



# Religiosity and corporate risk-taking: evidence from Italy

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## Abstract

This study investigates the impact of local culture, as measured by religiosity, on corporate risk-taking, based on a sample of 155 Italian listed firms, involving 2,382 firm-year observations over the study period 2000–2016. The empirical estimation results suggest a statistically significant negative relationship between corporate risk-taking and religiosity, i.e., greater religiosity reduces corporate risk-taking behavior. Overall, these results are consistent with the empirical literature dealing with other nations on the relationship between corporate decisions and social values (local culture). Finally, the findings are robust to alternative empirical specifications.

**Keywords** Corporate risk-taking · Social values · Religion · Culture

**JEL Classification** G32 · G41 · A13 · Z12

## 1 Introduction

Recently, some studies have emphasized the role that social values, local culture, and religious beliefs play in explaining economic growth, corporate decisions, and organizational behavior, including agency costs, dividend policy, and corporate risk-taking (e.g., Chintrakarn et al. 2017; Diez-Esteban et al. 2019). Guiso et al. (2006, p. 23) define culture “... as those customary beliefs and values that ethnic, religious, and social groups transmit fairly unchanged from generation to generation.” La Porta et al. (1999) find that, beyond the institutional factors, there are other cultural factors, such as religiosity, that can influence corporate

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behavior. McGuire et al. (2012) find that religiosity can discourage managers from engaging in unethical business practices. Du (2013) and Chintrakarn et al. (2017) find that religious piety substitutes effectively for corporate governance in alleviating the agency problem. Furthermore, Diez-Esteban et al. (2019) find that religiosity has an impact on corporate risk-taking.

Using a sample of 155 public firms based in Italy, for 2,382 firm-year observations, over the period 2000–2016, this empirical study investigates for the case of Italy the relationship between corporate risk-taking and local culture, as measured by religiosity. The study contributes to the existing literature in two ways.

First, Italy has a history of being a locus of people with strong religious beliefs and arguably thereby provides us to test a “natural environment” for investigating the potential impact of religiosity on corporate risk taking. Indeed, the population of Italy has been especially strongly associated with the Catholic religion and its highest authorities as represented by the Papacy for the Roman Catholic Church. Catholic Social Teaching (CST) takes the position that a firm is a “common good” and has the right to earn a profit. Nevertheless, the owners must manage the firm using ethical behavior. Catholic Social Teaching (CST) recognizes the firm’s goal to profit on real investments based on the right risk without highly speculative financial activities. Therefore, religiosity actually could have a strong impact on corporate risk-taking behavior in Italy. We analyze data from ISTAT (*The National Institute for Statistics*) on the percentage of the population aged 6 years or older that attended a formal religious congregation at least once a week over the previous 12 months in the region where the firms’ headquarters are located. On average, data indicate that approximately 30% of the Italian population attend such religious congregations. Therefore, we hypothesize that Italian firms’ *religious beliefs* are likely to affect firms’ organizational behavior and be an essential factor in explaining an aversion to extensive corporate risk-taking.

Second, this study examines a single bank-based French Civil Law country that offers less overall shareholder protection and fewer creditor rights (La Porta et al. 1999) than typically provided in Common Law countries. Italian companies have a higher ownership concentration than typically found in other countries, and it is in theory potentially easier for the largest shareholder(s) to extract private benefits of control from the minority stockholders. Indeed, several previous empirical studies find that agency costs are more severe for Italian firms and that the probability of expropriation of wealth to the detriment of minority shareholders, through firms’ debt levels, pyramidal groups, dividend policies, and dual-class shares, is higher than other countries (e.g., Faccio et al. 2010; Dyck and Zingales 2004). Previous empirical studies also find that religious piety substitutes effectively for corporate governance in alleviating agency issues in countries other than Italy (Chintrakarn et al. 2017).

While a growing body of literature has investigated the relationship between religiosity and risk-taking in US and other countries, to our best knowledge few studies have examined civil law countries and no study has investigated Italy. Therefore, the goal of our paper is to measure if there is a relationship between religiosity and corporate risk-taking in Italian listed firms. Following other

studies (e.g., Harjoto and Rossi 2019; Rossi et al. 2019), we hypothesize that firms located in more religious areas exhibit lower levels of risk-taking.

This study consists of four more Sections. Section 2 discusses related literature and develops the hypotheses, while Section 3 describes the data sample and survey methodology. Section 4 provides the empirical results and a discussion of the findings, whereas Section 5 provides a brief summary of the estimation findings and the conclusions of this study.

## 2 Literature review and hypothesis development

There is a widely held belief that corporate culture affects corporate value. For example, Guiso et al. (2015) find that managerial integrity and managerial ethics affect firm value, although corporate governance seemingly does not influence corporate culture.

Literature in the field of psychology suggests that, *on average*, a more religious person is more risk-averse (Miller and Hoffmann 1995; Diaz 2000; Miller 2000; Bartke and Schwarze 2008; Liu 2010; Noussair et al. 2013; Cebula 2014; León and Pfeifer 2017). Some studies find that a higher degree of religiousness/religiosity can influence firms' policies and lower firms' risk-taking behavior (e.g., Callen and Fang 2015). Hilary and Hui (2009) find that firms located in counties with higher levels of religiosity display lower degrees of risk exposure, as measured by variances in equity returns or returns on assets. Such firms also exhibit a lower investment rate and less growth, but generate a more positive market reaction when they announce new investments. Chen et al. (2016) find that a greater degree of religiosity, i.e., stronger religious convictions regarding morality, play a more significant role in constraining opportunistic behavior towards minority stockholders; furthermore, this is found to be especially true in legal environment that are less protective of stockholder rights. Kanagaretnam et al. (2015) find that banks located in more religious countries exhibited lower levels of risk in their decision-making and were less likely to encounter financial difficulty or to fail during the 2007–2009 financial crisis.

Adhikari and Agrawal (2016) find that US banks headquartered in areas that are more religious exhibit lower risks and are less vulnerable to crises, since they tend to grow slower, hold safer assets, are less involved in non-traditional banking businesses, and provide less option compensation to their executives. Blau (2017) finds that religious adherence and religious beliefs lower the volatility of stock prices in Catholic counties in the US.

Renneboog and Spaenjers (2012) find that Catholics attach great importance to thrift and tend to be risk-averse. Protestants combine a more external locus of control with a greater sense of financial responsibility. León and Pfeifer (2017) find that different religious affiliations are associated with distinct financial risk-taking attitudes. Adherents to the two main Christian religions in Germany (Protestants and Catholics) have been found to be less risk-tolerant than the population as a whole. In another study (Diez-Esteban et al. 2019), it was found that that different religious backgrounds tend to have different impacts on corporate risk-taking. These impacts were found to be negative for predominantly Catholic and Islamic-based countries and positive for firms in

predominantly Protestant nations. Also, Gharbi et al. (2020) find that higher degrees of religiosity can reduce the financial distress. Specifically, they document that corporate headquarters situated in more religious U.S. counties are probably less to suffer from financial problems and that the negative relationship becomes stronger during the financial crisis.

Very few studies have investigated the potential relationship between religion and corporate risk-taking in single based French Civil Law countries such as Italy. Accordingly, this study hypothesizes that, *ceteris paribus*, given its impact on overall corporate behavior, greater religiosity reduces the degree of corporate risk-taking in Italy. In particular, this study examines a sample of Italian listed companies. It is recognized that the population in Italy has on average strong Catholic religious beliefs. A survey of Italian families has recently confirmed that Italian investors are largely risk-averse and prefer to hold low-risk investments in their portfolios. Furthermore, a high aversion to losses and a low-risk appetite remain quite common characteristics among Italian savers (Consob 2017). In other words, Italian investors are receptive to a (low) risk type of investment (Avvenire October 30, 2017).

The Catholic religion advocates that one should invest in socially responsible investments that protect against risk, reflecting ethical and honest behavior. Moreover, the Catholic religion advocates that one reduce the risk of conflict with stakeholders (Pope Francis, "*Oeconomicae et pecuniariae quaestiones*" May 17 2018). Catholic Social Teaching (CST) recognizes as legitimate the firm's goal to profit on investments based on a modest level of risk without engaging in significant speculative financial activities. Most of the Encyclicals written during several papacies, as well as *De Rerum Novarum* by Pope Leo XIII in 1891, *The Centesimus Annus* (CA) issued by Pope John Paul II, the encyclical *Caritas in Veritate* by Pope Benedict XVI and recent writings by Pope Francis, including *Evangelii Gaudium* and *Laudato Si*, are based on these very same principles. Catholic Social Teaching also suggests acting ethically and protecting the stakeholder's interest because the firm is regarded as a "common good" whose goals include earning reasonable profits and creating employment and wealth for the local community. Since corporate risk-taking is associated with unethical practices (Kish-Gephart et al. 2010) that, in turn, increase the expropriation of wealth to the detriment of minority shareholders, we hypothesize that the local culture (as proxied by greater religiosity) diminishes preferences for risk-taking by Italian companies and that firms headquartered in more religious areas within Italy tend to take less risk than firms located in less religious areas.

Based on the above discussion, our fundamental hypothesis is, as follows:

*Hypothesis 1 (H1): Listed firms in Italy that have headquarters located in areas characterized by higher religiosity undertake less risk-taking behavior*

### 3 Methodology and data analysis

Similarly to previous studies on religiosity and corporate decisions for Italian listed firms (e.g., Harjoto and Rossi 2019; Rossi et al. 2019) we build a sample of 155 non-financial and non-regulated companies that are listed continuously on the Italian

stock market during the period 2000–2016, which provides 2,382 firm-year observations. At the end of 2016, there were 244 listed companies on the *Mercato Telematico Azionario*. We exclude 44 financial firms, 14 utilities, and 31 companies because data are unavailable or the companies were suspended. We also exclude all new entry firms (IPOs) not listed continuously for at least five years over the period to 2016. Our final sample includes 155 firms, which enables us to build an unbalanced panel dataset that includes all non-financial and non-regulated Italian-listed companies whose individual time-series range from a minimum of 8 years to a maximum of 17 years. We also build our sample based on data that includes firm-specific characteristics (e.g., *SIZE*, *AGE*, *ROA*, *LEVERAGE*, *PAYOUT*, *ANALYSTS* and *CASH*).

The following OLS (Ordinary least square) describes the baseline specification:

$$y_{i,t} = \mu_{i,t} + \alpha_1 \text{RELIGIOSITY}_{i,t} + \alpha_2 \text{CONTROL\_VARIABLES}_{i,t} + \eta_t + \varepsilon_{i,t} \quad (1)$$

where  $y_{i,t}$  is the value of the dependent variable (*R&D*—Research and Development, *CASH\_FLOW*, *ST\_DEVIATION*) for firm  $i$  in year  $t$ .

However, instead of using *R&D* and *CASH\_FLOW* per se, we calculate the residuals of these two variables using the methodology of Biddle et al. (2009). Biddle et al. (2009) use the residuals as a firm-specific proxy for deviations from expected investment and then include the residuals estimated in the regression as dependent variables. Specifically, we run the first stage regression using the following equation:

$$\text{Investment}_{i,t+1} = \beta_0 + \beta_1 * \text{SalesGrowth}_{i,t} + \varepsilon_{i,t+1} \quad (2)$$

where the dependent variable  $\text{Investment}_{i,t+1}$  indicates, alternatively, *R&D* and *CASH\_FLOW*, while the independent variable  $\text{SalesGrowth}_{i,t}$  is measured as the annual change in revenue.

Using this methodology, we can construct two measures of excess risk-taking, namely, *EX\_R&D* and *EX\_CASH*. The *CONTROL\_VARIABLES* include a set of firm-specific characteristics, *SIZE*, *AGE*, *ROA*, *LEVERAGE*, *PAYOUT*, *ANALYSTS* and *CASH* (see Table 1 for precise definitions of the variables in the model). We also include *INDUSTRY* as measured by the four-digit SIC codes (excluding all SIC codes 6000–6999 and 4900–4999) using a set of dummy variables that measure nine different industries;  $\eta_t$  is the temporal dummy;  $\varepsilon$  is the residual term and  $t=2000, 2001, 2002 \dots 2016$ . Except for variables in logarithmic form, all variables with values higher than the mean plus-or-minus three standard deviations are considered outliers and winsorized to the 5th and 95th percentiles. This study collected data from *ISTAT*, *Bloomberg*, *COMPUSTAT*, *FactSet*, and *Calepino dell’Azionista*.

Both the dependent and independent variables have been chosen following the previous literature on risk-taking and agency costs (Jensen and Meckling 1976; Jensen 1986; John et al. 2008; Chintrakarn et al. 2017; Diez-Esteban et al. 2019; Hilary and Hui 2009; Harjoto and Rossi 2019; Rossi et al. 2019). Consistent with previous studies, we also use an instrumental variable approach (IV) to account for endogeneity and the possibility of reverse causality (e.g., Hilary and Hui 2009; Chintrakarn et al. 2017, 2018; Adhikari and Agrawal 2016; Rossi et al. 2019). In particular, we use an indicator variable, namely *LOG\_CHURCHES*, as

**Table 1** Variables definitions

Variables	Definition	Source
Alternative dependent variables		
ST_DEVIATION (SD)	Stock Price Volatility: 360 days	Bloomberg
R&D	Research and Development scaled by net sales	Bloomberg
CASH_FLOW	Free Cash Flow + Interest Expense*(1 - Effective Tax Rate/100), scaled by total assets	Our calculation by COMPUSTAT and Bloomberg
Independent variables		
RELIGIOSITY	The percentage of population aged 6 years or older that attend religious congregation at least once a week in the last 12 months in the region where the firms' headquarters is located	<i>The National Institute for Statistics (ISTAT)</i> at <a href="https://www.istat.it/">https://www.istat.it/</a> (under Social participation and Religious observances)
Control variables		
ANALYSTS	The number of financial analysts following the firm (in logarithmic form)	Bloomberg and <i>Borsa Italiana</i>
SIZE	Total assets (in logarithmic form)	Bloomberg
AGE	Years since firm establishment (in logarithmic form)	Firms' websites and <i>Catopino dell'azionista (Mediobanca)</i>
LEVERAGE	Total debt scaled by total assets	Bloomberg
ROA	Yearly net income/average total asset*100	Bloomberg
CASH	Cash and Cash Equivalents scaled by Net Assets	Our calculation by Bloomberg
PAYOUT	Total dividend scaled by total earnings	Bloomberg
INDUSTRY	Four-Digit SIC (Standard Industrial Classification) codes	<i>The National Institute for Statistics</i>
Instrumental variable (IV)		
LOG_CHURCHES	The number of Catholic Churches in the region where a firm has its headquarters (in logarithmic form)	Hand-collected by <a href="https://it.wikipedia.org/wiki/Diocesi_italiane_suddivise_per_provincia_ecclesiastiche">https://it.wikipedia.org/wiki/Diocesi_italiane_suddivise_per_provincia_ecclesiastiche</a> ; <a href="http://www.chiesaitaliane.chiesacattolica.it/chiesaitaliane/">http://www.chiesaitaliane.chiesacattolica.it/chiesaitaliane/</a> ; <a href="http://www.libertacivilimmigrazione.dlci.interno.gov.it/fondo-edifici-culto">http://www.libertacivilimmigrazione.dlci.interno.gov.it/fondo-edifici-culto</a>

EX\_R&D and EX\_CF indicate the residuals of research and development and cash flow, respectively

our instrumental variable. Although it is not easy to find a correct instrumental variable, we believe that the number of Catholic Churches is an acceptable instrument because it is correlated with *RELIGIOSITY* but not with our dependent variables (Greene 2012). We also use the number of Catholic Churches in logarithmic form (*LOG\_CHURCHES*) to take into account that in some regions the number of Catholic Churches is much higher than in other regions. For instance, the number of Catholic Churches ranges from 591 in Umbria to 3,527 in Triveneto. To construct this variable we manually collect the number of Catholic Churches for each region where a firm has its headquarters using several sources (see Table 1). In unreported results, we also use the number of Catholic Churches scaled by the population of the region where a firm has its headquarters as an instrumental variable, but the empirical results remain unchanged.

Tables 1 and 2 contain the descriptions and the descriptive statistics for all of the variables. We find a *RELIGIOSITY* rate of 29.5%, with a median equal to 30.7%; these values are higher than found by Hilary and Hui (2009) for the U.S. We also find, on average, that R&D, ROA and CASH are 0.49%, 0.9% and 11.3%, respectively. The mean firm age is 37 years and the mean of total assets is 2,890.197 (in thousands €). On average, the 155 firms have a debt-to-total asset ratio equal to 26.9%, with a standard deviation of 33.5%. The public firms in Italy tend to hold more cash and incur less debt but also are less profitable and smaller than the public firms in the U.S. (Hilary and Hui 2009; Chintrakarn et al. 2017).

**Table 2** Descriptive statistics

Variables	Average	Median	S.D
Alternative dependent variables			
R&D	0.496	0.000	1.346
ST_DEVIATION (SD)	0.335	0.337	0.165
CASH_FLOW	-0.002	0.011	0.073
Independent variables			
RELIGIOSITY	0.295	0.307	0.060
Control variables			
PAYOUT	0.229	0.000	0.305
SIZE (thousand euros)	2,890.197	326,23	1,813,00
SIZE (in logarithmic form)	2.596	2.513	0.768
FIRMAGE (in years)	37.00	26.00	31.73
AGE (in logarithmic form)	1.412	1.415	0.383
LEVERAGE	0.269	0.274	0.159
ANALYSTS	0.413	0.301	0.443
ROA	0.009	0.016	0.062
CASH	0.113	0.075	0.106
INDUSTRY	YES		
Number of observations	2,382		

EX\_R&D and EX\_CF indicate the residuals of research and development and cash flow, respectively

## 4 Empirical findings and discussion

The estimation results are provided in Table 3. In Column 1, we find that our instrumental variable is positively and significantly correlated with *RELIGIOSITY*, the key explanatory variable upon which this study principally focuses. We also find that, except for the variables *SIZE*, *AGE*, *ANALYSTS*, and *PAYOUT*, the remaining variables are not statistically significant.

In Column 2, we find that the coefficient on the dependent variable *RELIGIOSITY* is negative and statistically significant at the 1 percent level, implying that *EX\_R&D*, which is our first measure of risk-taking behavior, is a *decreasing function* of *RELIGIOSITY*, as hypothesized (in *H1*). For the interested reader, it is also observed that the coefficients on the control variables *CASH*, *ROA*, *AGE*, *ANALYSTS*, and *PAYOUT* are all statistically significant and positive, implying that all of these factors may *increase* risk-taking.

Thus, those firms that operate in more religious areas tend/are inclined to avoid excessive risk-taking. This result supports the idea that more religious firms adopt more ethical behaviors towards the shareholders by not investing stakeholders' interest. The results also show that firms that have more cash, that are older [i.e., are more established], that have greater profitability, and that make higher dividend payouts experience greater risk-taking behavior. At the same time, we also find that the number of financial analysts following the firm fails to effectively control unethical behaviors. In addition, although the coefficient on *LEVERAGE* is negative, it is not statistically significant. In any case, unlike the agency theory framework, the framework of stronger religious belief seems to curb firms' opportunistic behavior better than the traditional tools identified by Jensen and Meckling (1976).

Previous research (e.g., Chintrakarn et al. 2018) suggests that variable for religiosity, *RELIGIOSITY*, could suffer from endogeneity problems. We use the residuals from the first stage of our regression (Column 1), namely, the *INSTR\_RELIGIOSITY* variable, to check whether the results are driven by endogeneity. In Column 3 of Table 3, we find that results are extremely similar to those in Column 2, even when we thusly check for endogeneity. Based on the estimation results in Columns 4 and 5 of Table 3, we find that *EX\_CF* is negatively and significantly related to both *RELIGIOSITY* and *INSTR\_RELIGIOSITY*. In addition, firms that have headquarters in more religious areas hold less excessive cash flows and thereby take less risk. We also find that coefficients on variables *LEVERAGE*, *PAYOUT*, and *ANALYSTS* are all negative and statistically significant, implying negative impacts on excessive risk-taking behavior, whereas the positive and significant coefficients for the variables for profitability and the size of firms imply elevated excessive risk-taking behavior.

Furthermore, based on the findings shown in Columns 6 and 7, *SD* is a decreasing function of *RELIGIOSITY* and *INSTR\_RELIGIOSITY*, implying that firms whose headquarters are located in regions/areas with more pronounced religious beliefs experience less price volatility in the equity market. The coefficients for *SIZE*, *ROA*, and *PAYOUT* are all negatively significant, implying less share price volatility, whereas the share price for firms that have more debt, that have more financial analysts following, and that are older are less stable/more volatile in the stock market.



**Table 3** Empirical estimates using the residuals of R&D and cash flow and standard deviation of stock price as alternative dependent variables\*

	First stage (1)	EX_R&D (2)	EX_R&D (3)	EX_CF (4)	EX_CF (5)	SD (6)	SD (7)
<i>Constant</i>	0.2024*** (0.0299)	-0.5008*** (0.1881)	-0.9302*** (0.1422)	0.0049 (0.0097)	-0.0101 (0.0083)	0.3269*** (0.0246)	0.2974*** (0.0196)
<i>LEVERAGE</i>	-0.0021 (0.0090)	-0.0093 (0.1708)	0.0135 (0.1713)	-0.0321*** (0.0099)	-0.0313*** (0.0100)	0.0864*** (0.0235)	0.0884*** (0.0235)
<i>CASH</i>	0.0008 (0.0120)	0.9298*** (0.2877)	0.9007*** (0.2905)	-0.0497*** (0.0118)	-0.0508*** (0.0119)	0.0042 (0.0353)	-0.0019 (0.0350)
<i>SIZE</i>	0.0062*** (0.0019)	0.0351 (0.0529)	0.0201 (0.0536)	0.0121*** (0.0027)	0.0116*** (0.0023)	-0.0572*** (0.0064)	-0.0585*** (0.0063)
<i>ROA</i>	-0.0003 (0.0024)	0.0152*** (0.0048)	0.0165*** (0.0049)	0.0083*** (0.0002)	0.0084*** (0.0002)	-0.0079*** (0.0006)	-0.0077*** (0.0006)
<i>AGE</i>	-0.0250*** (0.0024)	0.3843*** (0.0617)	0.3800*** (0.0624)	-0.0014 (0.0036)	-0.0015 (0.0036)	0.1014*** (0.0089)	0.0954*** (0.0089)
<i>ANALYSTS</i>	-0.0072** (0.0035)	0.4471*** (0.0882)	0.4576*** (0.0892)	-0.0022*** (0.0035)	-0.0212*** (0.0035)	0.1065*** (0.0108)	0.1073*** (0.0108)
<i>PAYOUT</i>	0.0105** (0.0047)	0.3483*** (0.0900)	0.3455*** (0.0900)	-0.0074** (0.0036)	-0.0076** (0.0036)	-0.0002** (0.0001)	-0.0214** (0.0100)
<i>LOG_ CHURCHES</i>	0.3137*** (0.0997)						
<i>RELIGIOSITY</i>		-0.0158*** (0.0042)		-0.0005*** (0.0002)		-0.0013** (0.0005)	
<i>INSTR_RELIGI- OSITY</i>			-0.0155*** (0.4306)		-0.0005** (0.0002)		-0.3039*** (0.0576)
<i>INDUSTRY</i>	YES	YES	YES	YES	YES	YES	YES
<i>YEAR</i>	YES	YES	YES	YES	YES	YES	YES
<i>R-squared</i>	0.085	0.087	0.085	0.474	0.473	0.225	0.231
<i>Adj. R-squared</i>	0.074	0.074	0.072	0.466	0.466	0.215	0.221
<i>F-Value</i>	21.67***	25.83***	25.30***	68.57***	68.29***	46.57***	51.31***
<i>N. Obs</i>	2,382	2,382	2,382	2,382	2,382	2,382	2,382

\*The dependent variables EX\_R&D and EX\_CF indicate the residuals of research and development and cash flow, respectively. Estimated values have been calculate using the model of Biddle et al. (2009). INSTR\_RELIGIOSITY has been calculated as the residual of the first stage of regression (Column 1). \*\*\* and \*\* indicate statistical significance at the 1 percent and 5 percent levels, respectively

Overall, the estimation results support our hypothesis (H1) that firms located in more highly religious areas experience/engage in less risk-taking. They seem to adopt more ethical behavior in terms of the stakeholders’ interests. The results also suggest that religiosity, as a manifestation of cultural and social value, has a strong impact on corporate behavior, as argued by previous studies (La Porta et al. 1999; Guiso et al. 2006; Hilary and Hui 2009; Guiso et al. 2015; Chintrakarn et al. 2018; Diez-Esteban et al. 2019).

Moreover, it is observed that our results remain robust in several alternative specification estimations. In additional estimations, we adopt Generalized Method of Moment (GMM) two-step and Fixed-effect models using both the residuals (*EX\_R&D* and *EX\_CF*) of Biddle et al. (2009), and the traditional variables *R&D* and *CASH-FLOW*, but the conclusions are unchanged.

#### 4.1 Robustness check

Since our time horizon of analysis includes the period of economic and financial crisis and our results could potentially be driven by omitted variable bias, we also run an additional test. Specifically, we include in our regressions two additional variables, namely *CRISIS* and *CRISIS\*INSTR\_RELIGIOSITY*, to measure the moderating effects. If our results were driven by the crisis period, we would expect that the coefficient on *INSTR\_RELIGIOSITY* to lose strength and that the *CRISIS\*INSTR\_RELIGIOSITY* coefficient to exhibit a negative and statistically significant sign. Again, in un-reported results, we find that coefficient *INSTR\_RELIGIOSITY* keeps its negative and statistically significant coefficient while the coefficient of *CRISIS\*INSTR\_RELIGIOSITY* exhibits a not statistically significant value when the dependent variables are *EX\_R&D* and *EX\_CF* and a positive and statistically significant coefficient when the dependent variable is *SD*. Therefore, we can reject the conclusion that the results are driven by the crisis period. To the contrary, the results emerge strengthened and demonstrate more compellingly that religiosity discourages excess risk-taking practices.

We also include the percentage of shares held by larger shareholders as an additional control variable, but again the basic conclusions remain unchanged. Finally, it is also observed that the maximum value of VIFs (variance inflation factors) in the model is only 2.8, so that we can reasonably conclude that multicollinearity is not an issue in our analysis.

## 5 Conclusions

Historically, Italy has been strongly associated with the Catholic religion and the highest authorities in the Papacy for the Roman Catholic Church. Catholic Social Teaching (CST) points out that a firm is a "common good" and has the right to earn a profit, but in the interest of stakeholders, the owners must manage the firm using ethical behavior. Since religiosity as a cultural and social value has been linked to several behavioral traits, among others, honesty, risk aversion, good corporate governance, and ethical behaviors, we investigate the relationship between corporate risk-taking and religiosity. The analysis adopts a sample of 155 Italian listed companies during the period 2000–2016. Our results strongly support the idea that greater religiosity decreases corporate excess risk-taking and unethical behaviors by firms. From the agency theory perspective, religiosity can be a useful tool to control and monitor agency costs; moreover, this conclusion is obtained even when we include the most significant shareholders as an additional variable in our specification.

To our best knowledge, this study is the first that analyses the relationship between religiosity and corporate risk-taking in Italy. Previous studies suggest that Catholic religiosity dampen unethical behavior of firms. Harjoto and Rossi (2019) find that higher rate of religiosity increase the ethics rating of Italian listed firms. Rossi et al. (2019) find a positive relationship between religiosity and dividend payouts, with firms headquartered in higher religiosity areas paying more dividends than firms located in lower religiosity areas. Their results also suggest that religiosity of Italian firms could mitigate agency costs and that are consistent with the “bird in the hand” view as compared to the “two birds in the bush” view. Renneboog and Spaenjers (2012) find that Catholics attach more importance to thrift and are more risk-averse. Montenegro (2017), using a sample of Portuguese firms, finds a positive relationship between religiosity and financial reporting quality. Her results suggest that religiosity, together with other forms of external monitoring, represents a mechanism for reducing overly aggressive accounting practices.

Based also on previous findings, we believe that our results can be extended to countries with high catholic religiosity and lower investors protection (e.g., Spain, France and Portugal). Furthermore, our results provide valuable insights to academicians, corporate managers, investors, and regulators regarding the role of religiosity and social values as determinants in the decision-making process.

Anyway, our study, as other studies, suffer of some limitations. First, we do not consider the financial firms (e.g., banks) that have been involved in several unethical behaviors in the last years. Secondly, even if we use a fixed effects model, as an additional model, and we find unchanged results, we do not include in our analyses the corporate governance indicators.

Future research in this area could extend the role of religiosity and his impact on bankruptcy, financial irregularities, earnings management, for Italian listed firms and other Catholic religious countries. Furthermore, future research could also investigate the relationship between religiosity and corporate risk-taking using other risk proxies, as well as the z-score and standard deviation of return on assets. We also believe that all unresolved issues around the relationship between religiosity and corporate risk-taking could be examined using the crisis post Covid-19 as an exogenous shock.

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