***Religiosity And Financial Distress in US Firm***

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***Abstract***

In our paper, we try to test the global impact of religiosity on firm‘s durability. Given that religious firms are more ethics and take less risk, they avoid the costs of misconduct, and they benefit from the good reputation and the excellent relationship with their stakeholders. So, we predict that higher degrees of religiosity can reduce the financial distress. According to this prediction, we detect that corporates headquarters situated in more religious U.S. counties are probably less to suffer from financial problems. We also note that this negative relation becomes stronger during the crisis period. We conclude that the lack of religiosity is a significant cause of the financial difficulty.

**Keywords:** Religiosity - ethics - risk aversion - financial distress

**Introduction**

The financial crisis is a spiritual crisis. In fact, this crisis is a values crisis. Many religious leaders advise people to remove their money from the big banks that have proved an enormous lack of morals (Washington Post, 2010). $8.7 trillion investor dollars managed employing faith-based or other screening methods. The number of faith-based advisers is rising. They advise their clients to avoid investing in “sin stocks” like tobacco, gambling… Indeed, incorporating religious values into financial investment reduce debt; have a positive social impact and a positive financial return. (The Wall Street Journal, March 2017)

Moreover, there is a significant evolution in the relations between the corporate world and faith. Sister Patricia Daly is a Dominican nun. She engages in putting pressure on the firms to be more socially responsible. The General Electric executive said that for many years many people avoid meeting Sister Patricia Daly, but now they look for her. (Religion news service, May 31, 2017)

The earlier studies have used religion as a proxy for culture across countries. Stulz and Williamson (2003) tried to find a direct association between culture and finance. They note that religion influences finance across at least three ways. First, the ethics and values depend on the religion of the country. For example, charging interest is different from country to another. Second, the institutions depend on the religion. Indeed, the legal system is affected by culture. Finally, culture influences how resources are distributed in an economy. Indeed, the religion which encourages the expenditure of money in churches or guns decreases the resources using for the investment in production. Stulz and Williamson (2003) provide evidence that differences in culture are essential to understanding why investor protection differs across countries. In fact, Catholic countries have significantly weaker creditor rights than other countries. The role played by culture in economic life has been widely discussed. Rich literature found that the all differences between countries can be explained by culture (Lal, 1999; Greif, 1994; North, 1990; Landes, 2000). All these researches examine the influence of culture on economic growth across countries.

Then, papers used the local religiosity of the county in the United States as a proxy for corporate culture because it is quite easy to measure (Jiang et al. 2017). Ahmed et al., (1999) defined corporate culture as “the pattern of arrangement, material or behavior which has been adopted by a society (corporation, group, or team) as the accepted way of solving problems’’. However, how religious attitudes affect corporate behavior is not well assumed. Lagace (2001) consider the combination of personal religious values with organizational behavior is one of the areas of research that are not sufficiently investigated. Many studies argue that firms located in more religious areas are less likely to be implicated in accounting fraud, tax avoidance, and stock price crashes (McGuire et al. 2012; Boone et al. 2013; Grullon et al. 2010; Callen and Fang 2015).

This paper expands on this area of research by exploring how local religious norms are a kind of social influence affecting the firm‘s durability. Specifically, we examine whether religious social norms have an impact on financial distress in the USA.

Three factors motivate this study.

First is the lack of research on the effect of religiosity on the financial distress. The earlier research treated the relation between individual religiosity and risk aversion at the individual level such as Ahmad (1973) and Rokeach (1968). At a later stage, many papers discussed how individual religiosity affects corporate behavior. Hilary and Hui (2009) studied the relation between religiosity and making decision in US firms. Adhikari and Agrawal (2016) examined whether the risk preferences of managers influence a bank's risk-taking behavior. Grullon et al. (2010) treat the relation between religiosity and excessive compensation. Other papers report a connection between religiosity and the firm’s decisions such as leverage, tax avoidance, accounting manipulation, but studying the consequences of these behaviors on the financial health of the company is not very explored except the paper of Callen and Fang (2015) which investigates the relation between religiosity and future stock price crash risk. If religiosity has an impact on the financial health of the firms, it would be beneficial to standard-setters, investors, and regulators to take into consideration this factor (Barro and McCleary 2003; Guiso et al. 2006).

Second, according to a survey conducted by PricewaterhouseCoopers and the Economist Intelligence Unit in 2008, 73% of participants find that culture and excessive risk-taking are the most important causes of financial crisis. Furthermore, in a testimony to the US House of Representatives, Lo (2008) says “…the ultimate origin of the crisis may be human behavior....”. Indeed, it seems that human behaviors could explain the firms' risk-taking behavior during the financial crisis. Moreover, until now, media coverage accuses the human nature. (Quartz, September 13, 2018)

Giving that religiosity decreases the risk preferences of managers (He and Hu, 2016) and in the other hand, this risk preference promotes the corporate’s risk-taking behavior (Adhikari and Agrawal, 2016) it is fascinating to see if religious firms have been able to overcome financial problems in the period of crisis.

Finally, according to the analyses conducted by Moody’s Analytics about the states in recession[[1]](#footnote-1) and the survey of Gallup[[2]](#footnote-2) concerning the most and the least religious states in the USA in 2008, three remarks can be detected. First, the impact of the financial crisis depends on the geographic locations. So, some states had a tolerable expansion. Nevertheless, others were in a recession. Then, the religiosity in the U.S. context varies from state to state. For this reason, many papers treated the impact of religiosity on corporate behavior in the US context. These papers overcome the problem linked to the international context. In fact, studying the effect of religion on a firm’s decisions like earning manipulations in the international context (Kanagaretnam et al. 2015) will create a significant problem. In this case, it is complicated to separate the effect of the country’s legal and institutional characteristics from the impact of religiosity. So, studying the effect of religiosity in the U.S. context allows us to control the relationship. Moreover, it is a very rich context for testing our hypotheses, and it contains 11 nations with different cultures. (Business Insider, 2015)

Third, in 2008, the most religious states had a tolerable expansion such as Texas with 74% of religious residents, Alabama with 82% of religious residents and Oklahoma with 75% of religious residents. However, the least religious states were in a recession like Nevada with 54% religious residents and Massachusetts with 48% religious residents. So, it is very interesting to study the impact of religiosity on a firm’s financial distress.

Our paper extends the literature by providing new evidence regarding the role of religiosity in the economy. First, our study on religiosity complements the papers dealing with the importance of Psychological skills in corporate decisions such as CEO overconfidence (Leng et al. 2018) and CEO narcissism (Rijsenbilt and Commandeur, 2013). Second, studying the effect of religiosity on corporate financial health constitutes a global view of the importance of social norms and complements the previous papers which take a single impact of religiosity like Hilary and Hui (2009), Adhikari and Agrawal (2016), Li et al. (2017)…

We note that firms located in more religious regions are less likely to have financial distress; according to the view that local religiosity induces a risk-averse corporate culture and a high degree of ethics. In particular, local religiosity negatively influences financial distress measured by the inverse of Altman Z-Score. This negative relation becomes stronger in the financial crisis of 2008. This finding is coherent with the view that firms with religious culture are less susceptible to crisis. Our results still robust when we use the revised Atman Z” score as a proxy for financial distress.

This paper is organized as follows. Section 2 reviews the social norm theory and the literature on the association between religiosity and financial distress. Section 3 presents the data and variables. Empirical results are provided in Section 4. Section 5 reports robustness checks. Finally, Section 6 concludes.

**Literature Review and Hypotheses Development**

There is two stream of research explain the relationship between religion and economic. The first one is macroeconomic. It relates religion to economic growth and higher per capita income (Barro and McCleary, 2003; Guiso et al. 2003), explains how a country’s principal religion predicts the cross-country variations in investor protection (Stulz and Williamson, 2003) and documents that sharing the same religion can promote the foreign direct investments between two countries (Guiso et al. 2009). This stream of literature explains the role played by religion in the economic growth. The second stream describes how individual behaviors conducted by beliefs and ideologies affect financial behaviors (Hirshleifer, 2014). In this case, we talk about religiosity and not religion. In fact, the level of religiosity in the United States counties explains the corporate behaviors in US firms: risk exposures (Hilary and Hui, 2009), quality of financial reporting (Dyreng et al. 2012; McGuire et al. 2012; Li et al. (2017)), and unethical misconducts (Grullon et al. 2010).

Departing from the idea that corporate decisions are made by individuals, not firms (Hilary and Hui, 2009), the social norm theory predicts that the dominant norms and beliefs in the geographic location of the firms influence the decision made by managers. In other words, religious standards will affect the behavior of managers even they may or may not be religious because these latter live and operate in an environment which social rules of the local population constitute an essential element (Sunstein, 1996; Cialdini and Goldstein, 2004).

Indeed, individuals desire to comply with the conducts of the others because they want to avoid the expenses or penalties associated with rejecting the standards or beliefs that are considered admissible or suitable for the local people (Sunstein, 1996).

Social norms are reinforced by the social proof heuristic (Cialdini, 1993). This psychological phenomenon stipulates that Individuals follow the surrounding people because they believe that the dominant group has more knowledge about the correct behavior (Cialdini, 1993). Therefore, geographic locations with strong religious beliefs increase the likelihood that managers are affected by religious social norms (Kennedy and Lawton 1998).

In the beginning, researches in finance and accounting ignored the effect of human behavior on the firm policies. After that, growing literature suggests that the human aspect was a missing link in the corporate making decisions (Bertrand and Schoar, 2003; Malmendier et al. 2011). Indeed, the first paper investigates the effect of local religiosity on firm profitability and risk aversion was the work of Hilary and Hui (2009). Then, researches were interested in the impact of religiosity on the financial reporting quality (Dyreng et al. 2012; McGuire et al. 2012; Li et al. 2017), on the excessive compensation (Grullon et al. 2010), on the risk aversion (He and Hu, 2016, Gao et al. 2017), on the crash risk (Callen and Fang, 2015), on the credit rating and debt cost (Jiang et al. 2017).

All these researches highlight the importance of religiosity on the corporate policies and decisions. This effect can influence the durability of the firm. Indeed, the literature demonstrates that some traits of CEO affect the financial distress: overconfidence increases the financial failure (Leng et al. 2018), CEO narcissism has a positive relationship with accounting manipulation (Rijsenbilt, and Commandeur, 2013).

The literature has focused on two characteristics about firms located in regions with high religiosity (Jiang et al. 2017): ethics (Li et al. 2017; Duarte et al. 2012) and risk aversion (He and Hu, 2016).

**Ethics**

Many papers find that religious firms have a lower accounting manipulation, a lower tax avoidance, a higher accounting conservatism (Li et *al*. 2017). Moreover, Omer et al. (2016) provide evidence that religiosity influences auditor opinions.

This ethical behavior is essential for many reasons. First, it can prevent the damage related to misconduct behavior. Indeed, there is a negative relation between earning management and firm performance (Fairfield et al. 2003) and a negative relation between tax avoidance and stock price (Hanlon and Slemrod, 2009). Regarding that firms located in more religious counties are less likely to experience accounting fraud due to the importance of social norms in the religious community (Dyreng et al. 2012; Grullon et al. 2010), they are more likely to avoid the cost of misconduct.

Second, ethical behavior can minimize the agency costs which can be classified into two kinds. The first kind of agency cost is related to the divergence between the agent’s interest and the principal’s interest. Giving that ethics provide members the ability to distinguish between ethical and unethical experience, religious firms do not consider earning manipulation as ethical behavior (Weaver and Agle, 2002). Moreover, Merchant and Rockness (1994) find that religiosity and education affect the ethical judgments about earnings management and Longenecker et al. (2004) consider that religious beliefs influence the accounting choices of CEO such as religious CEO prefers to use real earning management than accruals manipulations (Hilary and Hui, 2009). Furthermore, Du (2012) find a negative relationship between religion and principal- agent agency cost. He concludes that religion constitutes a mechanism curbing the agency cost. The second kind of agency costs is related to mechanisms using to align the interests of the manager with those of the shareholders. Hilary and Hui (2009) suggest that the impact of religiosity on the financial reporting irregularities is widespread especially when we have weak corporate governance. In this case, social norms play the role of control and substitute the governance mechanisms (Du, 2012). To sum up, religious firms are less likely to have financial problems since religiosity can reduce the agency cost.

Third, the ethical behavior can maintain and improve the firm’s reputation. So, corporates built and leverage a good relationship with their stakeholders. He and Hu (2016) find that firms with high religious values have favorable loan conditions. Furthermore, the increase of the level of religiosity reduces about 8.9 basis points of the level of loan spread. Indeed, religiosity is based on trust, and trust is elementary for the lending decisions (Guiso et al. 2003). Furthermore, the reliability constitutes an essential condition for loans (Duarte et al. 2012). In the same order of idea, Guiso et al. (2015) find that employees work hard if they consider the CEO as trustworthy and honest. So, religious firms are more socially responsible than others firms (Kim et al. 2018). For this reason, they can maintain a good reputation and avoid some costs.

## Finally, the ethical behavior increases the sales of the firms. In fact, Hilary and Hui (2009) find that religious firms have a good performance. Furthermore, firms headquartered in areas of high social faith tend to have smaller crash risks (Li et al. 2017).

**Risk Aversion**

Another trait of religious firms is the risk aversion. Beginning with the paper of Hilary and Hui (2009), these authors point out that religious firms invest less than no religious firms. Indeed, religious firms do not prefer risk. However, Kumar et al. (2011) mention that the gambling attitude depends on the religion. For instance, Protestants have strong opposition. However, Roman Catholics have a moderate view for gambling. Adhikari and Agrawal (2016) study the impact of religiosity on the variation of bank risk-taking. They find that banks located in more religious regions have a high risk aversion. Indeed, they increase their assets carefully, they invest less in risky products, and they do not encourage their managers to take many risks. So, they are less exposed to crises than the no religious banks. In the same order of idea, He and Hu (2016) argue that banks give favorable loans conditions for firms located in religious areas because they are less vulnerable to financial problems.

The theoretical framework of our research is summarized in the figure1. According to social norm theory, managers are influenced by social norms in more religious areas. Many papers find that religious firms have higher performance, lower accounting manipulation, lower tax avoidance, and favorable loan conditions … For these reasons, they maintain a good relationship with their shareholders and their stakeholders such as lenders, employees, government…In the same order of idea, the misconduct of Enron consists of using earning management to create values for own interests, having a high level of tax avoidance and less accounting transparency (Tonge et al. 2003). So, this corporate had lost the trust of their stakeholders. (McAfee, 2012)

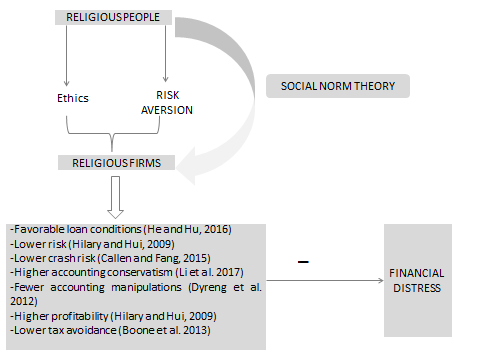
Given above, we expect that religious firms suffer less from financial problems. Put differently; there is a negative relationship between religiosity and financial distress.

**H1:** Firms in lowly religious regions have more financial distress than firms in highly religious areas.

After the last crisis, many papers seek to understand the reasons for the financial crisis. Among the causes, corporate culture has received much attention. It seems a crucial factor.

Kanagaretnam et al. (2014) try to test the relation between some traits of culture and having financial problems during the crisis. They find that banks in low individualism and high uncertainty avoidance cultures are less likely to have financial troubles during the financial crisis. Indeed, people with high uncertainty avoidance do not appreciate the ambiguity and the uncertainty. For this reason, they take less risk, and they prefer a lower return with a known risk. In the same way, Adhikari and Agrawal (2016) note the negative relationship between religiosity and bank risk-taking becomes more intense during the crisis of 1998 and 2007–08. Banks in more religious areas are more attached to their culture and behaviors during the crisis, and they learn from the financial troubles.

**H2:** The negative relation between financial distress and religiosity becomes stronger during the crisis.



**Figure1: Theoretical framework of our research**

**Sample and Measure of Religiosity and financial distress**

To test these hypotheses, we use Compustat North America. We focus only on US firms for the same reason presented by Hilary and Hui (2009) and Adhikari and Agrawal (2016). Basically, religiosity differs from county to another in the USA. So, we can isolate the impact of a country’s legal and institutional characteristics from the effect of religiosity. We consider a firm’s location as the location of its headquarters. Pirinsky and Wang (2006) suggest that headquarters are usually close to a firm’s main activities. Also, following prior studies, we admit a contagion effect of local norms. Individuals are affected by the dominant local culture even if they do not share it.

Data on religiosity took from the Churches and Church Membership files of the American Religion Data Archive (ARDA) website, which has county-level religion statistics on Judeo-Christian bodies every ten years. Religiosity data is available for five years 1971, 1980, 1990, 2000, and 2010. Following Hilary and Hui (2009), we obtain estimates for the intermediate years by linearly interpolating the decennial data.

The locations of firms’ headquarters are obtained from Compustat to match firm and county-level data. However, the number of observations is very low. We determine the location of missing firms manually by matching postal code and state[[3]](#endnote-1). We exclude all financial services (2-digit SIC codes between 60 and 69) from the sample because high leverage in financial firms does not have the same meaning in the others firms (Fama and French, 1992). Our sample period is from 1974 through 2010. Our analysis includes 8333 firms and 78 317 firm-years of observations.

**Measuring religiosity**

Following Hilary and Hui (2009), we estimate the religiosity of a firm by the ratio of religious members to the population of the county where the firm is headquartered. Two reasons can explain the efficacy of this ratio. First, in USA, employees are likely to work in their local communities. So, firms located in religious areas have a great proportion of religious employees. Second, according to social norm theory, people tend to follow the dominant beliefs and the behavior of people around them.

**Measuring financial distress**

The measure of financial trouble is based on the Altman Z score (Altman, 1968). In fact, financial ratios have a high probability to predict corporate failure.

Although given many critics related to the methodology, this accounting score is still used by literature (Bhaskar et al. 2017; Richardson et al. 2015; Donker et al*.* 2018; Chen et al. 2018). In fact, the results of this score should be interpreted carefully when the research is about non-US firms and non-manufacturing firms. To deal with the last problem, we conduct a robustness test to check the effectiveness of this score.

Basically, the Altman Z score is more able to predict financial distress than bankruptcy (Grice and Ingram, 2001)

***Z = 1.2 (working capital divided by total assets) + 1.4 (retained earnings divided by total assets) + 3.3 (earnings before interest and taxes divided by total assets) + 0.6 (market value of equity divided by total liabilities) +0.999 (sales divided by total assets)***

We identify a new variable namely Z score\_1968 to measure the financial distress (Bhaskar et al. 2017).

Z score\_1968= 0 if Z > 3 Safe zone

Z score\_1968 =1 if 1.81 ˂Z˂ 2.99 Gray zone

Z score\_1968= 2 if Z ˂ 1.81 Distress zone

A higher Z score\_1968 indicates a higher probability of distress.

We control for some firm’s characteristics. First, an unsatisfactory audit opinion is a negative signal. Hudaib and Cooke (2005) find that financially distressed firms are more likely to receive a qualified audit report from large audit firms.

We also control for the company’s debt position (Opler and Titman, 1994), firm size (Rajan and Zingales, 1995) and we include the year and industry dummies to control for fixed time and industry effects.

We include a set of county-level demographic characteristics from the U.S. Census Bureau in our analysis as control variables (Hilary and Hui, 2009). The variables are the total population of the county; education, measured as the proportion of county population above age 25 that has completed a bachelor’s degree or higher; income, which is the per capita personal income; male-female ratio, measured as the male population to the female population; Married, measured as percent of married people in the county.

We expect a positive effect of total population, income, and education on financial distress. While we predict a positive impact of male-female ratio and a negative impact of a percent of married people on financial distress because of the risk aversion. These demographic characteristics are from a census done in ten-year intervals. We linearly interpolate these variables for the intermediate years. The Appendix specifies all the variables in our regressions with data sources.

**Sample Description and Univariate Analysis**

**Descriptive Statistics**

First, we describe our sample across industries. Second, we present the summary statistics for dependent, independents and control variables.

Table 1 envisages the industrial distribution of our sample based on Fama and French classification that transfers the SIC classification codes into 49 industry groups.

**Table1: Distribution of firms by industry**

|  |  |  |  |
| --- | --- | --- | --- |
| Industry | Freq. | Percent | Cum. |
| Agriculture | 187 | 0.24 | 0.24 |
| Food Products | 1,129 | 1.44 | 1.68 |
| Candy & Soda | 246 | 0.31 | 1.99 |
| Beer & Liquor | 309 | 0.39 | 2.39 |
| Tobacco Products | 122 | 0.16 | 2.54 |
| Recreation | 846 | 1.08 | 3.63 |
| Entertainment | 1,225 | 1.56 | 5.19 |
| Printing and Publishing | 802 | 1.02 | 6.21 |
| Consumer Goods | 1,478 | 1.89 | 8.10 |
| Apparel | 1,139 | 1.45 | 9.55 |
| Healthcare | 1,857 | 2.37 | 11.93 |
| Medical Equipment | 2,640 | 3.37 | 15.30 |
| Pharmaceutical Products | 5,699 | **7.28** | 22.57 |
| Chemicals | 1,696 | 2.17 | 24.74 |
| Rubber and Plastic Products | 1,042 | 1.33 | 26.07 |
| Textiles | 617 | 0.79 | 26.86 |
| Construction Materials | 2,570 | 3.28 | 30.14 |
| Construction | 803 | 1.03 | 31.16 |
| Steel Works Etc | 1,236 | 1.58 | 32.74 |
| Fabricated Products | 429 | 0.55 | 33.29 |
| Machinery | 3,209 | 4.10 | 37.39 |
| Electrical Equipment | 1,312 | 1.68 | 39.06 |
| Automobiles and Trucks | 1,324 | 1.69 | 40.75 |
| Aircraft | 534 | 0.68 | 41.44 |
| Shipbuilding, Railroad Equipment | 91 | 0.12 | 41.55 |
| Defense | 190 | 0.24 | 41.79 |
| Precious Metals | 512 | 0.65 | 42.45 |
| Non-Metallic and Industrial Metal Mining | 554 | 0.71 | 43.16 |
| Coal | 184 | 0.23 | 43.39 |
| Petroleum and Natural Gas | 5,240 | **6.69** | 50.08 |
| Utilities | 3,064 | 3.91 | 53.99 |
| Communication | 3,264 | 4.17 | 58.16 |
| Personal Services | 732 | 0.93 | 59.10 |
| Business Services | 4,422 | 5.65 | 64.74 |
| Computers | 2,191 | 2.80 | 67.54 |
| Computer Software | 5,923 | **7.56** | 75.10 |
| Electronic Equipment | 4,182 | 5.34 | 80.44 |
| Measuring and Control Equipment | 1,819 | 2.32 | 82.76 |
| Business Supplies | 1,423 | 1.82 | 84.58 |
| Shipping Containers | 400 | 0.51 | 85.09 |
| Transportation | 2,900 | 3.70 | 88.80 |
| Wholesale | 2,835 | 3.62 | 92.42 |
| Retail | 2,226 | 2.84 | 95.26 |
| Restaurants, Hotels, Motels | 1,546 | 1.97 | 97.23 |
| Almost Nothing | 2,168 | 2.77 | 100.00 |
|  | 78,317 | 100.00 |

We notice that our sample is formed mainly by firms from the following industries: Pharmaceutical Products, Petroleum, and Natural Gas and Computer Software.

The panel A of Table 2 represents the mean, min, and max of the continuous variables. We note that religiosity varies between 0, 28 and 0, 77 with a low standard deviation 0, 11.

**Table 2: Descriptive Statistics**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Panel A** |  |  |  |  |  |
| Variable | Obs | Mean | Std.Dev. | Min | Max |
| Religiosity | 78317 | .523 | .117 | .284 | .777 |
| Leverage | 78317 | .257 | .249 | 0 | 1.335 |
| Size | 78317 | 4.811 | 2.229 | .392 | 10.25 |
| Log\_population | 78317 | 13.608 | 1.158 | 7.321 | 16.1 |
| Log\_percapita income | 78317 | 9.873 | .515 | 8.113 | 11.003 |
| Male\_female | 78317 | .956 | .04 | .852 | 1.261 |
| Education | 78317 | 28.769 | 10.254 | 4.031 | 68.8 |
| Married | 78317 | .766 | .066 | .443 | .924 |
|  | | | | | |

Panel B represents the distribution of our sample by financial health. We notice that 48% of firms are healthy and 32% of firms are in financial distress.

|  |  |  |
| --- | --- | --- |
| **Panel B** |  |  |
| Z\_score\_1968 | Freq. | Percent |
| 0 | 37,673 | 48.10 |
| 1 | 15,356 | 19.61 |
| 2 | 25,288 | 32.29 |
| Total | 78,317 | 100.00 |

Table 3 notes the frequency of audit opinion. Our sample is mainly composed of firms with unqualified opinion 70, 37%. This opinion means that financial statements comply with US GAAP and these statements represent fairly the financial situation of the firm.

**Table3: Frequency of audit opinion**

|  |  |  |  |
| --- | --- | --- | --- |
| Opinion | Freq. | Percent | Cum. |
| 0 | 216 | 0.28 | 0.28 |
| 1 | 55,110 | 70.37 | 70.64 |
| 2 | 2,373 | 3.03 | 73.67 |
| 3 | 129 | 0.16 | 73.84 |
| 4 | 20,486 | 26.16 | 100.00 |
| 5 | 3 | 0.00 | 100.00 |
| Total | 78,317 | 100.00 |
|  | | | |

**Univariate tests and correlations**

In order to study the binary associations between independent variables, we run a correlation matrix using a correlation test. The correlation coefficients between independent variables enable to explore the presence of a severe problem of multicollinearity. This problem is detected when the coefficient is higher than 0.8. (Franke, 2010)

**Table4: Correlation matrix**

**Pairwise correlations**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Variables | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| (1) z\_score\_1968 | 1.000 |
|  |

|  |  |  |
| --- | --- | --- |
| (2) Religiosity | -0.005 | 1.000 |
|  | 0.185 |

|  |  |  |  |
| --- | --- | --- | --- |
| (3) Leverage | 0.504 | 0.032 | 1.000 |
|  | 0.000 | 0.000 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| (4) Size | 0.010 | 0.043 | 0.081 | 1.000 |
|  | 0.006 | 0.000 | 0.000 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| (5) Population | 0.046 | 0.034 | -0.033 | 0.042 | 1.000 |
|  | 0.000 | 0.000 | 0.000 | 0.000 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| (6) Percapita Income | 0.120 | 0.092 | -0.049 | 0.083 | 0.188 | 1.000 |
|  | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| (7) Male\_female | 0.046 | -0.437 | -0.044 | -0.062 | 0.039 | 0.175 | 1.000 |
|  | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| (8) Married | -0.101 | -0.103 | -0.031 | -0.140 | -0.442 | -0.334 | 0.281 | 1.000 |
|  | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| (9) Education | 0.066 | 0.068 | -0.075 | 0.053 | 0.191 | 0.799 | 0.082 | -0.184 | 1.000 |
|  | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| (10) Auditor\_opinion | 0.216 | 0.012 | 0.134 | 0.085 | 0.046 | 0.292 | 0.069 | -0.156 | 0.171 | 1.000 |
|  | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

|  |
| --- |
|  |

This table shows that Correlation coefficients between independent variables are lower than 0.8, except Log\_percapita income and education (0.799). For this reason, we use the variance inflation factor (VIF) method to detect a serious problem of multicollinearity. The results show that there is no severe problem (Table5).

**Table 5: VIF**

|  |  |  |
| --- | --- | --- |
|  | VIF | 1/VIF |
| Percapita income | 3.808 | .263 |
| Education | 3.063 | .326 |
| Married | 1.795 | .557 |
| Male\_female | 1.672 | .598 |
| Population | 1.348 | .742 |
| Religiosity | 1.322 | .756 |
| Auditor opinion | 1.138 | .879 |
| Leverage | 1.039 | .963 |
| Size | 1.032 | .969 |
| Mean\_VIF | 1.802 | .969 |
|  | | |

**Main Multivariate Analysis**

We use panel data to study the relation between Zscore and religiosity over the years and across firms. We will select our estimator based on the results of the homogeneity test. With clustered standard errors, we obtain a variance estimate that is robust to potential heteroscedasticity and autocorrelation problems.

**Regression results**

Given that the homogeneity test results lead to confirm the presence of individual effects (Table 6), we estimate our coefficients using OLS regression with clustered standard errors at the firm level. All regressions control for a year and Fama French 49 industry fixed effect.

**Table 6:**

|  |  |  |
| --- | --- | --- |
| FISHER   |  | | --- | |  | | Sig |
| 8,42 | 0.0000 |

The univariate analysis suggests that the degree of a county's religiosity is negatively related to the degree of financial distress.

We now examine whether these relations persist after controlling for other potential determinants of financial distress and a set of county-level demographic characteristics.

We estimate the following regression:

**ZSCORE\_1968 it =β0 + β1 RELIGIOSITYit+ β2 AUDITOPNit +β3 LEVERAGEit + β4 SIZEit + β5 population it+ β6 education it +β7 married it + β8 percapita\_income it +β9male\_female it + +β10 Yrit+ β11 Indit + ε**

(see the Appendix for the variables definitions)

Panel A of Table 7 presents the outputs of regressions of financial distress for the sample. In column 3, Religiosity has a negative coefficient in explaining financial distress statistically significant at the 1% level. Consistent with our hypothesis, this result suggests that firms in more religious areas exhibit lower financial problems than the others firms after controlling for a firm-specific and county- specific variables. In economic terms, the estimated coefficient of −0.155 on Religiosity suggests that one standard deviation increase in the fraction of religious members leads to a decrease of about 0.018 (=−0.155\*0.117) in financial trouble.

Our result confirm the works of two lines of research. The first one suggests that religious beliefs have an impact on corporate decisions and thus on financial output. In fact, religious firms are less likely to have tax avoidance, to engage on fraud, to manage their earning ([Cai](https://papers.ssrn.com/sol3/cf_dev/AbsByAuth.cfm?per_id=858125) et al, 2019). For this reason, they are less likely to have financial distress. If we begin with the idea that the religious culture prevents firms from corporate misbehavior due to the ethics ([Biggerstaff](https://www.nber.org/people/lee_biggerstaff) et al., 2015; Davidson et al., 2015; Benmelech and Frydman, 2015), and encourages the aversion risk behavior so it minimizes many costs related to agency costs, lawsuits costs…. In the same order of idea, [Leventis](https://www.researchgate.net/profile/Stergios_Leventis) et al., (2018) find that religious firms are less likely to have agency costs. For this reason, the audit pricing is negatively related to religiosity.

The second line of research is related to the good reputation of religious firms. In fact, trust consitutes a guaarentee for many stakeholders. For example, Kim et al. (2018) consider that religiosity favorise a corporate social responsibility, He and Hu (2016) suggest that religious firms have a favorite loan conditions, and El Ghoul et al., (2012) find that religious firms benefit from a lower cost of equity than the no religious firms. All these arguments argue that the good image of religious firms offer them a great work conditions and then a good performance.

**Table 7: Regressions results**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Panel A Impact of religiosity on financial distress** | | | | | | | | | | |
| z\_score\_1968 | | Predict sign | Coef. | | St.Err | | t-value | p-value | | Sig. |
| Religiosity | | **\_** | **-0.155** | | 0.058 | | -2.69 | **0.007** | | **\*\*\*** |
| Auditor\_opinion | | **+** | 0.076 | | 0.003 | | 22.86 | 0.000 | | **\*\*\*** |
| Leverage | | **+** | 1.628 | | 0.022 | | 72.50 | 0.000 | | **\*\*\*** |
| Size | | **\_** | -0.049 | | 0.003 | | -14.54 | 0.000 | | **\*\*\*** |
| Log\_population | |  | 0.025 | | 0.006 | | 3.89 | 0.000 | | **\*\*\*** |
| Log\_percapita\_income | |  | 0.043 | | 0.059 | | 0.72 | 0.471 | |  |
| Education | |  | 0.002 | | 0.002 | | 1.59 | 0.112 | |  |
| Married | |  | -0.311 | | 0.147 | | -2.12 | 0.034 | | \*\* |
| Male\_female | |  | 0.150 | | 0.211 | | 0.71 | 0.476 | |  |
| |  | | --- | | Year effect **Yes**  Industry effect **Yes**  Cluster cusip **Yes** | | **Yes**  **Yes**  **Yes** | | | | | | | | | |
|  | R-squared | | | 0.383 | | Number of obs | | | 78317.000 | |
|  | F-test | | | 196.764 | | Prob > F | | | 0.000 | |
|  | \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 | | | | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Panel B Impact of religiosity on financial distress in the crisis period** | | | | | | | | |
| z\_score\_1968 | Coef. | | St.Err | | t-value | p-value | | Sig. |
| Religiosity | -0.142 | | 0.058 | | -2.46 | **0.014** | | **\*\*** |
| Auditor opinion | 0.076 | | 0.003 | | 22.85 | 0.000 | | \*\*\* |
| Leverage | 1.628 | | 0.022 | | 72.49 | 0.000 | | \*\*\* |
| Size | -0.049 | | 0.003 | | -14.54 | 0.000 | | \*\*\* |
| Log\_population | 0.025 | | 0.006 | | 3.90 | 0.000 | | \*\*\* |
| Log\_percapita\_income | 0.042 | | 0.059 | | 0.71 | 0.480 | |  |
| Education | 0.002 | | 0.002 | | 1.60 | 0.110 | |  |
| Married | -0.312 | | 0.147 | | -2.12 | 0.034 | | \*\* |
| Crisis 2008 | **0.280** | | 0.084 | | 3.33 | **0.001** | | \*\*\* |
| Religiosity\*Crisis2008 | **-0.424** | | 0.160 | | -2.65 | **0.008** | | **\*\*\*** |
|  | |  | |  | | |  | |
| |  | | --- | | Year effect **Yes**  Industry effect **Yes**  Cluster cusip **Yes** | | | **Yes**  **Yes**  **Yes** | |  | | |  | |
|  | |  | |  | | |  | |
| R-squared | | 0.383 | | Number of obs | | | 78317.000 | |
| F-test | | 192.445 | | Prob > F | | | 0.000 | |

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

The objective of Panel B is to see the effect of religiosity in the period of crisis. For this reason, we present this variable “Religiosity\*crisis\_2008”. We note that the variable “year2008” is positively related to financial distress (significant at the 1% level). However, when we introduce Religiosity, the coefficient of “Religiosity\*crisis\_2008” is negative and statistically significant. Consistent with our hypothesis, this result suggests that firms in more religious areas exhibit lower financial distress in the financial crisis of 2008.

In others terms, religiosity constituted a solution to curb the financial problems during the crisis.

## This result confirms the idea that financial system in US have a lack of ethics. Nelson (2017) notes that the financial crisis had a religious origin. In the same way, [Lewis](https://papers.ssrn.com/sol3/cf_dev/AbsByAuth.cfm?per_id=1429123) et al., (2010) consider that the lack of morals caused the financial crisis. So, religious firms are less likely to suffer from financial problems in 2008 than the others firms because they have more ethics and less risk taking. Adhikari and Agrawal (2016) note that banks in more religious counties are less likely to take risk in the period of crisis than the others banks and consequently, they are less likely to have troubles.

**Robustness**

We next conduct a set of robustness test to verify if our finding persist. For this reason, we utilize another measure of financial distress: the revised Altman Z” score. In fact, the original Altman Z score was used for manufacturing firms. For this reason, in 1995, Altman was introduced a revised score to fit different sectors.

The difference between Z score and Z” is the [elimination](http://www.synonymes.net/en/elimination.html) of the ratio sales/total assets. In fact, this ratio varies in the various sectors. For example, for High tech firms, the ratio sales/total assets is higher than manufacturing firms because total assets is very lower than sales. For this reason, we use, in this section, the Z” score to fit more all sectors.

The formula of Z” is as follow: (Altman et al. 1998)

***Z’’ = 6.56X1 + 3.26X2 + 6.72X3 + 1.05X4***

***Where:***

***X1: Working Capital/Total Assets***

***X2: Retained Earnings/Total Assets***

***X3: EBIT/Total Assets***

***X4: Book Value Equity/Total liabilities***

We introduce another variable namely Z” score\_1995 to measure financial distress.

Z”score\_1995= 0 if Z”> 2.60 Safe zone

Z“score\_1995 =1 if 1.10 ˂Z”˂ 2.60 Gray zone

Z“score\_1995= 2 if Z” ˂ 1.10 Distress zone

**Table 8: Robustness tests**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **PanelA: Impact of religiosity on financial distress using Z”\_score\_1995** | | | | | | | | |
| **Z”\_score\_1995** | Coef. | | St.Err | | t-value | p-value | | Sig. |
| Religiosity | **-0.172** | | 0.060 | | -2.86 | **0.004** | | **\*\*\*** |
| Auditor\_opinion | 0.085 | | 0.003 | | 25.86 | 0.000 | | \*\*\* |
| Leverage | 1.461 | | 0.022 | | 66.57 | 0.000 | | \*\*\* |
| Size | -0.105 | | 0.003 | | -31.04 | 0.000 | | \*\*\* |
| Log\_population | 0.028 | | 0.006 | | 4.37 | 0.000 | | \*\*\* |
| Log\_percapita\_income | 0.059 | | 0.061 | | 0.97 | 0.332 | |  |
| Education | 0.003 | | 0.002 | | 2.21 | 0.027 | | \*\* |
| Married | -0.353 | | 0.145 | | -2.44 | 0.015 | | \*\* |
| Male\_female | 0.161 | | 0.217 | | 0.74 | 0.458 | |  |
| |  |  |  | | --- | --- | --- | | |  | | --- | | Year effect **Yes**  Industry effect **Yes**  Cluster cusip **Yes** | | **Yes**  **Yes**  **Yes** | | **Yes**  **Yes**  **Yes** | |  | |  |  | |  |
| R-squared | | 0.376 | | Number of obs | | | 78316.000 | |
| F-test | | 178.945 | | Prob > F | | | 0.000 | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Panel B:** **Impact of religiosity on financial distress during the crisis period using Z”\_score\_1995** | | | | | | | | |
| **Z”\_score\_1995** | Coef. | | St.Err | | t-value | p-value | | Sig. |
| Religiosity | **-0.159** | | 0.060 | | -2.63 | **0.008** | | **\*\*\*** |
| Auditor\_opinion | 0.085 | | 0.003 | | 25.84 | 0.000 | | **\*\*\*** |
| Leverage | 1.462 | | 0.022 | | 66.57 | 0.000 | | **\*\*\*** |
| Size | -0.105 | | 0.003 | | -31.03 | 0.000 | | **\*\*\*** |
| Log\_population | 0.028 | | 0.006 | | 4.38 | 0.000 | | **\*\*\*** |
| Log\_percapita\_income | 0.058 | | 0.061 | | 0.96 | 0.338 | |  |
| Education | 0.003 | | 0.002 | | 2.22 | 0.026 | | **\*\*** |
| Married | -0.354 | | 0.145 | | -2.44 | 0.015 | | **\*\*** |
| Male\_female | 0.168 | | 0.217 | | 0.77 | 0.440 | |  |
| Crisis 2008 | **0.194** | | 0.077 | | 2.53 | **0.011** | | \*\* |
| Religiosity\*crisis2008 | **-0.419** | | 0.147 | | -2.85 | **0.004** | | \*\*\* |
|  |  | |  | |  |  | |  |
| |  |  |  | | --- | --- | --- | | |  | | --- | | Year effect **Yes**  Industry effect **Yes**  Cluster cusip **Yes** | | **Yes**  **Yes**  **Yes** | | **Yes**  **Yes**  **Yes** | |  | |  |  | |  |
| R-squared | | 0.376 | | Number of obs | | | 78316.000 | |
| F-test | | 175.068 | | Prob > F | | | 0.000 | |

In table 8 (Panel A), we can see that the negative relationship between religiosity and financial distress is still robust after using the revised Altman Z “score. The negative coefficient is significant at a 1% level. The effect of the crisis on financial distress is positive and very substantial (Panel B). However, this coefficient becomes negative when we introduce the impact of religiosity.

Despite using the revised Z “ score, the robustness test confirms our results about the impact of religiosity on the financial stability of US firms and especially in the period of crisis.

**Conclusion**

Religiosity seems to be very important in the economic development of the countries. Rupasingha and Chilton (2009) argue that the religion has an impact on the growth rate in USA and Guiso et al. (2008) explain why the religion symilarity between two countries facilates the trade volume. Another line of research was developped to explain the impact of religiosity on the financial and investement decisions due to ethics and risk aversion. Moreover, some researches find that religiosity has an impact on stock price crash risk ([Callen](https://www.cambridge.org/core/search?filters%5BauthorTerms%5D=Jeffrey%20L.%20Callen&eventCode=SE-AU) and [Fang](https://www.cambridge.org/core/search?filters%5BauthorTerms%5D=Xiaohua%20Fang&eventCode=SE-AU), 2015). In other word, it influences the firm's continuity. So, it is interesting to see if the financial troubles is also related to the religiosity of the firm. Many papers discussed the causes of financial trouble like leverage, tax avoidance, accounting manipulation… However, these causes are driven by the human behavior. This paper contributes to the literature by discovering the effect of religiosity on the financial distress of US firms. Using 78 317 observations, we find that the religiosity influences negatively the financial difficulty. This result becomes stronger in the crisis period, especially in the crisis of 2008. This negative relation remains robust after controlling a set of county-level characteristics and firm-level variables. Moreover, these results persist after using the modified Z” instead of the original Altman Zscore as a measure of financial distress.

Our study implies the importance of religiosity. In fact, it determines the financial stability of the firm. So, without ethics and with a lot of risk, firms can disappear. Our finding extends the previous papers. First, it completes the line of research about the role played by a behavioral factor such as religiosity which composed by values and beliefs. Second, it explains another cause of financial distress during crisis. For this reason, these results should be of interest of regulators because they can explain the effect of human behavior during the crisis and why some firms are more sensitive than others. In the same order of idea, many reasons were presented to explain the financial crisis such as economics financials and politics… however; all these arguments have two ultimate origins: the lack of ethics and the excessive risk taking. Consequently, it is not enough to enact laws to prevent the crisis but the rules must be made with morality and ethics.

Our study suffers from a major limitation related to the data availability. The period of the study is from 1995 to 2010 due to the data related to the religiosity. In fact, ARDA published every 10 years the data. For this reason, we are not able to study the effect of religiosity after crisis in long term and see if its impact is still working. Moreover, testing if religiosity can prevents the bankruptcy especially after crisis will be very useful, which we can suggest for future study.

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**Appendix. Variable Definitions.**

|  |  |  |
| --- | --- | --- |
|  | Measures | Sources |
| Dependent variable | **ZSCORE\_1968**:  Z score\_1968= 0 if Z > 3, Z score\_1968 =1 if 1.81 ˂Z˂ 2.99 and Z score\_1968= 2 if Z ˂ 1.81, | Compustat North America |
| Independent variable |  |  |
| Religiosity | Ratio of religious members to the population of the county where the firm is headquartered | American Religion Data Archive (ARDA) website |
| Control variables |  |  |
| County-level demographic characteristics | Population: Natural logarithm of Total population of the county.  Education: proportion of county population above age 25 that has completed a bachelor’s degree or higher.  Income: Natural logarithm of the per capita personal income.  Male-female ratio: measured as the male population to the female population.  Married: The percent of married people in the county | U.S. Census Bureau |
| Leverage | Ratio of total debt/total assets | Compustat North America |
| Size | Natural logarithm of total assets | Compustat North America |
| Audit Opinion | 0 Financial statements are unaudited  1 Unqualified Opinion.  2 Qualified Opinion.  3 No Opinion.  4 Unqualified Opinion With Explanatory Language.  5 Adverse Opinion. Auditor has expressed an adverse opinion regarding the financial statements of the company | Compustat North America |
| Yr  Ind | Year dummy variables  Industry dummy variables | Compustat North America |

Endnotes

1. https://www.economy.com/dismal/analysis/104331 [↑](#footnote-ref-1)
2. https://news.gallup.com/poll/114022/state-states-importance-religion.aspx [↑](#footnote-ref-2)
3. Using this website <http://www.zipcodestogo.com/county-zip-code-list.htm> [↑](#endnote-ref-1)