for robustness checks.

<sup>4</sup> In addition, I also use province-level religious variables to conduct robustness checks.

<sup>5</sup> Twenty-two provinces include Heilongjiang, Jilin, Liaoning, Hebei, Henan, Shandong, Jiangsu, Shanxi, Shaanxi, Gansu, Sichuan, Qinghai, Hunan, Hubei, Jiangxi, Anhui, Zhejiang, Fujian, Guangdong, Guizhou, Yunnan, and Hainan; Four municipalities include Beijing, Shanghai, Tianjin, and Chongqing; Five autonomous regions of minority nationalities refer to Guangxi Zhuang Autonomous Region, Xizang (Tibet) Autonomous Region, Ningxia Hui Autonomous Region, Inner Mongolia Autonomous Region, and Xinjiang Uygur Autonomous Region.

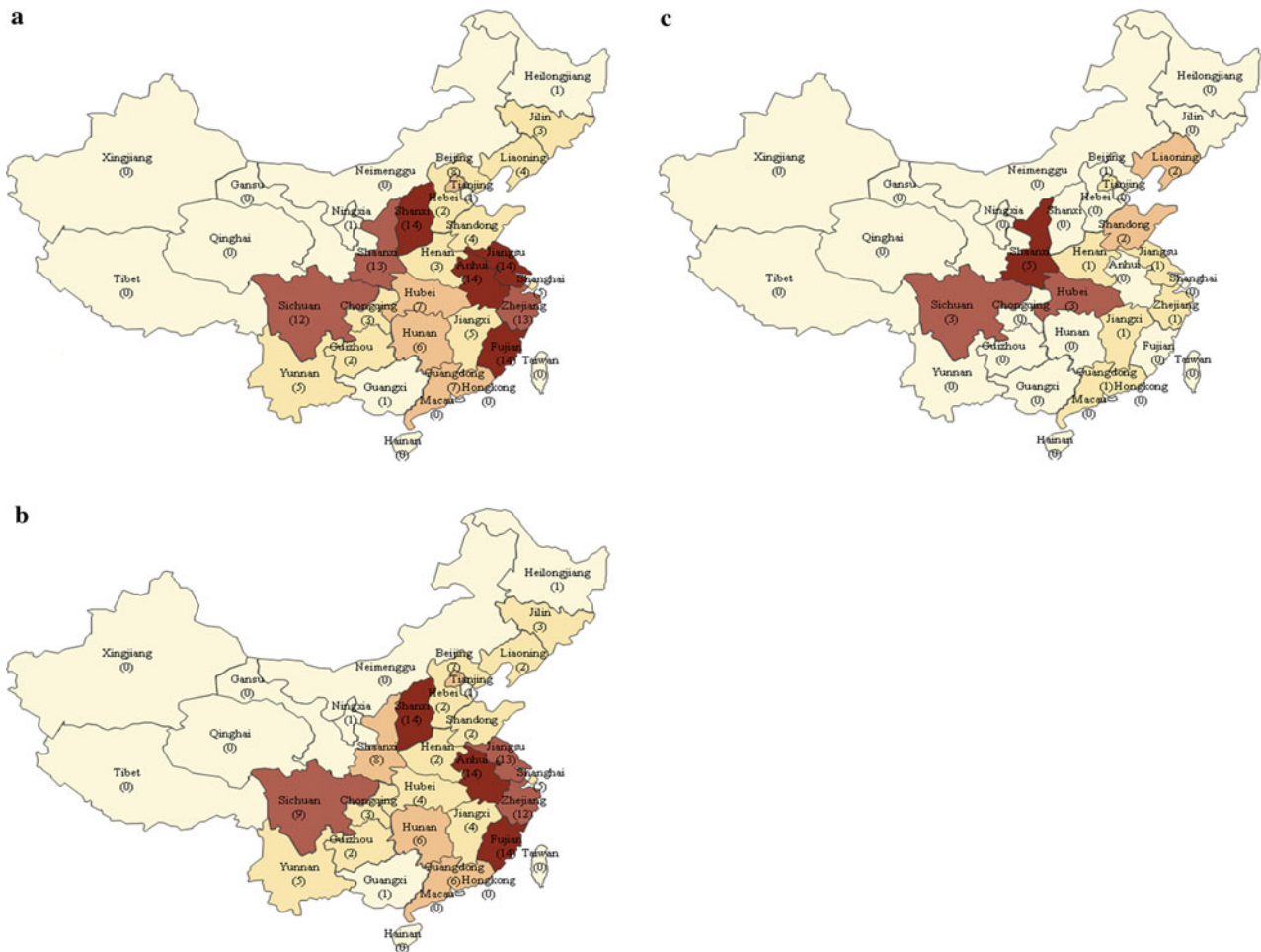
<sup>6</sup> Article 36 of the 1982 Constitution notes clearly that: "Citizens of the People's Republic of China enjoy freedom of religious belief. No state organ, public organization or individual may compel citizens to believe in, or not to believe in, any religion; nor may they discriminate against citizens who believe in, or do not believe in any religion. The state protects normal religious activities".

<sup>7</sup> The results remain qualitatively similar if I introduce the dummy variable of *CROSS* in Eqs. (1) and Eq. (2) to include firm-years that issue shares to foreign investors.

<sup>8</sup> The results are not qualitatively changed by deleting the top and the bottom 1 % of the sample, by no deletion, or by no winsorization.

**Table 1** Sample Selection and sample distribution

Panel A: Firm-years selection												
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Sub-total	%
Initial observations												18,650
Eliminate observations pertaining to the banking, insurance, and other financial industries												(221)
Eliminate observations whose transaction status are ST, *ST, or PT												(1,323)
Eliminate observations whose net assets or shareholders equity are below zero												(49)
Eliminate observations who issue shares to foreign investors (termed B-shares or H-shares)												(1,141)
Eliminate observations who do not meet the criteria that listed for at least 1 year												(988)
Eliminate observations whose data required to measure firm-specific control variables are not available												(4,565)
Available firm-year observations												10,363
Unique firms												1,557
Panel B: sample distribution by year and industry												
Industry	Years											
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Sub-total	%
Agriculture, forestry, husbandry and fishery	18	16	24	24	30	26	28	27	27	24	244	2.36
Mining	7	9	14	16	18	16	19	23	26	26	174	1.68
Food and beverage	27	29	42	43	44	43	46	52	52	47	425	4.10
Textile, garment manufacturing and products of leather and fur	32	33	36	39	45	46	48	52	51	48	430	4.15
Wood and furniture	1	1	2	1	2	3	3	3	5	5	26	0.25
Papermaking and printing	17	17	17	19	22	19	22	26	29	30	218	2.10
Petroleum, chemical, plastics, and rubber products	89	101	117	126	129	122	129	139	148	137	1237	11.94
Electronics	22	23	26	30	36	40	40	57	59	63	396	3.82
Metal and non-metal	71	71	93	100	103	99	98	110	110	108	963	9.29
Machinery, equipment, and instrument manufacturing	111	113	133	141	157	155	158	183	195	206	1552	14.98
Medicine and biological products manufacturing	49	56	65	66	81	82	75	80	77	84	715	6.90
Other manufacturing	10	11	13	12	13	12	14	19	19	21	144	1.39
Production and supply of electricity, steam and tap water	23	27	37	39	44	44	52	53	51	53	423	4.08
Construction	13	13	15	19	22	23	29	32	32	30	228	2.20
Transportation and warehousing	15	19	28	28	30	30	43	44	43	41	321	3.10
Information technology	44	51	58	63	67	59	64	72	77	93	648	6.25
Wholesale and retail	68	69	75	77	80	73	76	76	78	87	759	7.32
Real estate	20	26	44	44	49	49	49	56	60	82	479	4.62
Social services	24	26	30	29	31	30	32	39	40	39	320	3.09
Communication and culture	9	10	9	9	9	8	7	9	10	10	90	0.87
Conglomerates	65	62	60	57	59	55	56	53	54	50	571	5.51
Total by year	735	783	938	982	1,071	1,034	1,088	1,205	1,243	1,284	10,363	
%	7.09	7.56	9.05	9.48	10.33	9.98	10.50	11.63	11.99	12.39		100



**Fig. 1** a A map of the locations of religious sites (Buddhist monasteries and Taoist temples) in China. b A map of the locations of Buddhist monasteries in China. c A map of the locations of Taoist temples in China. *Notes:* In Figs. 1a–c, I use *different colors* to denote the number of religious sites. In particular, in a (i.e., Buddhist monasteries and Taoist temples on the whole), the *color* and the *number* of religious sites display the following one-to-one relationship: *light yellow* [0, 2), *yellow* [2, 6), *dark yellow* [6, 9), *light brown* [9, 14), *dark brown* [14, +∞). In b (i.e., Buddhist monasteries), the *color* and the *number* of religious sites display the following one-to-one relationship: *light yellow* [0, 2), *yellow* [2, 6), *dark yellow* [6, 9), *light brown* [9, 14), *dark brown* [14, +∞). In c (i.e., Taoist temples), the *color* and the *number* of religious sites display the following one-to-one relationship: *light yellow* [0, 1), *yellow* [1, 2), *dark yellow* [2, 3), *light brown* [3, 5), *dark brown*: [5, +∞)

asset utilization ratio (AUR) are reasonably distributed with mean (median) of 15.94 % (11.88 %) and 72.08 % (58.86 %), respectively. These results are qualitatively similar to those in Dang and Fang (2011).

Next, I turn to report descriptive statistics of the main independent variable (i.e., RELIGION) and external monitoring mechanism variables (i.e., BIG10 and MKT). The mean values of RELIGION100, RELIGION200, and RELIGION300 are 3.8260, 9.0432, and 15.9855, respectively. These results provide the number of Buddhist monasteries and/or Taoist temples located in the radius of 100 km, 200 km, 300 km, respectively, around a listed firm’s registered address, and then measure religious intensity based on different distance criteria. The variable of MKT has a mean value of 7.9452 with a standard deviation of 2.2166, suggesting that the extent of

[9, 14), *dark brown* [14, +∞). In b (i.e., Buddhist monasteries), the *color* and the *number* of religious sites display the following one-to-one relationship: *light yellow* [0, 2), *yellow* [2, 6), *dark yellow* [6, 9), *light brown* [9, 14), *dark brown* [14, +∞). In c (i.e., Taoist temples), the *color* and the *number* of religious sites display the following one-to-one relationship: *light yellow* [0, 1), *yellow* [1, 2), *dark yellow* [2, 3), *light brown* [3, 5), *dark brown*: [5, +∞)

Marketization for firm-years during my sample period is very different. The mean value of BIG10 is 0.2754, meaning that 27.54 % of firm-years hired one of BIG10 auditors in the Chinese audit market to audit their annual reports. This percentage is far less than those in developed markets and other emerging markets.<sup>9</sup>

With reference to the descriptive statistics of control variables, most are reasonably distributed. The FIRST

<sup>9</sup> In fact, the Chinese audit market is highly competitive and high quality auditors own a relatively lower market shares. For example, the market share of the Big 4 (in listed firms) in China from 2003 to 2008 was 17, 21, 25, 28, 33, and 33 %, respectively. However, according to Choi and Wong (2007), the market share of the Big 5 is 79.61 % in Australia, 90.98 % in Denmark, 82.05 % in Finland, 87.02 % in Hong Kong, 57.96 % in Taiwan, 62.13 % in Thailand, and 95.79 % in the United States.

**Table 2** Descriptive statistics

Variables	<i>N</i>	Mean	SD	MIN	Q1	Median	Q3	MAX
ER	10,363	0.1594	0.1696	0.0111	0.0727	0.1188	0.1871	2.6948
AUR	10,363	0.7208	0.5249	0.0352	0.3701	0.5886	0.9046	3.2617
RELIGION100	10,363	3.8260	3.6467	0	1	2	8	12
RELIGION200	10,363	9.0432	7.7002	0	3	6	14	31
RELIGION300	10,363	15.9855	12.7352	0	5	12	24	45
MKT	10,363	7.9452	2.2166	0.79	6.23	7.66	9.76	11.71
BIG10	10,363	0.2754	0.4467	0	0	0	1	1
FIRST	10,363	0.3934	0.1635	0.0745	0.2628	0.3733	0.5183	0.8182
MANSHR	10,363	0.0188	0.0836	0	0	0.0001	0.0003	0.7838
INDR	10,363	0.3232	0.0993	0	0.3333	0.3333	0.3636	0.8000
LNBOARD	10,363	2.2179	0.2154	1.0986	2.1972	2.1972	2.3979	2.9444
DUAL	10,363	0.1328	0.3394	0	0	0	0	1
SIZE	10,363	21.3985	0.9860	19.1673	20.7137	21.2916	21.9757	25.6209
LEV	10,363	0.4853	0.1812	0.0283	0.3556	0.4966	0.6221	0.9938
LISTAGE	10,363	8.3121	4.0366	2	5	8	11	21
STATE	10,363	0.6686	0.4707	0	0	1	1	1

Note: All the variables are defined in Table 11 in [Appendix](#)

variable has a mean (median) value of 0.3934 (0.3733), indicating a centralized ownership characteristic in Chinese listed firms. The mean and median values of MANSHR are 1.88 and 0.01 %, respectively, suggesting that most Chinese listed firms' managers own only a small percentage of stock. The mean (median) value of INDR is about 32.32 % (33.33 %), indicating that the main purpose of importing independent directors in most Chinese listed firms is not to improve corporate governance or protect the interests of minority shareholders, but only to cater to the oversight requirements of China Securities Regulation Committee (CSRC). The variable of LNBOARD has a mean value of 2.2179, revealing that the committee of directors consists of eight persons on average. The mean value of DUAL is 0.1328, suggesting that the CEO and the chairman of the board are the same person for 13.28 % of firm-years. The SIZE variable has a mean (median) of 21.3985 (21.2916), with a standard deviation of 0.9860, meaning a big gap in firm size among my sample firms. The mean (median) of LEV is 48.53 % (49.66 %), suggesting that Chinese listed firms experienced a relatively high financial leverage level during the sample period. The mean (median) of LISTAGE is 8.3121 (8.0000), with a relatively large standard deviation of 4.0366. The mean value of STATE is 0.6686, suggesting that the ultimate owners for 66.86 % of firm-years are central (local) government agencies or central (local) government-controlled state-owned enterprises.

With respect to Pearson correlation analysis of variables presented in Table 3, the following findings are noteworthy. ER (AUR) is significantly negatively (positively) correlated with RELIGION100, RELIGION200, and RELIGION300 at

the 1 % level, providing preliminary support for Hypothesis 1. Moreover, ER (AUR) is significantly negatively (positively) associated with MKT and BIG10 at the 1 % level, meaning that the Marketization extent and high-quality auditors can reduce owner-manager agency costs. Above results, taken together, suggest that the substitution effect may exist between religion and the Marketization extent (high-quality auditors) in reducing agency costs, and thus suggest that my study should examine the joint effects of religion and external monitoring mechanisms on owner-manager agency costs.

Next, I turn to the Pearson correlation between owner-manager agency costs and control variables. I find that ER (AUR) is significantly negatively (positively) correlated with FIRST, INDR, LNBOARD, SIZE, LEV, LISTAGE and STATE. Moreover, ER displays positive correlation with DUAL and MANSHR, and AUR is positively correlated with MANSHR. These results suggest a need to control for these variables when examining the effects of religion on owner-manager agency costs.

Moreover, as expected, the coefficients of pair-wise correlation among other control variables in all models are generally low (<0.40), suggesting no multicollinearity problem when these variables are included together in the regressions.

## Empirical Results

### Multivariate Test of Hypothesis 1

Hypothesis 1 predicts that religion is negatively associated with owner-manager agency costs. Table 4 reports the OLS

**Table 3** Pearson correlation matrix ( $N = 10,363$ )

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
ER	1															
AUR	-0.3054 ( $<0.0001$ )	1														
RELIGION100	-0.0437 ( $<0.0001$ )	0.0570 ( $<0.0001$ )	1													
RELIGION200	-0.0864 ( $<0.0001$ )	0.0939 ( $<0.0001$ )	0.7418 ( $<0.0001$ )	1												
RELIGION300	-0.0888 ( $<0.0001$ )	0.1020 ( $<0.0001$ )	0.6902 ( $<0.0001$ )	0.9228 ( $<0.0001$ )	1											
MKT	-0.1069 ( $<0.0001$ )	0.1531 ( $<0.0001$ )	0.4002 ( $<0.0001$ )	0.4632 ( $<0.0001$ )	0.4916 ( $<0.0001$ )	1										
BIG10	-0.0677 ( $<0.0001$ )	0.0848 ( $<0.0001$ )	0.1804 ( $<0.0001$ )	0.1727 ( $<0.0001$ )	0.1678 ( $<0.0001$ )	0.2296 ( $<0.0001$ )	1									
FIRST	-0.1361 ( $<0.0001$ )	0.0719 ( $<0.0001$ )	0.0059 ( $<0.0001$ )	0.0034 ( $<0.0001$ )	0.0343 ( $<0.0001$ )	-0.1199 ( $<0.0001$ )	0.0467 ( $<0.0001$ )	1								
MANSHR	0.0231 (0.0189)	0.0353 (0.0003)	0.0381 (0.0001)	0.0798 ( $<0.0001$ )	0.0809 (0.0005)	0.0809 ( $<0.0001$ )	0.0394 ( $<0.0001$ )	-0.1207 ( $<0.0001$ )	1							
INDR	-0.0674 ( $<0.0001$ )	0.0923 ( $<0.0001$ )	0.0043 (0.6606)	0.0110 (0.2613)	0.0131 (0.1813)	0.3340 ( $<0.0001$ )	0.1168 ( $<0.0001$ )	-0.1259 ( $<0.0001$ )	0.0993 ( $<0.0001$ )	1						
LNBOARD	-0.0690 ( $<0.0001$ )	0.0460 ( $<0.0001$ )	-0.0205 (0.0366)	-0.0294 (0.0028)	-0.0224 (0.0225)	-0.0769 ( $<0.0001$ )	0.0305 (0.0019)	0.0242 (0.0138)	-0.0730 ( $<0.0001$ )	-0.1304 ( $<0.0001$ )	1					
DUAL	0.0733 ( $<0.0001$ )	-0.0096 (0.3280)	-0.0019 (0.8452)	0.0160 (0.1039)	0.0284 (0.0039)	0.0814 ( $<0.0001$ )	0.0013 (0.8946)	-0.0537 ( $<0.0001$ )	0.1323 ( $<0.0001$ )	0.0343 (0.0005)	-0.0953 ( $<0.0001$ )	1				
SIZE	-0.2856 ( $<0.0001$ )	0.1510 ( $<0.0001$ )	0.0063 (0.5194)	-0.0095 (0.3348)	0.0052 (0.5974)	0.1555 ( $<0.0001$ )	0.2186 ( $<0.0001$ )	0.1989 ( $<0.0001$ )	-0.1191 ( $<0.0001$ )	0.1405 ( $<0.0001$ )	0.1923 ( $<0.0001$ )	-0.0763 ( $<0.0001$ )	1			
LEV	-0.0679 ( $<0.0001$ )	0.1229 ( $<0.0001$ )	-0.0312 (0.0015)	-0.0143 (0.1469)	-0.0121 (0.2170)	0.0145 (0.1410)	0.0230 (0.0192)	-0.0602 ( $<0.0001$ )	-0.1175 ( $<0.0001$ )	0.0771 ( $<0.0001$ )	0.0569 ( $<0.0001$ )	-0.0549 ( $<0.0001$ )	0.3296 ( $<0.0001$ )	1		
LISTAGE	-0.0269 (0.0062)	0.0406 ( $<0.0001$ )	0.0667 ( $<0.0001$ )	0.0225 (0.0218)	0.0024 (0.8053)	0.2263 ( $<0.0001$ )	0.0862 ( $<0.0001$ )	-0.2254 ( $<0.0001$ )	-0.2673 ( $<0.0001$ )	0.2306 ( $<0.0001$ )	-0.0723 ( $<0.0001$ )	-0.0663 ( $<0.0001$ )	0.2268 ( $<0.0001$ )	0.2122 ( $<0.0001$ )	1	
STATE	-0.0859 ( $<0.0001$ )	0.0507 ( $<0.0001$ )	-0.0526 ( $<0.0001$ )	-0.0805 ( $<0.0001$ )	-0.0712 ( $<0.0001$ )	-0.2048 ( $<0.0001$ )	0.0132 (0.1795)	0.2712 ( $<0.0001$ )	-0.2961 ( $<0.0001$ )	-0.1538 ( $<0.0001$ )	0.1825 ( $<0.0001$ )	-0.1335 ( $<0.0001$ )	0.1866 ( $<0.0001$ )	0.0416 ( $<0.0001$ )	0.0668 ( $<0.0001$ )	1

Note: *P* value is presented in parentheses. All the variables are defined in Table 11 in [Appendix](#)

**Table 4** Results of owner-manager agency costs on religion and other determinations

Variable	Dependent variable: expense ratio			Dependent variable: asset utilization ratio		
	(1) Coefficient ( <i>t</i> value)	(2) Coefficient ( <i>t</i> value)	(3) Coefficient ( <i>t</i> value)	(4) Coefficient ( <i>t</i> value)	(5) Coefficient ( <i>t</i> value)	(6) Coefficient ( <i>t</i> value)
RELIGION100	−0.0027*** (−3.72)			0.0076** (2.32)		
RELIGION200		−0.0019*** (−5.61)			0.0046*** (2.87)	
RELIGION300			−0.0011*** (−5.67)			0.0029*** (3.12)
FIRST	−0.0822*** (−4.88)	−0.0801*** (−4.75)	−0.0779*** (−4.60)	0.2962*** (4.09)	0.2929*** (4.03)	0.2859*** (3.93)
MANSHR	0.0077 (0.22)	0.0146 (0.43)	0.0137 (0.40)	0.2821*** (2.59)	0.2674** (2.45)	0.2675** (2.46)
INDR	−0.0333 (−0.76)	−0.0353 (−0.81)	−0.0350 (−0.80)	0.0702 (0.63)	0.0758 (0.68)	0.0751 (0.67)
LNBOARD	−0.0212 (−1.61)	−0.0215 (−1.64)	−0.0210 (−1.60)	0.0929** (2.01)	0.0936** (2.02)	0.0925** (2.00)
DUAL	0.0225*** (2.92)	0.0228*** (3.00)	0.0233*** (3.06)	0.0012 (0.05)	0.0004 (0.02)	−0.0010 (−0.04)
SIZE	−0.0388*** (−11.00)	−0.0389*** (−11.00)	−0.0387*** (−11.02)	0.0544*** (3.74)	0.0547*** (3.76)	0.0543*** (3.72)
LEV	0.0344* (1.75)	0.0359* (1.84)	0.0364* (1.86)	0.2314*** (3.20)	0.2265*** (3.14)	0.2255*** (3.13)
LISTAGE	0.0022*** (2.74)	0.0021*** (2.68)	0.0020** (2.57)	−0.0034 (−1.05)	−0.0031 (−0.98)	−0.0029 (−0.92)
STATE	−0.0100 (−1.50)	−0.0107 (−1.61)	−0.0105 (−1.58)	0.0503** (2.07)	0.0517** (2.11)	0.0514** (2.11)
INTERCEPT	1.1130*** (14.86)	1.1182*** (14.94)	1.1138*** (14.96)	−1.2047*** (−4.25)	−1.2186*** (−4.29)	−1.2073*** (−4.25)
INDUSTRY	YES	YES	YES	YES	YES	YES
YEAR	YES	YES	YES	YES	YES	YES
Adj_ <i>R</i> <sup>2</sup>	16.88 %	17.27 %	17.24 %	22.31 %	22.48 %	22.53 %
Num of Obs.	10,363	10,363	10,363	10,363	10,363	10,363
<i>F</i> ( <i>p</i> value)	54.98*** (<0.0001)	56.45*** (<0.0001)	56.35*** (<0.0001)	77.31*** (<0.0001)	78.05*** (<0.0001)	78.28*** (<0.0001)

Notes: \*\*\* 1 %, \*\* 5 %, and \* 10 % levels of significance, respectively, for a two-tailed tests. All reported *t* statistics are based on standard errors adjusted for clustering at the firm level. All the variables are defined in Table 11 in [Appendix](#)

regression results of owner-manager agency costs on religion and other determinations. To address a concern over potential serial correlation problems associated with unbalanced panel data, I compute and report all *t* values using robust standard errors adjusted for clustering at the firm level.<sup>10</sup>

As shown in Columns (1)–(3) of Table 4, the coefficients on RELIGION100, RELIGION200, and RELIGION300 are all negative and significant at the 1 % level (−0.0027 with *t* = −3.72, −0.0019 with *t* = −5.61, and −0.0011 with *t* = −5.67, respectively), suggesting that religion *does* matter to and reduce expense ratio. This

<sup>10</sup> Because the time period is relatively short and my sample comprises cross-sectional data, the robust method of Newey and West (1987) and White (1980) will underestimate systematically standard errors and overestimate the significance of coefficient. Petersen (2009) argues that for data with a shorter period and many cross-

Footnote 10 continued  
sectional observations, it is suitable to directly adjust standard errors for clustering. It is worthy noting that the significances of all variables in Tables 4, 5, 6, 7, 8, 9, and 10 will be *greatly improved* if I adopt White (1980) or Newey and West (1987) method.

result is consistent with Hypothesis 1 and provides support for the following view: Religion can curb managers' unethical behavior,<sup>11</sup> upgrade the efficiency of managers' control operating costs, and thus lower expense ratio and reduce owner-manager agency costs. It is worth noting that the absolute magnitude of the coefficients on RELIGION100, RELIGION200, and RELIGION300 declines when the distance criterion to measure religious variables is defined more expansively.<sup>12</sup>

Next, I turn to control variables in Columns (1)–(3). The coefficients on FIRST are all negative and significant at the 1 % level, suggesting that higher percentage of shares can encourage controlling shareholders to monitor managers, alleviate agency conflicts between management and shareholders, and thereof lower expense ratio. The variable of DUAL has a significantly positive sign at the 1 % level in all cases of Columns (1)–(3), indicating that higher management power lead to more managers' unethical behavior (e.g., excessive perquisite consumption), and thus increases expense ratio. The coefficients on SIZE are all negative and significant at the 1 % level, meaning a significantly lower expense ratio for larger firms. The coefficients on LEV in Columns (1)–(3) are all significantly positive at the 10 % level, meaning that financial leverage is significantly positively associated with expense ratio. The signs of LISTAGE are all positive and significant at the 1 or 5 % level, suggesting that a firm's listed age is significantly positively related to expense ratio.

In Columns (4)–(6), the coefficient on RELIGION100, RELIGION200, and RELIGION300 are all positive and significant at the 5 or 1 % level (0.0076 with  $t = 2.32$ , 0.0046 with  $t = 2.87$ , and 0.0029 with  $t = 3.12$ , respectively), suggesting that religion can alleviate ethical tensions between management and shareholders, upgrade the efficiency of managers' deploying assets, and thereof increase asset utilization ratio and reduce owner-manager agency costs. This result lends further support to Hypothesis 1. Similarly, I also find that the magnitude of the coefficients on RELIGION100, RELIGION200, and RELIGION300 declines when the distance criterion to measure religious variables is defined more expansively.

With reference to the signs and significances of control variables in Columns (4)–(6) of Table 4, it is noteworthy the followings. The coefficients on FIRST are all positive and significant at the 1 % level, meaning that higher ownership percentage provide incentives for controlling shareholders to restrain managers' unethical behavior and

increase asset utilization efficiency. The variable of MANSHR has a significantly positive sign in all cases, suggesting that higher percentage of common stock owned by managers lubricates agency conflicts and increases benefit convergence between management and shareholders, and thus upgrades operational efficiency and increases asset utilization ratio. The coefficients on LNBOARD are all positive and significant at the 5 % level, suggesting that the size of the committee of directors is positively associated with a firm's asset utilization ratio. There is a significantly positive relation between AUR and SIZE in all cases, meaning that larger firms can improve asset utilization efficiency via their influence on the product and markets share. The signs of LEV are all positive and significant at the 1 % level, indicating that higher financial leverage increases asset utilization efficiency because debt can play a role in curbing managers from unethical behavior. The coefficients on STATE are all positive and significant at the 5 % level, meaning that state-owned enterprises have significantly higher asset utilization efficiency than do non-state-owned enterprises. In fact, state-owned enterprises always locate in monopoly industries and are supported by Chinese industrial policies, and thus possess monopolized annual sales and a higher asset utilization ratio.

## Multivariate Test of Hypothesis 2

Hypothesis 2 predicts that external monitoring mechanisms attenuate the negative association between religion and owner-manager agency costs. Table 5 reports the OLS regression results.

The dependent variable in Columns (1)–(6) is expense ratio, which is the positive proxy for owner-manager agency costs. As reported in Columns (1)–(3) in which I adopt MKT as the proxy for external monitoring mechanism, the coefficients on RELIGION100, RELIGION200, and RELIGION300 are all negative and significant at the 1 % level with a declined tendency on the absolute magnitude of the coefficients, which is again consistent with Hypothesis 1. Moreover, the variable of MKT has a significantly negative coefficient in all cases of Columns (1)–(3), suggesting that Chinese listed firms located in faster Marketization provinces have lower expense ratio (the positive proxy for owner-manager agency costs). The coefficients on the interaction terms, that is, RELIGION100  $\times$  MKT, RELIGION200  $\times$  MKT, and RELIGION300  $\times$  MKT, are all positive and significant at the 5 or 1 % level (0.0007 with  $t = 2.02$ ; 0.0004 with  $t = 2.51$ , and 0.0003 with  $t = 3.12$ , respectively), suggesting the negative association between religion and expense ratio is attenuated for firms located in faster Marketization regions. These results provide strong and consistent support to Hypothesis 2.

<sup>11</sup> Managers' unethical behaviors include that managers award themselves excessive salaries or spend money lavishly on entertainment, travel, and other perquisites.

<sup>12</sup> I thank one referee for his/her reminding me the tendency on the absolute magnitude of the coefficients on RELIGION100, RELIGION200, and RELIGION300.

**Table 5** Results of owner-manager agency costs on religion, external monitoring mechanisms and other determinations

Variable	Dependent variable: expense ratio				Dependent variable: asset utilization ratio							
	(1) Coefficient ( <i>t</i> value)	(2) Coefficient ( <i>t</i> value)	(3) Coefficient ( <i>t</i> value)	(4) Coefficient ( <i>t</i> value)	(5) Coefficient ( <i>t</i> value)	(6) Coefficient ( <i>t</i> value)	(7) Coefficient ( <i>t</i> value)	(8) Coefficient ( <i>t</i> value)	(9) Coefficient ( <i>t</i> value)	(10) Coefficient ( <i>t</i> value)	(11) Coefficient ( <i>t</i> value)	(12) Coefficient ( <i>t</i> value)
RELIGION100	-0.0074*** (-2.59)			-0.0039*** (-4.78)			0.0353*** (3.65)			0.0109*** (3.08)		
RELIGION200		-0.0049*** (-3.73)			-0.0025*** (-6.59)		0.0151*** (2.92)				0.0059*** (3.32)	
RELIGION300			-0.0035*** (-4.20)			-0.0015*** (-6.73)		0.0109*** (3.23)				0.0035*** (3.41)
RELIGIO N100 × MKT	0.0007** (2.02)						-0.0041*** (-3.46)					
RELIGIO N200 × MKT		0.0004** (2.51)					-0.0016*** (-2.74)					
RELIGIO N300 × MKT			0.0003*** (3.12)					-0.0012*** (-3.13)				
RELIGIO N100 × BIG10				0.0003*** (2.61)						-0.0124*** (-2.16)		
RELIGIO N200 × BIG10					0.0018*** (3.39)						-0.0052** (-2.05)	-0.0024 (-1.56)
RELIGIO N300 × BIG10						0.0011*** (3.56)						
MKT	-0.0060*** (-2.92)	-0.0047** (-2.14)	-0.0051** (-2.32)				0.0469*** (5.89)	0.0442*** (5.27)	0.0456*** (5.53)			
BIG10					-0.0076 (-1.25)	-0.0120* (-1.75)				0.0842** (2.38)	0.0790** (2.27)	0.0688* (1.85)
FIRST	-0.0814*** (-4.82)	-0.0789*** (-4.69)	-0.0761*** (-4.52)	-0.0825*** (-4.91)	-0.0803*** (-4.78)	-0.0781*** (-4.63)	0.2864*** (3.97)	0.2770*** (3.85)	0.2720*** (3.78)	0.2906*** (4.02)	0.2870*** (3.94)	0.2813*** (3.86)
MANSHR	0.0182 (0.53)	0.0178 (0.52)	0.0159 (0.46)	0.0077 (0.22)	0.0134 (0.40)	0.0115 (0.34)	0.1901* (1.79)	0.1955* (1.84)	0.1977* (1.86)	0.2783** (2.56)	0.2684** (2.48)	0.2697** (2.49)
INDR	-0.0264 (-0.61)	-0.0305 (-0.71)	-0.0309 (-0.72)	-0.0354 (-0.81)	-0.0375 (-0.86)	-0.0367 (-0.85)	0.0219 (0.20)	0.0391 (0.35)	0.0419 (0.38)	0.0714 (0.64)	0.0751 (0.67)	0.0729 (0.65)
LNBOARD	-0.0208 (-1.60)	-0.0210 (-1.61)	-0.0206 (-1.57)	-0.0218* (-1.67)	-0.0222* (-1.69)	-0.0216 (-1.65)	0.0919** (1.98)	0.0937** (2.03)	0.0940** (2.03)	0.0920** (1.99)	0.0926** (2.00)	0.0912** (1.97)
PLU	0.0234*** (3.05)	0.0232*** (3.06)	0.0236*** (3.09)	0.0222*** (2.90)	0.0228*** (3.01)	0.0232*** (3.06)	-0.0066 (-0.26)	-0.0067 (-0.26)	-0.0065 (-0.26)	0.0022 (0.09)	0.0005 (0.02)	-0.0006 (-0.02)
SIZE	-0.0382*** (-10.80)	-0.0385*** (-10.83)	-0.0383*** (-10.83)	-0.0395*** (-11.39)	-0.0395*** (-11.39)	-0.0393*** (-11.38)	0.0486*** (3.35)	0.0479*** (3.29)	0.0477*** (3.28)	0.0530*** (3.63)	0.0530*** (3.63)	0.0525*** (3.59)
LEV	0.0333* (1.71)	0.0347* (1.78)	0.0354* (1.81)	0.0360* (1.84)	0.0374* (1.92)	0.0382** (1.96)	0.2411*** (3.37)	0.2455*** (3.45)	0.2450*** (3.45)	0.2288*** (3.17)	0.2262*** (3.15)	0.2251*** (3.14)



**Table 5** continued

Variable	Dependent variable: expense ratio					Dependent variable: asset utilization ratio						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Coefficient ( <i>t</i> value)	Coefficient ( <i>t</i> value)	Coefficient ( <i>t</i> value)	Coefficient ( <i>t</i> value)	Coefficient ( <i>t</i> value)	Coefficient ( <i>t</i> value)	Coefficient ( <i>t</i> value)	Coefficient ( <i>t</i> value)	Coefficient ( <i>t</i> value)	Coefficient ( <i>t</i> value)	Coefficient ( <i>t</i> value)	Coefficient ( <i>t</i> value)
LISTAGE	0.0022*** (2.74)	0.0021*** (2.67)	0.0020** (2.54)	0.0022*** (2.74)	0.0021*** (2.64)	0.0020** (2.51)	-0.0035 (-1.11)	-0.0037 (-1.17)	-0.0035 (-1.13)	-0.0030 (-0.94)	-0.0028 (-0.87)	-0.0026 (-0.83)
STATE	-0.0113* (-1.70)	-0.0106 (-1.59)	-0.0102 (-1.53)	-0.0102 (-1.54)	-0.0107 (-1.60)	-0.0105 (-1.57)	0.0616** (2.54)	0.0581** (2.38)	0.0576** (2.36)	0.0491** (2.02)	0.0496** (2.03)	0.0497** (2.03)
INTERCEPT	1.1347*** (15.04)	1.1401*** (15.08)	1.1420*** (15.17)	1.1315*** (15.32)	1.1380*** (15.43)	1.1315*** (15.40)	-1.3430*** (-4.72)	-1.3138*** (-4.60)	-1.3301*** (-4.67)	-1.1836*** (-4.15)	-1.1901*** (-4.17)	-1.1743*** (-4.11)
INDUSTRY	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
YEAR	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Adj_ R <sup>2</sup>	17.08 %	17.39 %	17.42 %	17.01 %	17.44 %	17.41 %	23.63 %	23.54 %	23.61 %	22.49 %	22.62 %	22.62 %
Num. of Obs.	10,363	10,363	10,363	10,363	10,363	10,363	10,363	10,363	10,363	10,363	10,363	10,363
F( <i>p</i> value)	53.04*** (<0.0001)	54.22*** (<0.0001)	54.30*** (<0.0001)	52.79*** (<0.0001)	54.40*** (<0.0001)	54.29*** (<0.0001)	79.18*** (<0.0001)	78.81*** (<0.0001)	79.12*** (<0.0001)	74.35*** (<0.0001)	74.88*** (<0.0001)	74.89*** (<0.0001)

Notes: \*\*\* 1 %, \*\* 5 %, and \* 10 % levels of significance, respectively, for a two-tailed tests. All reported *t* statistics are based on standard errors adjusted for clustering at the firm level. All the variables are defined in Table 11 in Appendix

As shown in Columns (4)–(6) in which I adopt BIG10 as the proxy for external monitoring mechanism, I find that there are significant and negative associations between religious variables (i.e., RELIGION100, RELIGION200, and RELIGION300) and expense ratio, which provides again support to Hypothesis 1. More important, the coefficients on RELIGION100 × BIG10, RELIGION200 × BIG10, and RELIGION300 × BIG10 are all positive and significant at the 1 % level (0.0033 with *t* = 2.61, 0.0018 with *t* = 3.39, and 0.0011 with *t* = 3.56, respectively), indicating that the negative association between religion and expense ratio is attenuated for firms with BIG10 auditor (high-quality auditors). This result is consistent with Hypothesis 2.

The dependent variable in Columns (7)–(12) is asset utilization ratio, which is the reverse proxy for owner-manager agency costs. As presented in Columns (7)–(9) in which I adopt MKT as the proxy for external monitoring mechanism, the coefficients on RELIGION100, RELIGION200, and RELIGION300 are all positive and significant at the 1 % level, which is consistent with Hypothesis 1. Moreover, the coefficients on MKT are all positive and significant at the 1 % level, suggesting that the Marketization extent is significantly positively associated with asset utilization ratio. The coefficient on the interaction terms, that is, RELIGION100 × MKT, RELIGION200 × MKT, and RELIGION300 × MKT, are all negative and significant at the 1 % level (-0.0041 with *t* = -3.46, -0.0016 with *t* = -2.74, and -0.0012 with *t* = -3.13, respectively), meaning that the Marketization extent attenuates the positive association between religion and asset utilization ratio. This result lends strong support to Hypothesis 2.

As reported in Columns (10)–(12) in which BIG10 is the proxy for external monitoring mechanism, I find the coefficients on RELIGION100, RELIGION200, and RELIGION300 are all positive and significant at the 1 % level, which is again consistent with Hypothesis 1. Moreover, the variable of BIG10 has a significantly positive coefficient in all cases of Columns (10)–(12), which support the following view: High-quality auditors can upgrade the quality of accounting information and mitigate agency conflicts between management and shareholders, and thus improve operational efficiency and increase asset utilization ratio. Furthermore, the coefficients on RELIGION100 × BIG10 and RELIGION200 × BIG10 are both negative and significant at the 5 % level (-0.0124 with *t* = -2.16 and -0.0052 with *t* = -2.05), suggesting that high-quality auditors can attenuate the positive association between religion and asset utilization ratio. The coefficient on RELIGION300 × BIG10 is negative and marginally significant at the 12 % level. Above results, overall, are consistent with Hypothesis 2.

As for control variables in Table 5, the signs and significances are qualitatively similar to those in Table 4.

**Table 6** Further tests of H1 for different kinds of religions: Buddhism and Taoism

Variable	Dependent variable: expense ratio			Dependent variable: asset utilization ratio		
	(1) Coefficient ( <i>t</i> value)	(2) Coefficient ( <i>t</i> value)	(3) Coefficient ( <i>t</i> value)	(4) Coefficient ( <i>t</i> value)	(5) Coefficient ( <i>t</i> value)	(6) Coefficient ( <i>t</i> value)
RELIGION100_BM	-0.0031*** (-4.03)			0.0072** (2.08)		
RELIGION100_TAO	0.0050 (1.30)			0.0147 (0.93)		
RELIGION200_BM		-0.0020*** (-5.28)			0.0049*** (2.85)	
RELIGION200_TAO		-0.0003 (-0.11)			-0.0009 (-0.08)	
RELIGION300_BM			-0.0011*** (-5.32)			0.0033*** (3.34)
RELIGION300_TAO			-0.0013 (-0.63)			-0.0072 (-0.98)
FIRST	-0.0831*** (-4.96)	-0.0800*** (-4.74)	-0.0779*** (-4.60)	0.2954*** (4.08)	0.2923*** (4.02)	0.2842*** (3.90)
MANSHR	0.0067 (0.20)	0.0149 (0.44)	0.0136 (0.40)	0.2812*** (2.58)	0.2666** (2.44)	0.2642** (2.42)
INDR	-0.0352 (-0.80)	-0.0363 (-0.83)	-0.0348 (-0.80)	0.0685 (0.61)	0.0793 (0.71)	0.0836 (0.75)
LNBOARD	-0.0212 (-1.62)	-0.0216* (-1.65)	-0.0210 (-1.60)	0.0928** (2.01)	0.0940** (2.03)	0.0921** (1.99)
DUAL	0.0224*** (2.92)	0.0227*** (2.99)	0.0233*** (3.06)	0.0011 (0.04)	0.0005 (0.02)	-0.0011 (-0.04)
SIZE	-0.0385*** (-10.97)	-0.0388*** (-10.99)	-0.0387*** (-11.00)	0.0546*** (3.75)	0.0545*** (3.74)	0.0538*** (3.69)
LEV	0.0336* (1.71)	0.0360* (1.84)	0.0364* (1.86)	0.2306*** (3.18)	0.2261*** (3.14)	0.2250*** (3.12)
LISTAGE	0.0022*** (2.77)	0.0021*** (2.67)	0.0020*** (2.57)	-0.0034 (-1.04)	-0.0031 (-0.97)	-0.0028 (-0.89)
STATE	-0.0096 (-1.45)	-0.0107 (-1.60)	-0.0105 (-1.58)	0.0507** (2.09)	0.0515** (2.11)	0.0519** (2.12)
INTERCEPT	1.1051*** (14.85)	1.1162*** (14.93)	1.1142*** (14.93)	-1.2121*** (-4.26)	-1.2116*** (-4.27)	-1.1888*** (-4.19)
INDUSTRY	YES	YES	YES	YES	YES	YES
YEAR	YES	YES	YES	YES	YES	YES
Adj_R <sup>2</sup>	16.97 %	17.27 %	17.23 %	22.31 %	22.48 %	22.57 %
Number of Obs.	10,363	10,363	10,363	10,363	10,363	10,363
F( <i>p</i> value)	53.96*** ( $< 0.0001$ )	55.06*** ( $< 0.0001$ )	54.94*** ( $< 0.0001$ )	75.40*** ( $< 0.0001$ )	76.13*** ( $< 0.0001$ )	76.53*** ( $< 0.0001$ )

Notes: \*\*\* 1 %, \*\* 5 %, and \* 10 % levels of significance, respectively, for a two-tailed tests. All reported *t* statistics are based on standard errors adjusted for clustering at the firm level. All the variables are defined in Table 11 in [Appendix](#)

### Further Tests of Hypotheses 1 and 2 with Distinction Between Buddhism and Taoism

To address the concern about whether different religions (Buddhism and Taoism in my study) have asymmetric

influences on owner-manager agency costs, I distinguish Buddhism from Taoism and re-estimate Eqs. (1) and (2). Regression results are presented in Tables 6 and 7.

Table 6 presents further tests results of Hypothesis 1. In Columns (1)–(3), the dependent variable is expense ratio,

**Table 7** Further tests of H2 for different kinds of religions: Buddhism and Taoism

Variable	Dependent variable: expense ratio						Dependent variable: asset utilization ratio					
	(1) Coefficient ( <i>t</i> value)	(2) Coefficient ( <i>t</i> value)	(3) Coefficient ( <i>t</i> value)	(4) Coefficient ( <i>t</i> value)	(5) Coefficient ( <i>t</i> value)	(6) Coefficient ( <i>t</i> value)	(7) Coefficient ( <i>t</i> value)	(8) Coefficient ( <i>t</i> value)	(9) Coefficient ( <i>t</i> value)	(10) Coefficient ( <i>t</i> value)	(11) Coefficient ( <i>t</i> value)	(12) Coefficient ( <i>t</i> value)
RELIGION100_BM	-0.0125*** (-3.70)			-0.0048*** (-5.43)			0.0415*** (3.53)			0.0101*** (2.65)		
RELIGION100_TAO	0.0046 (0.29)			0.0086* (1.82)			-0.0170 (-0.35)			0.0218 (1.22)		
RELIGION200_BM		-0.0049*** (-3.43)			-0.0027*** (-6.38)		0.0163*** (2.64)				0.0061*** (3.18)	
RELIGION200_TAO		-0.0111 (-1.12)			0.0014 (0.42)		0.0152 (0.45)				0.0032 (0.29)	
RELIGION300_BM			-0.0033*** (-3.61)			-0.0015*** (-6.34)		0.0108*** (2.78)				0.0036*** (3.33)
RELIGION300_TAO			-0.0082 (-0.94)			-0.0011 (-0.46)		0.0261 (0.83)				0.0003 (0.03)
RELIGION100_BM × MKT	0.0012*** (3.19)						-0.0047*** (-3.52)					
RELIGION100_TAO × MKT	0.0006 (0.30)						0.0021 (0.32)					
RELIGION200_BM × MKT		0.0003** (2.10)					-0.0017** (-2.47)					
RELIGION200_TAO × MKT		0.0018 (1.26)					-0.0031 (-0.52)		-0.0011** (-2.41)			
RELIGION300_BM × MKT			0.0002** (2.43)					-0.0055 (-0.93)				
RELIGION300_TAO × MKT			0.0012 (0.84)									
RELIGION100_BM × BIG10				0.0043*** (3.20)						-0.0113* (-1.89)		
RELIGION100_TAO × BIG10				-0.0098 (-1.45)						-0.0328 (-1.34)		
RELIGION200_BM × BIG10					0.0022*** (3.55)						-0.0046* (-1.66)	
RELIGION200_TAO × BIG10					-0.0053 (-1.02)						-0.0199 (-1.29)	
RELIGION300_BM × BIG10						0.0012*** (3.42)						-0.0016 (-1.02)
RELIGION300_TAO × BIG10						-0.0008 (-0.21)						-0.0289*** (-2.69)

Table 7 continued

Variable	Dependent variable: expense ratio						Dependent variable: asset utilization ratio					
	(1) Coefficient (t value)	(2) Coefficient (t value)	(3) Coefficient (t value)	(4) Coefficient (t value)	(5) Coefficient (t value)	(6) Coefficient (t value)	(7) Coefficient (t value)	(8) Coefficient (t value)	(9) Coefficient (t value)	(10) Coefficient (t value)	(11) Coefficient (t value)	(12) Coefficient (t value)
MKT	-0.0070*** (-3.32)	-0.0057** (-2.45)	-0.0058** (-2.34)	-0.0044 (-0.72)	-0.0061 (-0.87)	-0.0101 (-1.33)	0.0456*** (5.47)	0.0455*** (4.74)	0.0489*** (4.91)	0.0897** (2.44)	0.0885** (2.51)	0.0955** (2.43)
BIG10	-0.0836*** (-4.98)	-0.0793*** (-4.72)	-0.0766*** (-4.55)	-0.0835*** (-5.01)	-0.0802*** (-4.77)	-0.0783*** (-4.64)	0.2846*** (3.94)	0.2767*** (3.84)	0.2727*** (3.79)	0.2901*** (4.01)	0.2859*** (3.93)	0.2772*** (3.80)
MANSHR	0.0157 (0.46)	0.0176 (0.51)	0.0163 (0.47)	0.0075 (0.22)	0.0140 (0.41)	0.0114 (0.34)	0.1866* (1.77)	0.1958* (1.84)	0.1958* (1.84)	0.2790** (2.57)	0.2680** (2.47)	0.2661** (2.45)
INDR	-0.0261 (-0.60)	-0.0310 (-0.72)	-0.0308 (-0.71)	-0.0384 (-0.88)	-0.0384 (-0.89)	-0.0364 (-0.84)	0.0244 (0.22)	0.0429 (0.39)	0.0473 (0.43)	0.0690 (0.62)	0.0801 (0.72)	0.0832 (0.75)
LNBOARD	-0.0202 (-1.56)	-0.0211 (-1.62)	-0.0206 (-1.57)	-0.0221* (-1.70)	-0.0224* (-1.71)	-0.0217* (-1.65)	0.0910* (1.96)	0.0940** (2.03)	0.0932*** (2.02)	0.0916** (1.98)	0.0929** (2.01)	0.0898* (1.94)
PLU	0.0233*** (3.05)	0.0228*** (3.02)	0.0234*** (3.08)	0.0224*** (2.93)	0.0229*** (3.02)	0.0233*** (3.06)	-0.0073 (-0.29)	-0.0061 (-0.24)	-0.0059 (-0.23)	0.0026 (0.10)	0.0010 (0.04)	-0.0005 (-0.02)
SIZE	-0.0380*** (-10.80)	-0.0383*** (-10.80)	-0.0383*** (-10.80)	-0.0393*** (-11.43)	-0.0396*** (-11.42)	-0.0394*** (-11.39)	0.0485*** (3.33)	0.0475*** (3.26)	0.0472*** (3.25)	0.0531*** (3.62)	0.0524*** (3.58)	0.0515*** (3.52)
LEV	0.0331* (1.69)	0.0348* (1.79)	0.0353* (1.81)	0.0357* (1.82)	0.0377* (1.94)	0.0383** (1.97)	0.2402*** (3.36)	0.2450*** (3.44)	0.2444*** (3.44)	0.2291*** (3.17)	0.2262*** (3.15)	0.2256*** (3.15)
LISTAGE	0.0022*** (2.71)	0.0021*** (2.64)	0.0020** (2.51)	0.0022*** (2.76)	0.0020*** (2.62)	0.0020** (2.52)	-0.0034 (-1.07)	-0.0036 (-1.14)	-0.0033 (-1.07)	-0.0031 (-0.94)	-0.0028 (-0.86)	-0.0025 (-0.78)
STATE	-0.0106 (-1.60)	-0.0102 (-1.53)	-0.0102 (-1.53)	-0.0094 (-1.42)	-0.0104 (-1.57)	-0.0104 (-1.56)	0.0611** (2.53)	0.0573** (2.35)	0.0576** (2.36)	0.0499** (2.06)	0.0497** (2.03)	0.0510** (2.08)
INTERCEPT	1.1356*** (15.12)	1.1427*** (15.10)	1.1449*** (15.26)	1.1251*** (15.37)	1.1369*** (15.44)	1.1322*** (15.38)	-1.3304*** (-4.73)	-1.3135*** (-4.60)	-1.3361*** (-4.68)	-1.1868*** (-4.14)	-1.1788*** (-4.13)	-1.1499*** (-4.04)
INDUSTRY	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
YEAR	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Adj_R <sup>2</sup>	17.26 %	17.42 %	17.41 %	17.18 %	17.46 %	17.40 %	23.64 %	23.55 %	23.67 %	22.50 %	22.63 %	22.73 %
Num of Obs.	10,363	10,363	10,363	10,363	10,363	10,363	10,363	10,363	10,363	10,363	10,363	10,363
F(p value)	51.26*** (<0.0001)	51.85*** (<0.0001)	51.80*** (<0.0001)	50.98*** (<0.0001)	51.99*** (<0.0001)	51.77*** (<0.0001)	75.60*** (<0.0001)	75.23*** (<0.0001)	75.71*** (<0.0001)	70.95*** (<0.0001)	71.48*** (<0.0001)	71.89*** (<0.0001)

Notes: \*\*\* 1 %, \*\* 5 %, and \* 10 % levels of significance, respectively, for a two-tailed tests. All reported t statistics are based on standard errors adjusted for clustering at the firm level. All the variables are defined in Table 11 in Appendix

**Table 8** Robustness checks using province-level religious variables

Variable	Dependent variable: expense ratio		Dependent variable: asset utilization ratio	
	(1) Coefficient ( <i>t</i> value)	(2) Coefficient ( <i>t</i> value)	(3) Coefficient ( <i>t</i> value)	(4) Coefficient ( <i>t</i> value)
RELIGION_PRO_NUM	−0.0062*** (−4.76)		0.0073*** (2.75)	
RELIGION_PRO_PER		−0.1630*** (−2.89)		0.2696** (2.37)
FIRST	−0.0846*** (−4.61)	−0.0897*** (−4.88)	0.1101*** (2.97)	0.1167*** (3.15)
MANSHR	−0.0715** (−2.28)	−0.0681** (−2.17)	0.0954 (1.51)	0.0908 (1.43)
INDR	−0.0422* (−1.67)	−0.0407 (−1.62)	0.0950* (1.87)	0.0929* (1.83)
LNBOARD	−0.0198** (−2.08)	−0.0210** (−2.20)	0.0231 (1.20)	0.0240 (1.24)
PLU	−0.0014 (−0.27)	−0.0014 (−0.26)	0.0059 (0.56)	0.0057 (0.54)
SIZE	−0.0464*** (−12.21)	−0.0466*** (−12.25)	−0.0574*** (−7.49)	−0.0571*** (−7.45)
LEV	0.1505*** (11.22)	0.1507*** (11.22)	0.0379 (1.40)	0.0372 (1.38)
LISTAGE	−0.0052 (−1.07)	−0.0061 (−1.26)	0.0774*** (7.94)	0.0790*** (8.08)
STATE	0.0098* (1.72)	0.0107* (1.87)	−0.0004 (−0.04)	−0.0009 (−0.08)
Intercept	1.2995*** (12.41)	1.2995*** (12.38)	1.3450*** (6.36)	1.3339*** (6.30)
INDUSTRY	YES	YES	YES	YES
YEAR	YES	YES	YES	YES
Adj_ <i>R</i> <sup>2</sup>	61.33 %	61.27 %	83.57 %	83.56 %
Number of Obs.	10, 363	10, 363	10, 363	10, 363
<i>F</i> ( <i>p</i> value)	8.85*** (<0.0001)	8.83*** (<.0001)	28.39*** (<0.0001)	28.38*** (<0.0001)

Notes: \*\*\* 1 %, \*\* 5 %, and \* 10 % levels of significance, respectively, for a two-tailed tests. All reported *t* statistics are based on standard errors adjusted for clustering at the firm level. All the variables are defined in Table 11 in [Appendix](#)

the positive proxy for owner-manager agency costs. As reported in Columns (1)–(3), the coefficients on RELIGION100\_BM, RELIGION200\_BM, and RELIGION300\_BM are all negative and significant at the 1 % level (−0.0031 with *t* = −4.03, −0.0020 with *t* = −5.28, and −0.0011 with *t* = −5.32, respectively) with the declined tendency on the absolute magnitude of these coefficients, suggesting that Buddhism can mitigate agency conflicts between management and shareholders, and thus reduces expense ratio. However, I find no significant influence of Taoism on expense ratio in all cases of Columns (1)–(3).

In Columns (4)–(6) in Table 6, the dependent variable is asset utilization ratio, the inverse proxy for owner-manager agency costs. As reported in Columns (4)–(6), the

coefficients on RELIGION100\_BM, RELIGION200\_BM, and RELIGION300\_BM are all positive and significant at the 5 or 1 % level (0.0072 with *t* = 2.08, 0.0049 with *t* = 2.85, and 0.0033 with *t* = 3.34, respectively) with the declined tendency on the magnitude of these coefficients, meaning that Buddhism *does* matter to and increase asset utilization ratio. However, I find no significant influence of Taoism on asset utilization ratio in all cases of Columns (4)–(6).

Above results, taken together, suggest that only for the case of Buddhism, Hypotheses 1 is supported. In other words, only Buddhism matters to and reduces agency costs between management and shareholders, but Taoism has no significant influence on owner-manager agency costs.

**Table 9** Robustness checks of owner-manager agency costs on religion and other determinations

Variable	Dependent variable: expense ratio			Dependent variable: asset utilization ratio		
	(1) Coefficient ( <i>t</i> value)	(2) Coefficient ( <i>t</i> value)	(3) Coefficient ( <i>t</i> value)	(4) Coefficient ( <i>t</i> value)	(5) Coefficient ( <i>t</i> value)	(6) Coefficient ( <i>t</i> value)
Panel A: Robustness checks using firm-year observations that had existed before my sample period (2001–2010)						
RELIGION100	−0.0027*** (−5.50)			0.0041*** (2.76)		
RELIGION200		−0.0020*** (−8.58)			0.0028*** (3.66)	
RELIGION300			−0.0012*** (−8.51)			0.0022*** (4.86)
Adj_ <i>R</i> <sup>2</sup>	15.84 %	16.22 %	16.18 %	22.72 %	22.79 %	22.89 %
Number of Obs.	8, 062	8, 062	8, 062	8, 062	8, 062	8, 062
Panel B: Robustness checks using reduced industries' firm-year observations						
RELIGION100	−0.0044*** (−5.50)			0.0156*** (5.50)		
RELIGION200		−0.0026*** (−6.64)			0.0062*** (4.54)	
RELIGION300			−0.0013*** (−5.65)			0.0039*** (4.93)
Adj_ <i>R</i> <sup>2</sup>	13.19 %	13.60 %	13.26 %	31.73 %	31.54 %	31.58 %
Number of Obs.	3124	3124	3124	3124	3124	3124

Notes: Year dummies, industry dummies and control variables are included in all regression models but not reported here for brevity. \*\*\* 1 %, \*\* 5 %, and \* 10 % levels of significance, respectively, for a two-tailed tests. All reported *t* statistics are based on standard errors adjusted for clustering at the firm level. All the variables are defined in Table 11 in [Appendix](#)

Table 7 presents further tests results of Hypothesis 2. The dependent variables are expense ratio and asset utilization ratio in Columns (1)–(6) and in Columns (7)–(12), respectively.

As reported in Columns (1)–(3), the coefficients on RELIGION100\_BM × MKT, RELIGION200\_BM × MKT, and RELIGION300\_BM × MKT are all positive and significant at the 1 or 5 % level. Moreover, as shown in Columns (4)–(6), the coefficients on RELIGION100\_BM × BIG10, RELIGION200\_BM × BIG10, and RELIGION300\_BM × BIG10 are all positive and significant at the 1 % level. However, the coefficients on these interaction items between religion and Taoism in all cases of Columns (1)–(6) are insignificant.

As shown in Columns (7)–(9) of Table 7, the coefficients on RELIGION100\_BM × MKT, RELIGION200\_BM × MKT, and RELIGION300\_BM × MKT are all negative and significant at the 1 or 5 % level. Moreover, results in Columns (10)–(12) reveal that the coefficients on RELIGION100\_BM × BIG10 and RELIGION200\_BM × BIG10 are negative and significant at the 10 % level, and the coefficient on RELIGION300\_BM × BIG10 is negative and insignificant. However, I find that the coefficients on interaction items between religion and Taoism in all cases

of Columns (7)–(12) are insignificant except for the case of RELIGION300\_BM × BIG10 which is negative and significant.

Above results, taken together, suggest that Hypothesis 2 is supported only for the case of Buddhism on the whole. That is, only for the case of Buddhism, the substitutive effect between religion and external monitoring mechanisms on owner-manager agency costs exists. However, Hypothesis 2 is not supported in the case of Taoism.

Results reported in Tables 6 and 7 do not echo the traditional view that Buddhism and Taoism are essentially the same (“Fo Dao Yi Jia” in Chinese), but support that different religions have asymmetric influence on owner-manager agency costs. This finding provides additional evidence for religious literature whether different religions have asymmetric consequence on business behavior. Maybe differentiations between Buddhism and Taoism can be responsible for above difference.

Buddhism is China's oldest foreign religion, while Taoism is a genuinely Chinese religion with a very long history (nearly 1,900 years ago). Buddhism emphasizes “Karma” or the belief that kindness always begets kindness, which may restrain managers behave themselves, e.g., upgrading the efficiency of managers' control

**Table 10** Robustness checks of owner-manager agency costs on religion, external monitoring mechanisms and other determinations

Variable	Dependent variable: expense ratio				Dependent variable: asset utilization ratio							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	RELIGION100	RELIGION200	RELIGION300	RELIGION100	RELIGION200	RELIGION300	RELIGION100	RELIGION200	RELIGION300	RELIGION100	RELIGION200	RELIGION300
Panel A: Robustness checks using firm-year observations that had existed before my sample period (2001–2010)												
RELIGION	-0.0083*** (-3.87)	-0.0046*** (-4.53)	-0.0029*** (-4.37)	-0.0040*** (-6.77)	-0.0027*** (-9.58)	-0.0015*** (-9.43)	0.0338*** (6.51)	0.0133*** (4.91)	0.0087*** (4.80)	0.0085*** (4.97)	0.0046*** (5.31)	0.0031*** (6.10)
RELIGION × MKT	0.0008*** (3.24)	0.0003*** (2.95)	0.0002*** (3.02)	0.0002*** (3.02)	0.0002*** (3.02)	0.0002*** (3.02)	-0.0044*** (-6.68)	-0.0017*** (-5.19)	-0.0010*** (-4.89)	-0.0010*** (-4.89)	-0.0010*** (-4.89)	-0.0044*** (-4.12)
RELIGION × BIG10	-0.0070*** (-4.21)	-0.0047** (-2.56)	-0.0045** (-2.45)	0.0037*** (4.17)	0.0022*** (5.37)	0.0012*** (5.07)	0.0474*** (11.41)	0.0453*** (10.37)	0.0431*** (9.97)	0.1239*** (5.34)	0.1218*** (5.20)	0.1121*** (4.56)
BIG10	16.06 %	16.31 %	16.26 %	15.95 %	16.39 %	16.32 %	23.96 %	23.82 %	23.78 %	23.08 %	23.10 %	23.12 %
Number of Obs.	8, 062	8, 062	8, 062	8, 062	8, 062	8, 062	8, 062	8, 062	8, 062	8, 062	8, 062	8, 062
Panel B: Robustness checks using reduced industries' firm-year observations												
RELIGION	-0.0113*** (-3.01)	-0.0066*** (-3.32)	-0.0046*** (-3.51)	-0.0064*** (-6.72)	-0.0035*** (-7.21)	-0.0020*** (-7.12)	0.0571*** (5.23)	0.0255*** (5.13)	0.0181*** (5.64)	0.0210*** (6.49)	0.0091*** (5.60)	0.0055*** (5.96)
RELIGION × MKT	0.0009** (2.25)	0.0005** (2.28)	0.0004*** (2.88)	0.0004*** (2.88)	0.0004*** (2.88)	0.0004*** (2.88)	-0.0060*** (-4.68)	-0.0030*** (-5.22)	-0.0021*** (-5.75)	-0.0021*** (-5.75)	-0.0021*** (-5.75)	-0.0060*** (-3.52)
RELIGION × BIG10	-0.0069*** (-2.72)	-0.0047 (-1.64)	-0.0068** (-2.38)	0.0049*** (3.44)	0.0023*** (3.44)	0.0019*** (4.72)	0.0737*** (9.78)	0.0835*** (10.43)	0.0852*** (10.82)	-0.0182*** (-3.11)	-0.0102*** (-3.66)	-0.0060*** (-3.52)
MKT	13.35 %	13.69 %	13.46 %	13.47 %	13.90 %	13.70 %	33.72 %	33.75 %	33.83 %	31.92 %	31.81 %	31.83 %
BIG10	3, 124	3, 124	3, 124	3, 124	3, 124	3, 124	3, 124	3, 124	3, 124	3, 124	3, 124	3, 124
Adj_ R <sup>2</sup>	13.35 %	13.69 %	13.46 %	13.47 %	13.90 %	13.70 %	33.72 %	33.75 %	33.83 %	31.92 %	31.81 %	31.83 %
Number of Obs.	3, 124	3, 124	3, 124	3, 124	3, 124	3, 124	3, 124	3, 124	3, 124	3, 124	3, 124	3, 124

Notes: Year dummies, industry dummies and control variables are included in all regression models but not reported here for brevity. The values of *t* statistics are in parentheses. \*\*\* 1 %, \*\* 5 %, and \* 10 % levels of significance, respectively, for a two-tailed test. All reported *t* statistics are based on standard errors adjusted for clustering at the firm level. All the variables are defined in Table 11 in [Appendix](#)

operating costs and improving the efficiency of managers' deploying assets, and hence reduce owner-manager agency costs. However, Taoism advocates the pursuit of life health and physical immortality and has less help for ethical human behavior. Therefore, I do not find the significant association between Taoism and the reduction of owner-manager agency costs.

## Robustness Checks

### Robustness Checks Using Province-Level Religious Variables

In Tables 4, 5, 6, and 7, I utilize firm-level religious variables to provide strong and robust evidence that religion does reduce owner-manager agency costs. Next, I re-estimate Eq. (1) using the province-level religious variables to provide additional evidences for Hypothesis 1. In my study, I use two kinds of province-level religious variables: (1) RELIGION\_PRO\_NUM, the province-level religion intensity, measured as the number of Buddhist monasteries and Taoist temples in each province in China; (2) RELIGION\_PRO\_PER, the province-level religion intensity *per capita*, measured as the number of Buddhist monasteries and Taoist temples, scaled by total population in the province level.

As shown in Columns (1) and (2) of Table 8 in which expense ratio is the dependent variable, the coefficients on RELIGION\_PRO\_NUM and RELIGION\_PRO\_PER are all negative and significant at the 1 % level ( $-0.0062$  with  $t = -4.76$  and  $-0.1630$  with  $t = -2.89$ , respectively), suggesting that province-level religion intensity is negatively associated with expense ratio. As reported in Columns (3) and (4) in which asset utilization ratio is the dependent variable, the coefficients on RELIGION\_PRO\_NUM and RELIGION\_PRO\_PER are all positive and significant at the 1 or 5 % level ( $0.0073$  with  $t = 2.75$  and  $0.2696$  with  $t = 2.37$ , respectively), indicating that province-level religion intensity is positively associated with asset utilization ratio. Above results, taken together, provide additional support to Hypothesis 1. As for control variables in Table 8, the signs and significances are qualitatively similar to those in Table 4.

Note that I do not re-estimate Eq. (2) using province-level religious data. Unreported results suggest that there is serious multicollinearity between RELIGION\_PRO\_NUM (RELIGION\_PRO\_PER) and MKT, because the Marketization index (i.e., MKT) is also province-level data. The same reason can apply to BIG10. Therefore, it is unsuitable to include simultaneously RELIGION, MKT (BIG10) and their interaction item into Eq. (2).

### Discussion on Potential Endogeneity Between Religion and Owner-Manager Agency Costs

In motivating my model specification, I refer to extant studies and link religious variables based on geographic distance to owner-manager agency costs with the premise that Chinese listed firms' registered addresses decisions are *exogenous*. Hilary and Hui (2009) address the concerns about potential endogeneity between religion and corporate behavior, i.e., the direction of causality. However, the direction of causality or endogeneity between religion and owner-manager agency costs in my study is not a major threat for the following reasons:

First, Loughran and Schultz (2005), Loughran (2007), John et al. (2011), and El Ghouli et al. (2011, 2012) argue that corporate location decisions are exogenous and are motivated by tax purposes, labor costs, production inputs, customers and suppliers. Similarly, in my case, Chinese listed firms' choices of their registered addresses are also exogenous rather than are motivated by agency costs between management and shareholders.

Second, because of the restriction of the census register system, population mobility or migration is not universal in China. Therefore, my sample naturally excludes the possibility that the behavior of firms attract people of certain faiths (or no faith) to work together. In other words, it is more likely that the religious make-up of the population cause firms to behave in a certain way (e.g., lower owner-manager agency costs in my case).

Finally, as noted by Miller (2000), being irreligious represents risk-taking behavior in Western societies, but in Eastern societies, it is not always so. In fact, as the relations-based economy and the second largest economy in the world, religions in Chinese society tend to be less exclusive and the emphasis is on personal behavior. Therefore, it is impossible that a firm's behaviors attract people with common religious belief to work together.

Nevertheless, I conduct the following two robustness checks to address the concerns about endogeneity between religion and owner-manager agency costs.

(1) Following El Ghouli et al. (2011, 2012), I re-estimate Eqs. (1) and (2) using firm-years that had existed before my sample period (2001–2010). Next, I only report the results of main independent variables for brevity in Panel A in Tables 9 and 10 ( $N = 8,062$ )<sup>13</sup>:

As shown in Columns (1)–(3) of Panel A in Table 9, the coefficients on RELIGION100, RELIGION200, and RELIGION300 are all negative and significant at the 1 % level ( $-0.0027$  with  $t = -5.50$ ,  $-0.0020$  with  $t = -8.58$ , and

<sup>13</sup> The tabulated results for the robustness checks are available from the author upon request (*similarly hereinafter*).



−0.0012 with  $t = -8.51$ , respectively) when the dependent variable is expense ratio (ER). As presented in Columns (4)–(6) of Panel A in Table 9, When the dependent variable is asset utilization ratio (AUR), the coefficients on RELIGION100, RELIGION200, and RELIGION300 are all positive and significant at the 1 % level (0.0041 with  $t = 2.76$ , 0.0028 with  $t = 3.66$ , 0.0022 with  $t = 4.86$ , respectively). These results are consistent with Hypothesis 1.

Panel A of Table 10 reports robustness checks results of Hypothesis 2, and the dependent variable is expense ratio (asset utilization ratio) in Columns (1)–(6) [Columns (7)–(12)]. As shown in Columns (1)–(6) of Panel A, the coefficients on RELIGION100  $\times$  MKT, RELIGION200  $\times$  MKT, and RELIGION300  $\times$  MKT are all positive and significant at the 1 % level (0.0008 with  $t = 3.24$ , 0.0003 with  $t = 2.95$ , and 0.0002 with  $t = 3.02$ , respectively), and the coefficients on RELIGION100  $\times$  BIG10, RELIGION200  $\times$  BIG10, and RELIGION300  $\times$  BIG10 are all positive and significant at the 1 % level (0.0037 with  $t = 4.17$ , 0.0022 with  $t = 5.37$ , and 0.0012 with  $t = 5.07$ , respectively).

As reported in Columns (7)–(12), the coefficients on RELIGION100  $\times$  MKT, RELIGION200  $\times$  MKT, and RELIGION300  $\times$  MKT are all negative and significant at the 1 % level (−0.0044 with  $t = -6.68$ , −0.0017 with  $t = -5.19$ , and −0.0010 with  $t = -4.89$ , respectively), and the coefficients on RELIGION100  $\times$  BIG10, RELIGION200  $\times$  BIG10, and RELIGION300  $\times$  BIG10 are all negative and significant at the 1 % level (−0.0183 with  $t = -5.23$ , −0.0083 with  $t = -4.93$ , and −0.0044 with  $t = -4.12$ , respectively). Above results, taken together, provide strong and robust support to Hypothesis 2.

- (2) Following El Ghouli et al. (2011, 2012), Loughran and Schultz (2005), and John et al. (2011), I re-estimate Eqs. (1) and (2) using firm-year observations in reduced industries (e.g., the agriculture, mining, construction, transportation and warehousing, information technology, wholesale and retail, and production and supply of electricity, steam and tap water, etc.) because listed firms in these industries display a particularly pronounced tendency to locate in areas reflecting the nature of their production process. Note that I only report the results of main independent variables for brevity in Panel B in Tables 9 and 10 ( $N = 3,124$ ):

As shown in Panel B of Table 9, the coefficients on RELIGION100, RELIGION200, and RELIGION300 are all negative (positive) and significant at the 1 % level when the dependent variable is expense ratio (asset utilization ratio), providing additional support to Hypothesis 1.

Moreover, as reported in Panel B of Table 10, the coefficients on these interaction items between religious variables and external monitoring mechanisms are all positive

(negative) and significant at the 5 or 1 % level when the dependent variable is expense ratio (asset utilization ratio). These results are consistent with Hypothesis 2.

Above results, taken together, are qualitatively similar to those in Tables 4 and 5, and provide again support to Hypotheses 1 and 2.

#### Other Robustness Checks

Though not tabulated for brevity, I also conduct the following robustness checks:

- (1) Figure 1a–c shows that the number of Buddhist monasteries and/or Taoist temples distributes unequally across twenty-two provinces, four municipalities, and five autonomous regions of minority nationalities. Therefore, I delete firms located in these provinces, municipalities, and autonomous regions without a monastery or temple and re-estimate Eqs. (1) and (2) using reduced sample ( $N = 9,566$ ). Unreported results are qualitatively similar to those in Tables 4 and 5, and provide additional support to Hypotheses 1 and 2.
- (2) Unreported results show that the index of “standard deviation/mean” is smaller than 1 only when the standard distance is greater than 100 km. Note that higher index of “standard deviation/mean” indicates acuter relative discrete degree of random variables on the mean, and thereof it is more unsuitable to choose related distances as the criteria to define religious variables. Therefore, I do not adopt 20, 40, 50, 60, and 80 km as the standard distances to define religious variables, and re-estimate Eqs. (1) and (2) using different religious variables based on various standard distance (e.g., 120, 140, 150, 160, 180, 220, 240, 250, 260, and 280 km) in order to provide additional evidences for Hypotheses 1 and 2. Though not tabulated for brevity, related results are qualitatively similar to those in Tables 4 and 5, and provide additional support to Hypotheses 1 and 2.
- (3) To address the concern about whether the density of religious sites what are presumably older shrines is a proxy for urbanization, I use “GDP per capita” as the proxy for urbanization and examine the association between religion and GDP per capita. Unreported results suggest that there are no significant association between all the firm-level religious variables (province-level religious variables) and GDP per capita. Moreover, one can argue that the location of religious sites simply is a proxy for the share of Han Chinese in the population who in turn might be favored by government policy and have developed more “modern” enterprises with better corporate governance, and then influence owner-manager agency costs. To

address the concern, I examine the association between religion and corporate governance indexes. Unreported results indicate that there are no significant association between all the firm-level religious variables (province-level religious variables) and corporate governance indexes.

Above results, taken together, can partially exclude the possibility that religion influences other drivers and other drivers in turn affect corporate governance, and then reduce owner-manager agency costs. In other words, above robustness checks can strengthen the causality between religions and owner-manager agency costs in my case.

- (4) To exclude the influence of political, legal, and administrative factors on owner-manager agency costs, I include four variables, i.e., index of starting a business, index of registering property, index of enforcing contracts, and CEOs' political connections,<sup>14</sup> to re-estimate Eqs. (1) and (2). Unreported results are qualitatively similar to those in Tables 4 and 5. Nevertheless, unreported results also indicate that I have obtained more significantly estimated results with the increased adj- $R^2$ .

## Summary and Conclusions

Scholars have paid sustained attentions to agency problem and addressed their concerns about the influence of ownership, corporate governance, and other determinations which belong to formal system arrangement on owner-manager agency costs. However, they provide little evidence on whether and how religion, as one of informal systems, matters to and influence agency costs between management and shareholders. In this paper, I fill this gap and examine the impact of religion on owner-manager agency costs using a sample of Chinese listed firms.

My findings show that religion (i.e., Religion and Taoism on the whole) is significantly negatively associated with owner-manager agency costs, suggesting religiosity can curb managers from unethical business practices, and thus reduce agency costs (McGuire et al. 2012). Moreover, the negative association between religion and owner-manager agency costs is attenuated for firms with strong external monitoring mechanisms. This finding suggests that religion can serve as an alternative mechanism to work in emerging markets like China where formal institution system and external

monitoring mechanisms are incomplete. However, after separating Buddhism from Taoism, my study indicates that above conclusions are only available for Buddhism.

My findings have some ethical implications. First, unethically managerial activities may lower the efficiency of managers' controlling operating costs and the efficiency of managers' deploying assets. My findings suggest that religion does matter to and reduce owner-manager agency costs via restraining managers from unethical activities.

Second, traditionally, corporate governance mechanisms and codes of ethics are viewed as major channels to curb unethically managerial behavior or activities (Bonn and Fisher 2005; Felo 2001). However, in emerging markets like China, standard corporate governance mechanisms are under construction (they do not work effectively) and codes of ethics for managers are being formed. Therefore, religion, as one of informal system arrangements, can serve as an alternative to standard corporate governance mechanisms to curb unethically managerial behavior.

My study, of course, has its limitations. First, my study only examines the influence of two major religions (i.e., Buddhism and Taoism) in China on owner-manager agency costs. However, because of the limitation of data, I cannot test the impact of other religions such as Islam, Catholicism, and Protestantism on agency costs between management and shareholders. Second, I examine only the influence of religion on owner-manager agency costs and do not address concerns about whether and how religion can curb controlling shareholders' unethical behavior. Finally, I concede that my measure of religiosity may fail to fully capture the underlying spiritual status of Chinese people.

Nevertheless, I argue that my approach is impersonal. It is very difficult to assert people's spiritual status, so information from interview inevitably suffers some bias. While some surveys provide us some useful insights, there is frequently incongruence between interviewees' claims and actual thoughts. Accordingly, intensity of religious place is more objective. Moreover, extant U.S. studies use county-level or metropolitan-level measure of religious level due to the pattern of their initial data. It gives rise to the curiosity that firms within one area exhibit alike or differently. My measure can relatively display some variation of religiosity among different firms in the same province.

In closing, I call for more detailed cross-country (cross-culture) studies to complement the results of within-country investigations. Moreover, I suggest more detailed studies on the different effects of various religions on owner-manager agency costs (e.g., Buddhism and Taoism in my case). I believe that cross-country and cross-religion studies can achieve important, useful, and better understandings of the value of religion in curbing unethically managerial behavior and reducing agency costs between management and shareholders.

<sup>14</sup> Please note that index of starting a business, index of registering property, and index of enforcing contracts are based on the indexes of "the ease of doing business in China" provided by the World Bank (2008), and I handle-collected data of CEOs' political connections.

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## Appendix

See Table 11.

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**Table 11** Variables definitions

Variable	Definition
Variables for main tests	
ER	Expense ratio, a positive proxy for agency costs between management and shareholders, measured by sale expenses and administrative expenses scaled by annual sales (Ang et al. 2000; Singh and Davidson 2003);
AUR	Asset utilization ratio, an inverse proxy for agency costs between management and shareholders, measured by annual sales divided by current total assets (Ang et al., 2000; Singh and Davidson 2003);
RELIGION100	The number of Buddhist monasteries and Taoist temples within a radius of 100 km around a listed firm's registered address;
RELIGION200	The number of Buddhist monasteries and Taoist temples within a radius of 200 km around a listed firm's registered address;
RELIGION300	The number of Buddhist monasteries and Taoist temples within a radius of 300 km around a listed firm's registered address;
MKT	Fan et al.'s Marketization Index (Fan et al. 2010), which measures the whole institution development of each province in China and the investor protection of each region;
BIG10	When the auditor is a Big 10 accounting firm (including affiliated firms) according to the official rank of the Chinese Institute of certified public accountants and 0 otherwise;
FIRST	The percentage of common shares owned by controlling shareholder;
MANSHR	The percentage of shares owned by a firm's managers;
INDR	The ratio of the number of independent directors to the number of the board of directors;
LNBOARD	The natural log of the number of the board of directors;
DUAL	An indicator variable that is equal to "1" if the CEO and the chairman of the board are the same person, and "0" otherwise;
SIZE	Firm size, measured by natural log of total assets;
LEV	The ratio of total liabilities to total assets;
LISTAGE	The number of years since a firm's IPO;
STATE	A dummy variable, equaling to 1 when the ultimate controlling shareholder of a listed firm is a (central or local) government agency or government controlled SOE and 0 otherwise.
Variables for further tests or robustness checks	
RELIGION100_BM	The number of Buddhist monasteries within a radius of 100 km around a listed firm's registered address;
RELIGION100_TAO	The number of Taoist temples within a radius of 100 km around a listed firm's registered address;
RELIGION200_BM	The number of Buddhist monasteries within a radius of 200 km around a listed firm's registered address;
RELIGION200_TAO	The number of Taoist temples within a radius of 200 km around a listed firm's registered address.
RELIGION300_BM	The number of Buddhist monasteries within a radius of 300 km around a listed firm's registered address;
RELIGION300_TAO	The number of Taoist temples within a radius of 300 km around a listed firm's registered address;
RELIGION_PRO_NUM	Province-level religion intensity, equaling to the number of Buddhist monasteries and Taoist temples;
RELIGION_PRO_PER	Province-level religion intensity <i>per capita</i> , equaling to the number of Buddhist monasteries and Taoist temples, scaled by total population in the province.

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