



Religious beliefs and local government financing, investment, and cash holding decisions☆



Yangyang Chen ^{a,*}, Zoltan Murgulov ^b, S. Ghon Rhee ^c, Madhu Veeraraghavan ^d

^a School of Accounting and Finance, The Hong Kong Polytechnic University, Hong Kong

^b Department of Banking and Finance, Monash Business School, Monash University, Australia

^c Shidler College of Business, University of Hawaii, United States

^d Accounting, Economics and Finance Area, T.A. Pai Management Institute, India

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ABSTRACT

This paper is the first to examine the association between religious beliefs and the local government financing, investment and cash holding decisions. Using a sample of 15,204 county-year observations for census years between 1992 and 2012, we show that the degree of religiosity is negatively associated with the level of local government debt and investments while it is positively associated with accumulated cash holdings. Our results indicate that local governments in counties with a higher degree of religiosity are more conservatively managed. To validate the main findings we conduct a range of robustness tests and demonstrate that our main results hold.

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1. Introduction

Chen and Hungerman (2014) observe that interactions between culture, religion and economics are being increasingly studied by financial economists and that improved understanding of the interaction between religious beliefs and economic outcomes are a fruitful ground for further research. Our paper is motivated by two strands of literature. Prior studies in the first strand examine the impact of local religious beliefs on economic attitudes (Guiso et al., 2003), corporate decisions (Hilary and Hui, 2009), investor portfolio choices (Kumar et al., 2011), employee stock option based compensation (Spalt, 2013), earnings management (Grullon et al., 2010), mutual fund risk-taking (Shu et al., 2012), and corporate information disclosure (McGuire et al., 2012; Callen and Fang, 2015).

Studies in the second strand focus on agency problems in nonprofit organizations (Core et al., 2006) and in the municipal government sector (Gore et al., 2012), GAAP requirements and municipal borrowing costs (Baber and Gore, 2008), nature and extent of municipal cash holdings (Gore, 2009), financial restatements in municipal debt markets (Baber et al., 2013), and the effect of quality of local government on the level of corporate cash holdings (Chen et al., 2014). Nevertheless, none of the prior studies have explored the behavioral and religious aspects in local government decision making. We make the first attempt to fill the

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* Corresponding author at: M743, Li Ka Shing Tower, The Hong Kong Polytechnic University, Kowloon, Hong Kong.

E-mail addresses: yangyang.chen@polyu.edu.hk (Y. Chen), zoltan.murgulov@monash.edu (Z. Murgulov), rheesg@hawaii.edu (S.G. Rhee), Madhuveeraraghavan@tapmi.edu.in (M. Veeraraghavan).

void by investigating the association between religious beliefs and local government financing, investment, and cash holding decisions in the United States.¹

Examining core managerial decisions in local governments is important as they are an integral part of the overall economy and are different from the corporate sector. We are interested in the local government setting for the following reasons. First, in the seven years to December 2015, debt levels for the state and local governments have increased by 18.9% and 22.8% respectively (USDebtClock.org). Furthermore, 51 municipalities filed for Chapter 9 bankruptcy protection between January 2010 and August 2015 and the U.S. Government Accountability Office (GAO) forecasts that state and local governments face growing operating deficits each fiscal year over the next several decades.² Since the start of the financial crisis in 2008, the most prevalent reason for a local government bankruptcy was the inability to continue servicing debts, often as a result of declining tax intakes and increasing expenses.

Second, local governments represent an important part of the overall U.S. economy. For example, the total size of the local government revenue was approximately 40% of the size of the Federal Government revenue in 2007.³ Furthermore, local government spending was approximately \$1.5 trillion in 2007, being roughly 10.6% of the GDP. Local governments also hold substantial liquidity reserves. For example, holdings of cash and liquid securities by local governments were at \$1.54 trillion in total in 2007, with the average cash holdings representing 46.6% of revenue ([U.S. Census Bureau, 2007](http://U.S.CensusBureau.gov)).

Third, the governmental setting is different from the corporate sector in that local governments are non-profit organizations but also have the ability to raise revenue from their citizens directly through taxes ([Gore, 2009](http://Gore.2009)). Furthermore, local governments issuing debt securities are given a preferential tax treatment due to the interest on municipal bonds received by investors generally being exempt from federal taxes ([Gore, 2009](http://Gore.2009); [Sammartino, 2012](http://Sammartino.2012)). Therefore, it is important to know whether the findings from the corporate setting apply to the government setting. Prior literature shows that religious beliefs have significant influence on governmental organizations. For example, [Stulz and Williamson \(2003\)](http://Stulz.and.Williamson.2003) document that religion is an important predictor of how countries enforce investor and creditor rights by focusing on cross-country comparisons rather than government management. Our paper is the first to investigate the effect of the level of religiosity within a local government area on investments, financing and cash holdings decisions by that local government. We demonstrate that religiosity matters in the financial decisions made by local governments.

Recent research indicates that religion influences risk attitudes of individuals and that religious individuals tend to be more risk-averse ([Renneboog and Spaenjers, 2012](http://Renneboog.and.Spaenjers.2012); [Noussair et al., 2013](http://Noussair.et.al.2013)). A number of recent studies also find that religion has significant influence on corporate risk-taking, in that higher degree of religiosity is associated with more risk-aversion in corporate decision making ([Hilary and Hui, 2009](http://Hilary.and.Hui.2009); [Shu et al., 2012](http://Shu.et.al.2012)).

Our hypotheses are grounded in the argument that increased religiosity should manifest in risk-averse behavior at local government level, which results in more conservative government decision making. More specifically, we ask the following research question: how does the degree of religiosity affect local government debt financing, capital expenditure, and cash holdings decisions?

Using a sample of 15,204 county-year observations for census years 1992, 1997, 2002, 2007 and 2012, we demonstrate that the degree of religiosity is negatively associated with local government debt financing and investment decisions. We also find that local governments with a higher degree of religiosity have greater cash holdings. We conduct an extensive range of robustness tests, including year-by-year regression, subsample regressions, tests for the omitted variable problem and reverse causality, and tests on alternative samples. Our main findings hold.

Our paper contributes to the religion and local government entities literature. In particular, two previous studies ([Gore, 2009](http://Gore.2009); [Hilary and Hui, 2009](http://Hilary.and.Hui.2009)) are related to ours. [Gore \(2009\)](http://Gore.2009) examines the determinants of municipal cash holdings and the implications for holding high levels of cash. In particular, she documents that governments with relatively high variation in revenues, fewer sources of revenues and higher growth are more likely to accumulate cash. [Hilary and Hui \(2009\)](http://Hilary.and.Hui.2009) examine the influence of religiosity on corporate decision making and show that firms located in counties with high levels of religiosity exhibit lower risk exposure. Our study differs from the above studies in the following aspects. The focus of [Gore \(2009\)](http://Gore.2009) is on examining the determinants of municipal cash holdings, whilst we investigate the association between religious beliefs and local government financing, investment and cash holding decisions. Our study not only examines a broader set of government decisions but also focuses on the cultural factors in government decision making. [Hilary and Hui \(2009\)](http://Hilary.and.Hui.2009) examine if the level of religiosity in a firms' environment affects its corporate behavior and investment decisions, whilst we investigate the effect of local religious beliefs on decision making at the local government level.

Our findings suggest that the risk aversion induced by religious beliefs affects decision making at the government level. Therefore, our findings should be of interest not only to local government decision makers and other local government stakeholders, but also to a broader investment community including, but not limited to, municipal bond buyers and possibly credit ratings agencies.

¹ We define degree of religiosity as the number of religious adherents divided by the total population of the county. Religious adherents are defined as "All full members, their children, and others who regularly attend services or participate in the congregation" (source: Association of Religion Data Archives). We acknowledge that our definition of religiosity potentially exclude individuals who nominally proclaim religiosity but do not regularly attend religious services or participate in the congregation.

² "Governing the states and localities data" (article date 12/03/2013), which is available at: <http://www.governing.com/gov-data/municipal-cities-counties-bankruptcies-and-defaults.html>.

³ "Government Revenue Details", available at: http://www.usgovernmentrevenue.com/yearrev2007_0.html (information accessed November 18, 2014).

The rest of the paper is structured as follows. In Section 2, we discuss the relevant literature and develop the testable hypotheses. We describe the data and methodology in Section 3. Section 4 presents the empirical findings. Section 5 presents the robustness checks and Section 6 concludes.

2. Relevant literature and hypotheses

Adam Smith (1776) in *Wealth of Nations* examines the interaction between religion and economic outcomes and notes that religion is congruent with competitive markets where individual participation in a religion may be viewed as a rational outcome for individuals to enhance the value of their human capital (Anderson, 1988). In his seminal work, Weber (1930) states that the Calvinist Protestant work ethic is at the core of the development of capitalism.⁴ Calvinist Protestants across the northwestern part of Europe engaged in entrepreneurship and commerce and accumulated capital, which was predominantly re-invested into the productive economy outside of agriculture or real estate. Thus, it is not surprising that many of the behavioral guidelines and norms in modern societies are grounded in religion (Laurin et al., 2012).

Recent research indicates that religion influences risk attitudes. For example, Renneboog and Spaenjers (2012) find that religious households are more likely to save and are more risk-averse than non-religious households. Similarly, Noussair et al. (2013) find that religious individuals are more averse to financial risk exposures. Prior research in psychology shows that the characteristics of individuals affect organizational behavior (Vroom, 1966; Tom, 1971; Schneider, 1987). Religion shapes and influences individuals' beliefs, values and behavior and therefore influences risk preferences and investment attitudes of organizations (Iannaccone, 1998; Shu et al., 2012). Using a sample of 57 countries, Elgin et al. (2013) construct a theoretical proof that religiosity is negatively correlated with government spending and also empirically demonstrate that religious individuals prefer lower levels of taxation and government spending (i.e. higher religious concentration populations prefer smaller governments).

A number of recent studies find that religion has a significant influence on the risk-taking and ethical behavior in corporate decision making. Hilary and Hui (2009) find that firms incorporated in counties with a higher level of religiosity take on less investment risk exposure, but also display lower variation in returns on equity and in returns on assets. Shu et al. (2012) find that local religious beliefs have significant effect on mutual funds risk-taking. Furthermore, Dyreng et al. (2012) and McGuire et al. (2012) find that companies in counties with a higher level of religious adherence are less likely to misrepresent the financial situation of the company or engage in tax-avoidance behavior. Companies and individual tax payers domiciled in counties with a higher level of religiosity are less likely to engage in tax avoidance (Boone et al., 2013), while companies are also comparatively less likely to delay releasing negative information, which reduces the likelihood of stock price crashes (Callen and Fang, 2015).

Based on prior literature that religious individuals are more risk-averse, we formulate our testable hypotheses linking religiosity with local government debt, capital expenditure and cash holdings. Our hypotheses are built on the argument that increased religiosity should manifest in more conservative or risk-averse decision making behavior at the local government level. This is based on two principles. First, existing research indicates that religiosity is related to risk-taking attitudes and that religious individuals tend to be more risk-averse (Renneboog and Spaenjers, 2012; Noussair et al., 2013). Second, risk-attitudes of individuals are also apparent at the organizational level where greater religiosity results in organizations being managed in a relatively more risk-averse manner (Hilary and Hui, 2009; Shu et al., 2012). It is then plausible to expect that religiosity affects decision making at government level, where increased religiosity reduces the extent of risk-taking by local governments. This is supported by Autiero and Vinci (2010) and Elgin et al. (2013) models where religiosity affects government decisions, that, in turn, affect investing decisions of individuals (Autiero and Vinci, 2010). Elgin et al. (2013) find that religiosity is negatively related to government spending and that religious individuals prefer lower levels of taxation, thus allowing religious individuals to make their own decisions on donations and private transfers of funds.

Prior studies (Gore, 2009; Graham et al., 2015) show that borrowing costs are relatively low for governments because government bonds have significantly lower default risk compared to corporate issued alternatives and interest payments received on municipal bonds are generally tax-free. These factors imply that a local government would be able to sustain a relatively large debt burden. Nevertheless, recent local government bankruptcies in the United States suggest that the borrowing capacity of local governments is not unlimited. High leverage ratio raises substantial financial risk for local governments. Given the positive relation between religiosity and risk aversion, we expect local governments in high religiosity counties to be managed more conservatively, which results in lower debt level. This discussion leads to our first hypothesis.

Hypothesis 1. The degree of religiosity within a county population is negatively related to local government debt level.

Rupasingha and Chilton (2009) find that religion has a significant impact on county level economic growth in the U.S., where adherent rates for Mainline Protestants (Catholics) has significant and negative (positive) relationship with county-level per capita personal income growth. Because capital investments are generally large and last for a long period, they are deemed to be risky and are more likely to be downsized or shelved prior to any funding shortfall materializing for a local government. McCarty and Schmidt (1997) show that state government spending has increased substantially since 1984, which results in the diminished ability of governments to fund capital expenditure. Buettner and Wildasin (2006) confirm that a large proportion of the adjustment to fiscal imbalances in local governments in recent years is through reducing capital expenditure. Gore

⁴ For recent discussions and evidence on the existence of the Protestant work ethic see, for example, Iannaccone (1998), Guiso et al. (2003), Barro and McCleary (2003), van Hoorn and Maseland (2013).

(2009) documents that local governments experiencing relatively more risky cash inflows and higher population growth tend to invest less in new projects. Autiero and Vinci (2010) predict that the level of religiosity would affect government allocation of resources to religious purposes; in turn, this would have an indirect effect on decisions of individual workers, entrepreneurs and firms when deciding about investing in human and physical capital. Since high religiosity is associated with greater risk-aversion in a local population, we expect a more conservative approach in local government management for high religiosity counties, which results in their lower level of capital expenditure. This discussion leads to our second hypothesis.

Hypothesis 2. The degree of religiosity within a county population is negatively related to local government capital expenditure.

Chen et al. (2014) examine the effect of local government quality on corporate cash holdings in China. They find that local government willingness to protect property rights (for example, by effectively enforcing corporate and contract laws) results in local corporations holding lower cash levels. Gore (2009) examines the level of cash holdings of municipal governments across the United States and finds that municipal authorities with more risky cash flows (i.e., those with fewer sources of revenue and more unpredictable revenues) are likely to hold higher levels of cash. This is consistent with Fisman and Hubbard (2005) who report that managers of non-profit organizations hold cash to reduce the risk of volatile future cash inflows. Baber and Gore (2008) find that the municipal governments' cost of debt funding decreases in states that adopt Generally Accepted Accounting Practices (GAAP). This enables them to hold proportionally less cash as the precautionary demand for cash is reduced.⁵ Accumulation of adequate cash reserves over the economic cycle would be considered by local governments as less risky financial management strategy. Thus, given a predominant attitude of religious populations towards risk, we hypothesize that greater religious concentration within a local government population is associated with greater cash reserves held by the local government. This discussion leads to our third hypothesis.

Hypothesis 3. The degree of religiosity within a county population is positively related to local government cash holdings.

3. Data and methodology

We obtain the data for government financing from the U.S. Census Bureau's Annual Survey of State and Local Government Finances.⁶ The Census Bureau collects data on local governmental financial activities by conducting a census on all local governments quinquennially (in years ending in '2' and '7') and an annual survey on a small sample of local governments in the intervening years. This census is required by law under Title 13, U.S. Code, Section 161. Our analysis is performed on a sample that aggregates government financial data items for all levels of local governments (i.e., county, municipal, township, special district, and school district governments) within each geographical county area.⁷ The data for the sample are available only for census years 1992, 1997, 2002, 2007 and 2012. There are at least three benefits to using the county-level sample. First, the sample is comprehensive and covers all counties for the census years. Second, the sample covers data for all levels of local government entities within a county and thus offers a complete picture of local government financial activities. Third, the sample achieves the best match with our religion data, which are at the county-level.

Data from the Annual Surveys of State and Local Government Finances cover governmental revenue by source, expenditure by character and function, indebtedness by term, and cash and security holdings by purpose. Our measure of local government financing is the debt ratio (*DEBT*) defined as the ratio of net long-term debt to total revenue. Our measure of local government investment is capital expenditure (*CAPX*), defined as the ratio of total capital outlay to total revenue. Our measure of cash holdings (*CASH*) is defined as the ratio of cash holdings to total revenue.⁸ We also use three control variables from the same data. Government size (*SIZE*) is measured by total revenue (in billions of U.S. dollars) and is used to control for the size of the local government. Government expenses (*EXP*) is defined as the ratio of operating expenses to total revenue and is used to control for the financial conditions of local governments. Tax income (*TAX*) is defined as the ratio of tax income to total revenue and is used to control for the effect of tax income on government financial policies.

We obtain data on religiosity and religious composition from the Churches and Church Membership files of the Association of Religion Data Archives (ARDA).⁹ The data are published by the Glenmary Research Center and contain statistics by county for 133 church bodies as well as information on their number of churches and members. The U.S. Churches and Church Membership data on religiosity at the county level are available for five years (1971, 1980, 1990, 2000 and 2010). We use the 1990 data for census years 1992 and 1997, the 2000 data for census years 2002 and 2007, and the 2010 data for census year 2012. Our main variable of interest is the degree of religiosity (*REL*), defined as the number of religious adherents in the county divided by the total

⁵ Governmental Accounting Standards Board (GASB) sets generally accepted accounting practices for local governments. GASB was established in 1984 to enable standardized accounting and reporting procedures specifically applicable to state and local governments (Baber and Gore, 2008). By year 2000, 15 states required their municipalities to file annual financial statements using GAAP as established by the GASB (Baber and Gore, 2008). GASB reporting requirements for local and state governments are frequently updated to improve transparency of local and state government finances.

⁶ The data are downloaded from the U.S. Census Bureau's website at <http://www.census.gov/govs>.

⁷ County governments are found throughout the nation except in Connecticut, Rhode Island, the District of Columbia and other states where geographical county areas lack a distinct county government. The sample aggregates financial data items of other local governments available (e.g., city and town) for these geographical county areas.

⁸ In unreported tests, we also scale local government debt, capital expenditure, and cash holdings by total expenses of the governments, and our results hold.

⁹ The data are downloaded from the ARDA website at <http://www.thearda.com/Archive/ChCounty.asp>. Religiosity data obtained from the ARDA database have been used in several recent studies which examine the effects of religiosity (Hilary and Hui, 2009; Callen and Fang, 2015; Jiang et al., 2013).

population of the county. ARDA defines religious adherents as “all full members, their children, and others who regularly attend services or participate in the congregation”. We recognize that in addition to registered adherents, some non-registered individuals may nominally proclaim religiosity but do not regularly attend religious services or participate in the congregation as recorded by ARDA. This would indicate that ARDA data potentially underestimates the proportion of individuals generally guided in their decisions by the religious principles. We acknowledge these issues as limitations of data available to us and their impact on our findings.

We control for several county-level demographic variables compiled from the U.S. Census Bureau data, because religiosity has a close relation with the demographic characteristics of the population which might also affect local government policies. Population (*POP*) is defined as the total population of the county. Education (*EDU*) is defined as the proportion of county population above age 25 that has completed a bachelor's degree or higher. Male-female ratio (*MF*) is the ratio of the number of male residents over the number of female residents.¹⁰ Marriage (*MRAG*) is the proportion of households in the county with a married couple. Minority (*MIN*) is the proportion of county population that is non-white. Resident age (*AGE*) is the median age of the county population. Urbanization (*URBAN*) is the proportion of county residents who live in urban areas.¹¹ Since political values of the county population are likely to affect the choice of local government policies, we control for political preferences (*PLT*) in the regression, which is defined as the number of county residents who vote for the Democratic Party in the presidential election scaled by those who vote for either the Democratic Party or the Republican Party.¹²

We begin constructing our sample with 15,700 county-year observations (3140 for each census year). We lose a total of 496 county-year observations in the merging process. The final sample on which we perform our analysis consists of 15,204 county-year observations for census years 1992, 1997, 2002, 2007 and 2012. Fig. 1 presents the geographic distribution of religiosity among the counties in year 2000. The graph shows that the Northeast, Midwest, South, and Southwest regions exhibit relatively high religiosity, while the West and Southeast regions exhibit relatively low religiosity. Overall, the graph demonstrates wide variation of religiosity within the United States.

We present the summary statistics in Table 1. This table shows that, on average, counties borrow net long-term debt of 22.3% of their total annual revenue. On average, counties spend 9.4% of their total revenue on capital outlays and hold cash that is 33.5% of the total revenue. Average revenue generated by local governments is \$0.283 billion and the average operating expense to revenue ratio is 0.802. Further, 55.2% of the population is religious adherence. Average county population is 84,000 while the average resident age is 36.8 years. On average, 9.9% of the population over the age of 25 hold a bachelor's degree or higher and married couples (with or without children) represent 57% of the households. We also report that, on average, 38% of the population lives in urban areas, average male-to-female ratio is 98%, average proportion of minority population (non-white) is 14.3% and the average proportion of votes for the Democratic Party is 43.5%.

Table 2 presents the sample correlations of the variables. The table shows that governments in counties with a higher degree of religiosity borrow less, spend less via capital expenditures and hold more cash in their accounts. These findings are consistent with our hypotheses at the univariate level.

4. Empirical results

4.1. Main results

In this section, we conduct multivariate regression analysis on the relation between local government financing, investment, cash holdings, and degree of religiosity. The regression specification is as follows:

$$DEBT_{i,t} = \beta_0 + \beta_1 REL_{i,t} + \beta_2 POP_{i,t} + \beta_3 AGE_{i,t} + \beta_4 EDU_{i,t} + \beta_5 MARG_{i,t} + \beta_6 URBAN_{i,t} + \beta_7 MF_{i,t} + \beta_8 MIN_{i,t} + \beta_9 PLT_{i,t} + \beta_{10} SIZE_{i,t} + \beta_{11} EXP_{i,t} + \beta_{12} TAX_{i,t} + Yr_t + \varepsilon_{i,t} \quad (1)$$

$$CAPX_{i,t} = \beta_0 + \beta_1 REL_{i,t} + \beta_2 POP_{i,t} + \beta_3 AGE_{i,t} + \beta_4 EDU_{i,t} + \beta_5 MARG_{i,t} + \beta_6 URBAN_{i,t} + \beta_7 MF_{i,t} + \beta_8 MIN_{i,t} + \beta_9 PLT_{i,t} + \beta_{10} SIZE_{i,t} + \beta_{11} EXP_{i,t} + \beta_{12} TAX_{i,t} + Yr_t + \varepsilon_{i,t} \quad (2)$$

$$CASH_{i,t} = \beta_0 + \beta_1 REL_{i,t} + \beta_2 POP_{i,t} + \beta_3 AGE_{i,t} + \beta_4 EDU_{i,t} + \beta_5 MARG_{i,t} + \beta_6 URBAN_{i,t} + \beta_7 MF_{i,t} + \beta_8 MIN_{i,t} + \beta_9 PLT_{i,t} + \beta_{10} SIZE_{i,t} + \beta_{11} EXP_{i,t} + \beta_{12} TAX_{i,t} + Yr_t + \varepsilon_{i,t} \quad (3)$$

where *i* denotes county, *t* denotes year, and ε is the error term. Appendix A defines all the variables introduced in the above three equations. Year fixed-effects *Yr* are included when the regression is conducted on the pooled sample.¹³ The regressions are performed by ordinary least squares (OLS). The *t*-statistics are computed using standard errors robust to both heteroskedasticity

¹⁰ Miller and Hoffmann (1995) argue that gender differences in risk preferences are related to religiosity as females tend to be more religious and more risk-averse.

¹¹ We also have data for average household income for the county. However, the variable is highly correlated with *EDU* (correlation = 0.659), and thus, following Kumar et al. (2011), we exclude it from the analysis. In untabulated results, our findings remain largely the same with this variable included.

¹² The county level election data are available since 1980 and can be downloaded from <http://www2.census.gov/prod2/statcomp/usac/excel/ELE01.xls>.

¹³ We are unable to add state fixed-effects as religiosity exhibits geographic clustering, as shown in Fig. 1. If included, state fixed-effects capture the effect of the religiosity ratio in the regression.

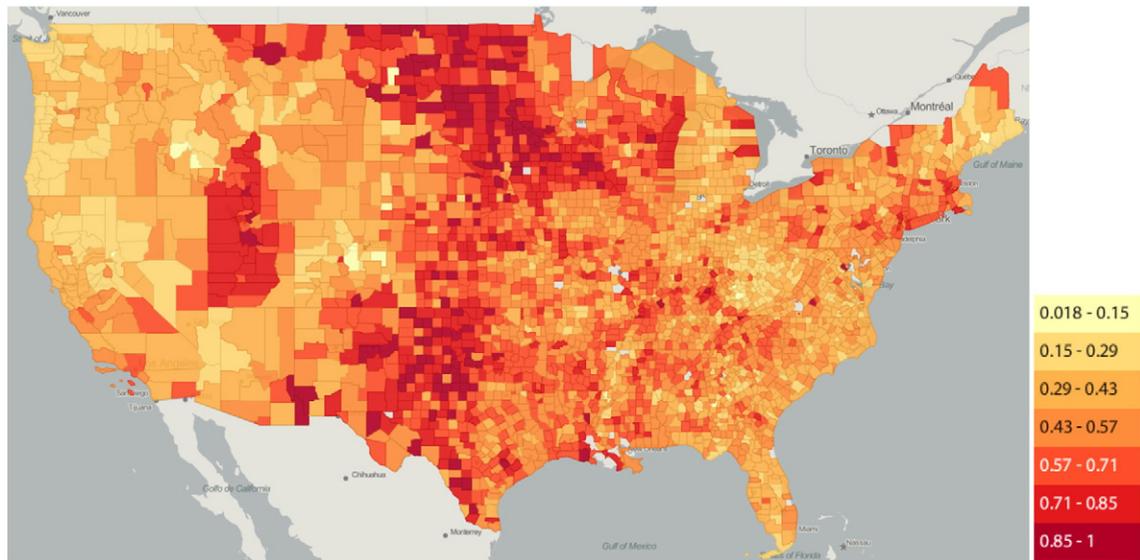


Fig. 1. County-level religiosity across the United States Notes: This figure presents the county-level religiosity across the United States for year 2000. In this figure, darker shades represent more religious counties. We obtain data on religiosity and religious composition from the Churches and Church Membership files of the Association of Religion Data Archives (ARDA). The data are published by the Glenmary Research Center and contain statistics by county for 133 Judeo-Christian church bodies, providing information on their number of churches and members. The U.S. Churches and Church Membership data on religiosity at the county level are available for three years [1990, 2000, and 2010] during our sample period. We upload county-level religiosity data to the spatial key website to create this map.

and clustering at the county-level. Regression results are presented in Table 3. Column (1) of Table 3 presents the results for Eq. (1), in which local government debt ratio is regressed on the degree of religiosity. The coefficient of the religiosity ratio is negative and statistically significant at the 1% level. This finding is consistent with our first hypothesis. The magnitude of the coefficient shows that a one-standard-deviation increase in the religiosity ratio results in a decrease in local government debt by 0.013. For a typical county with local government debt equal to the sample mean (0.223), this constitutes a 5.79% decrease, indicating that the effect of religiosity on local government debt is not only statistically significant but also economically significant. With respect to the control variables, our results show that local government debt is positively associated with education, marriage, urbanization, government size, government expenses, and political preferences, while it is negatively associated with resident age. There is no significant association between local government debt and population, male-to-female ratio, or proportion of minority population.

Table 1
Summary statistics.

Variable	Mean	S.D.	25%	Median	75%
DEBT	0.223	0.285	0.000	0.118	0.357
CAPX	0.094	0.075	0.039	0.083	0.133
CASH	0.335	0.220	0.142	0.290	0.433
REL	0.552	0.187	0.412	0.540	0.682
POP	0.084	0.279	0.011	0.024	0.058
AGE	36.822	4.642	33.800	36.600	39.600
EDU	0.099	0.048	0.067	0.087	0.116
MARG	0.570	0.068	0.530	0.576	0.617
URBAN	0.380	0.301	0.048	0.369	0.608
MF	0.980	0.085	0.938	0.967	0.998
MIN	0.143	0.159	0.027	0.077	0.216
PLT	0.435	0.127	0.347	0.436	0.524
SIZE	0.283	0.862	0.036	0.100	0.229
EXP	0.802	0.378	0.869	0.964	1.016
TAX	0.253	0.163	0.147	0.255	0.360
Obs.	15,204				

Notes: This table presents the mean, standard deviation (S.D.), 25th-percentile (25%), median, and 75th-percentile (75%) for each variable. We obtain local government finance data from the Census of Governments conducted by the U.S. Census Bureau on all local government organizational units in 1992, 1997, 2002, 2007 and 2012. The Census of Governments is conducted in years ending in '2' and '7'. Data are available as aggregates for counties, municipalities, towns, special districts, and school districts. We merge the local government finance data with religiosity data obtained from the Association of Religion Data Archives (ARDA). All variables are winsorized at both the upper and lower one-percentile to reduce the effect of extreme observations. Variable definitions are presented in Appendix A.

Table 2
Correlation matrix.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) DEBT	1.000														
(2) CAPX	0.408	1.000													
(3) CASH	0.298	0.555	1.000												
(4) REL	0.001	−0.022	0.061	1.000											
(5) POP	0.117	0.070	0.036	−0.060	1.000										
(6) AGE	−0.268	−0.238	−0.152	−0.018	−0.118	1.000									
(7) EDU	0.096	0.114	0.137	−0.149	0.296	0.040	1.000								
(8) MARG	0.162	0.195	0.208	0.153	−0.176	−0.083	−0.229	1.000							
(9) URBAN	0.158	0.080	0.059	−0.052	0.383	−0.332	0.462	−0.309	1.000						
(10) MF	−0.071	−0.022	0.002	−0.203	−0.058	0.003	0.001	0.064	−0.110	1.000					
(11) MIN	−0.050	−0.063	−0.075	0.000	0.151	−0.305	−0.041	−0.552	0.172	−0.035	1.000				
(12) PLT	0.199	0.055	−0.076	−0.061	0.153	−0.254	−0.011	−0.278	0.148	−0.181	0.300	1.000			
(13) SIZE	0.152	0.253	0.281	−0.095	0.343	0.056	0.254	−0.252	0.274	−0.006	0.107	0.057	1.000		
(14) EXP	0.406	0.664	0.639	0.096	−0.005	−0.374	−0.075	0.353	−0.019	−0.128	−0.062	0.166	−0.442	1.000	
(15) TAX	0.290	0.463	0.554	0.077	0.043	−0.219	0.180	0.357	0.035	−0.074	−0.144	0.035	−0.318	0.696	1.000

Notes: This table presents the Spearman correlation matrix between the variables used in the regressions. We obtain local government finance data from the Census of Governments conducted by the U.S. Census Bureau on all local government organizational units in 1992, 1997, 2002, 2007 and 2012. The Census of Governments is conducted in years ending in '2' and '7'. Data are available as aggregates for counties, municipalities, towns, special districts, and school districts. We merge the local government finance data with religiosity data obtained from the Association of Religion Data Archives (ARDA). All variables are winsorized at both the upper and lower one-percentile to reduce the effect of extreme observations. Variable definitions are presented in [Appendix A](#).

Column (2) presents the results for Eq. (2), in which local government capital expenditures is regressed on religiosity. This column shows that the religiosity ratio is negatively and significantly related to local government capital expenditures. This finding supports our second hypothesis. The coefficient of the religiosity ratio shows that a one-standard-deviation increase in religiosity ratio results in a decrease in local government capital expenditures by 0.004. For a typical county with local government

Table 3
Religiosity and local government decision making.

Dependent variable	DEBT	CAPX	CASH
	(1)	(2)	(3)
REL	−0.069 (−5.579)***	−0.019 (−5.953)***	0.055 (4.934)***
POP	0.069 (2.400)**	0.006 (2.059)**	0.014 (1.971)**
AGE	−0.002 (−2.977)***	−0.000 (−2.816)***	0.001 (2.065)**
EDU	0.697 (10.580)***	0.182 (10.206)***	0.469 (8.184)***
MARG	0.134 (2.208)**	0.051 (3.478)***	0.095 (1.976)**
URBAN	0.111 (9.508)***	0.008 (2.878)***	0.030 (3.377)***
MF	0.023 (0.809)	0.034 (4.124)***	0.150 (5.638)***
MIN	−0.063 (−3.264)***	−0.010 (−2.017)**	0.019 (1.156)
PLT	0.072 (3.140)***	−0.007 (−1.288)	−0.142 (−7.307)***
SIZE	0.023 (3.134)***	0.008 (2.746)***	0.014 (2.876)***
EXP	0.350 (13.225)***	0.335 (31.023)***	0.227 (11.319)***
TAX	−0.054 (−2.220)**	0.001 (0.191)	0.213 (9.658)***
Obs.	15,204	15,204	15,204
Adj. R ²	0.538	0.556	0.545

Notes: This table presents the main regression results of local government debt (DEBT), capital expenditure (CAPX), and cash holdings (CASH) against the degree of religiosity (REL). The regression is performed by ordinary least squares (OLS). The t-statistics (in parentheses) are computed using standard errors robust to both clustering at the firm level and heteroskedasticity. Constant term is included but not reported. We obtain the local government finance data from the Census of Governments conducted by the U.S. Census Bureau on all local government organizational units in 1992, 1997, 2002, 2007 and 2012. The Census of Governments is conducted in years ending in '2' and '7'. Data are available as aggregates for counties, municipalities, towns, special districts, and school districts. We merge the local government finance data with religiosity data obtained from the Association of Religion Data Archives (ARDA). All variables are winsorized at both the upper and lower one-percentile to reduce the effect of extreme observations. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Variable definitions are presented in [Appendix A](#).

capital expenditures equal to the sample mean (0.094), this constitutes a 3.78% decrease. Results for the control variables show that local government capital expenditures are positively associated with education, marriage, male-to-female ratio, government size, and government expenses, while they are negatively associated with resident age and political preferences. There is no significant association between local government capital expenditures and population, urbanization, or proportion of minority population.

In column (3), we report the results for Eq. (3), where local government cash holdings are regressed on religiosity. This column shows that the coefficient of the religiosity ratio is positive and statistically significant at the 1% level, suggesting that a higher religiosity ratio is associated with higher local government cash holdings. This finding supports our third hypothesis. Our results are also economically significant. We show that a one-standard-deviation increase in the religiosity ratio results in an increase in local government cash holdings of 0.01. For a typical county with local government cash holdings equal to the sample mean (0.335), this constitutes a 3.07% increase. With respect to the control variables, we show that local government cash holdings are positively associated with resident age, education, marriage, urbanization, male-to-female ratio, and government expenses, while cash holdings are negatively associated with political preferences. There is no significant association with population, proportion of minority population, or government size. Taken together, the results are consistent with our conjecture that a higher proportion of religious residents in a county are correlated with less risk-taking by local governments within the county, which results in lower local government debt and capital expenditures and higher local government cash holdings.

4.2. Decomposing religion into groups

We partition the religious population into Protestant, Catholic and other religions. Because Protestants and Catholics are the two major religious groups in the United States, we separate them into independent groups, while other religions form the third group. We define Protestant ratio (PROT), Catholic ratio (CATH), and other religions ratio (OTH) as the number of corresponding religious adherents in a county to the total population in the county.¹⁴ We replace the religiosity ratio with ratios of these three groups and present the results in columns (1) through (3) of Table 4. The columns show that the Protestant ratio and the Catholic ratio are negatively and significantly related to local government debt, while there is no significant relation between the other religions ratio and local government debt. We document similar findings for local government capital expenditures, and we find that all three ratios are positively and significantly associated with local government cash holdings.¹⁵ Overall, the results suggest that the two major types of religious groups, Protestants and Catholics, have similar effects on financing, investment and cash holding policies of local governments. Taken together, the level of overall religiosity is more important than the decomposition of religious adherents.

5. Robustness checks

5.1. Alternative definition of religiosity

In our main analysis, we define religious population as religious adherents. As an alternative definition, we define religiosity as the proportion of full church members in the county, calculated as the number of full church members in a county divided by the total population in the county. Church members might have stronger religious beliefs as they are core part of organized religions. We present the results of the alternative definition in Panel A of Table 5. For the sake of brevity, we only report the coefficient of the religiosity ratio. The results show that the coefficient of religiosity ratio is negative and significant in debt ratio and capital expenditure regressions, while positive and significant in cash holding regression. The results are largely consistent with our main definition of religiosity and suggest that our findings are not sensitive to alternative definitions of religiosity.

5.2. Year-by-year regressions

In the main analysis, we perform the regression on the pooled sample (i.e., pool of census years 1992, 1997, 2002, 2007 and 2012). In this section, we perform cross-sectional regression for each census year. The results are presented in Panel B of Table 5. For the sake of brevity, we only report the coefficient of the religiosity ratio. The panel shows that the coefficient of religiosity ratio is negative and significant for census years 1992, 1997, 2002 and 2012 in debt ratio regressions. The coefficient for census year 2007 is insignificant, though the sign is negative. We also show that, for all five census years, the coefficient of religiosity ratio is negative and significant in the capital expenditure regressions, while positive and significant in cash holdings regressions. Overall, the results suggest that our findings in the pooled regressions hold in cross-sectional regressions.

¹⁴ As a robustness check, we drop counties in Utah from the analysis as Utah has a large population of Mormons, who are classified by ARDA as 'other religion'. The results are not reported but remain largely the same.

¹⁵ To further explore this issue, we follow Kumar et al. (2011) and define the Catholic-to-Protestant ratio as the number of Catholic adherents divided by the number of Protestant adherents in a county. In unreported tests, we include both the Catholic-to-Protestant and the religiosity ratios in the regression. The results show that the Catholic-to-Protestant ratio is insignificant, while the religiosity ratio retains its sign and statistical significance in all three regressions.

Table 4
Decomposition of religion.

Dependent variable	DEBT	CAPX	CASH
	(1)	(2)	(3)
PROT	−0.061 (−4.208)***	−0.021 (−5.616)***	0.029 (2.191)**
CATH	−0.087 (−5.486)***	−0.018 (−4.263)***	0.101 (6.901)***
OTH	−0.002 (−0.049)	0.001 (0.131)	0.081 (3.426)***
POP	0.067 (2.370)**	0.005 (1.861)*	0.011 (1.616)
AGE	−0.002 (−2.502)**	−0.000 (−2.152)**	0.001 (2.732)***
EDU	0.696 (10.477)***	0.177 (9.963)***	0.448 (7.741)***
MARG	0.130 (2.087)**	0.050 (3.357)***	0.078 (1.617)
URBAN	0.115 (9.870)***	0.008 (2.863)***	0.025 (2.885)***
MF	0.029 (0.969)	0.034 (3.945)***	0.132 (4.843)***
MIN	−0.071 (−3.577)***	−0.009 (−1.834)*	0.031 (1.882)*
PLT	0.087 (3.589)***	−0.006 (−1.133)	−0.166 (−8.159)***
SIZE	0.025 (3.246)***	0.010 (2.945)***	0.013 (2.785)***
EXP	0.366 (13.250)***	0.345 (31.326)***	0.220 (10.626)***
TAX	−0.041 (−1.658)*	0.004 (0.654)	0.195 (8.758)***
Obs.	15,204	15,204	15,204
Adj. R ²	0.537	0.553	0.539

Notes: This table presents the regression results of local government debt (DEBT), capital expenditure (CAPX), and cash holdings (CASH) against the degree of Protestants (PROT), Catholics (CATH), and other religions (OTH). The regression is performed by ordinary least squares (OLS). The t-statistics (in parentheses) are computed using standard errors robust to both clustering at the firm level and heteroskedasticity. Constant term is included but not reported. We obtain the local government finance data from the Census of Governments conducted by the U.S. Census Bureau on all local government organizational units in 1992, 1997, 2002, 2007 and 2012. The Census of Governments is conducted in years ending in '2' and '7'. Data are available as aggregates for counties, municipalities, towns, special districts, and school districts. We merge the local government finance data with religiosity data obtained from the Association of Religion Data Archives (ARDA). All the variables are winsorized at both the upper and lower one-percentile to reduce the effect of extreme observations. PROT is the proportion of Protestant adherents in the county. CATH is the proportion of Catholic adherents in the county. OTH is the proportion of other religious adherents in the county. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Variable definitions are presented in [Appendix A](#).

5.3. Subsample analyses

To reject a claim that our findings could be driven by geographic or demographic differences among different U.S. regions, we conduct subsample regressions by region. First, we partition counties into eastern and western regions by their geographic location and then into rural and urban counties by median population density.¹⁶ Next, we partition counties by the starting letter of their state (a random geographic partition). States starting with a letter before N are classified into one group, and those with a letter on or after N are classified into the other group. The results for the subsample regressions are presented in Panel C of [Table 5](#). Once again, we only report the coefficient of the religiosity ratio. The results show that the relation between the religiosity ratio and local government debt is negative and significant for all the subsamples. The negative relation between the religiosity ratio and local government capital expenditure holds as well, though the coefficient is insignificant for the subsample of western counties. Further, the coefficient of the religiosity ratio is positive and significant for all the subsamples. In general, the results are largely consistent with the findings as reported in [Table 3](#).

5.4. Omitted variable problem

In this subsection, we perform tests to address the concern that our results could be driven by an omitted variable problem. It is likely that the observed relation between the religiosity ratio and the three local government financing variables is driven by

¹⁶ Eastern counties include those in the following states: Alabama, Arkansas, Connecticut, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Mississippi, New Hampshire, New Jersey, New York, North Carolina, Oklahoma, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Vermont, Virginia, and West Virginia. Western counties include those in Alaska, Arizona, California, Colorado, Hawaii, Idaho, Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Montana, Nebraska, Nevada, New Mexico, North Dakota, Ohio, Oregon, South Dakota, Utah, Washington, Wisconsin, and Wyoming.

Table 5
Robustness Checks.

Dependent variable	Coefficient of REL		
	DEBT	CAPX	CASH
	(1)	(2)	(3)
Panel A. Alternative definition of religiosity			
(1) Define using full church members	−0.051 (−4.848)***	−0.012 (−4.682)***	0.042 (4.436)***
Panel B. Year-by-year regression			
(1) Year 1992	−0.051 (−2.353)**	−0.033 (−6.538)***	0.037 (2.588)***
(2) Year 1997	−0.116 (−4.550)***	−0.011 (−1.843)*	0.072 (4.149)***
(3) Year 2002	−0.091 (−3.363)***	−0.023 (−3.472)***	0.083 (4.268)***
(4) Year 2007	−0.002 (−0.746)	−0.018 (−2.706)***	0.060 (2.772)***
(5) Year 2012	−0.041 (−1.768)*	−0.012 (−2.095)**	0.028 (2.704)***
Panel C. Subsample regression by region			
(1) Eastern counties	−0.121 (−4.976)***	−0.040 (−7.077)***	0.066 (3.738)***
(2) Western counties	−0.034 (−1.853)*	−0.004 (−0.765)	0.052 (2.928)***
(3) Rural counties	−0.021 (−2.459)**	−0.008 (−1.905)*	0.061 (3.894)***
(4) Urban counties	−0.013 (−2.410)**	−0.028 (−5.791)***	0.025 (1.501)
(5) Counties in States starting with a letter before N	−0.077 (−5.578)***	−0.024 (−6.258)***	0.033 (2.248)**
(6) Counties in States starting with a letter on or after N	−0.054 (−2.909)***	−0.009 (−2.016)**	0.094 (5.363)***
Panel D. Omitted variable problem			
(1) Additional control variables	−0.069 (−5.233)***	−0.019 (−6.080)***	0.047 (3.777)***
(2) Random-effect panel regression	−0.026 (−2.153)**	−0.019 (−5.647)***	0.028 (2.359)**

Notes: This table presents the results for the general robustness checks. The regression is performed by ordinary least squares (OLS), except for the random-effect panel regression in Panel D. The t-statistics (in parentheses) are computed using standard errors robust to both clustering at the firm level and heteroskedasticity. Constant term is included but not reported. We obtain the local government finance data from the Census of Governments conducted by the U.S. Census Bureau on all local government organizational units in 1992, 1997, 2002, 2007 and 2012. The Census of Governments is conducted in years ending in '2' and '7'. Data are available as aggregates for counties, municipalities, towns, special districts, and school districts. We merge the local government finance data with religiosity data obtained from the Association of Religion Data Archives (ARDA). All variables are winsorized at both the upper and lower one-percentile to reduce the effect of extreme observations. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Variable definitions are presented in Appendix A.

their correlation with variables not included in our model. Even though we include several demographic and local government financing variables as controls, we cannot exclude this possibility. Therefore, we address this problem in two ways.

We include a list of variables related to culture as additional control variables for our model. Specifically, we include a dummy variable indicating the existence of a death penalty law in the state, the number of prisoner executions in the state, the percentage of the state's population that is incarcerated, the alcohol consumption rate in the state, abortion rate in the state, the log number of years the state has been part of the United States, the state's business attractiveness rank, the state's business costs rank, the state's labor supply rank, the state's regulatory environment, the state's economic climate rank, the state's growth prospects rank, and the state's quality of life rank.¹⁷

Next, we adopt the random-effect panel regression, which is estimated by a generalized least squares (GLS) model.¹⁸ In general, the random-effect estimator subtracts a fraction of the time averages from the corresponding variables where the fraction depends on the variance of the fixed-effect and the error term as well as the number of time periods. The results for additional control variables and random-effect panel regressions are presented in Panel D of Table 5. We only report the coefficient of the

¹⁷ We obtain data for these variables from the Death Penalty Information Centre at www.deathpenaltyinfo.org, the Bureau of Justice Statistics at <http://bjs.ojp.usdoj.gov/index.cfm?ty=pbdetail&iid=2061>, the National Institute on Alcohol Abuse and Alcoholism at <http://pubs.niaaa.nih.gov/publications/surveillance.htm>, and *Forbes* magazine at <http://www.forbes.com>.

¹⁸ We are unable to use a fixed-effect panel regression because we have only two years of data for the religiosity ratio. Given the persistence of religiosity over time, there is not enough variation to perform the fixed-effect test. Further, we perform a Hausman test which shows that the random-effect model has higher efficiency than fixed-effects model in our test.

religiosity ratio for the sake of brevity. The results show that the religiosity ratio continues to be negatively and significantly related to local government debt and capital expenditure and positively related to local government cash holdings. Our results are consistent with the main findings as reported in Table 3.

5.5. Reverse causality

One potential concern of our analysis is causality between the degree of religiosity and local government debt, capital expenditure, and cash holdings decisions. Even though religiosity is one of the local attributes that are mainly determined by the historical evolution of the county, it is still likely that local government policies attract people of certain faiths to live in the county over time. We use the lagged religiosity ratio in our main analysis, which mitigates this problem to a certain extent. In this section, we adopt a two-stage least squares (2SLS) approach to formally address the potential reverse causality problem. Another advantage of the approach is that it can help address the omitted variable problem if the instruments are uncorrelated with the omitted variable.

Following Hilary and Hui (2009), we adopt ten-year lagged religiosity ratio and county population as the instrumental variables (i.e., we use the 1980 religiosity ratio and county population as the instrument for the 1990 religiosity ratio, the 1990 religiosity ratio and county population as the instrument for the 2000 religiosity ratio, and the 2000 religiosity ratio and county population as the instrument for the 2010 religiosity ratio).¹⁹ Due to the inherent nature of religion, historical religiosity ratio and county population are closely related to current religiosity ratio but do not have any apparent effect on local government decision making other than through current religiosity ratio. We regress the religiosity ratio against instrumental variables in the first-stage regression and then use the predicted value of the religiosity ratio in the second-stage regression where the dependent variable is local government debt, capital expenditure, or cash holdings.

The results for the 2SLS regression are presented in Table 6. Column (1) shows that the religiosity ratio is positively and significantly associated with both lagged religiosity ratio and lagged population. The *R*-squared (0.666) and *F*-statistic (*p*-value 0.000) of the regression are both high, suggesting that the weak instrument problem does not pose a concern in our analysis. Columns (2) through (4) present the results for the second-stage regression, which shows that the fitted value of the religiosity ratio from the first stage is negatively associated with local government debt and capital expenditure and positively associated with local government cash holdings. Thus, the results for the 2SLS regression suggest that our findings are not driven by a reverse causality problem.

5.6. County and municipal government samples

In our main analysis, we conduct tests using the sample that integrates the financial information of all levels of governments (i.e., county, municipal, township, special district, and school district governments) within a geographic county. An advantage of the integrated sample is that it covers all the geographic counties in the United States and reflects the overall debt, capital expenditure, and cash holdings decisions of all levels of local governments within the geographic county area. Nevertheless, the integrated sample only has data for census years 1992, 1997, 2002, 2007 and 2012.

In this section, we perform tests on two alternative samples: (i) the county government sample; and (ii) the municipal government sample. The two samples only cover one level of local government (i.e., county and municipal governments, respectively), instead of aggregating the financial data items of different level of local governments within the geographic county. In addition to the quinquennial census on all local governments, the Census Bureau also conducts an annual survey on a small sample of local governments (mainly county and municipal governments) in the intervening years. So an advantage is that the data are available each year over the sample period 1995 to 2009, though there are significantly more observations in the census years.²⁰

The regression results for the county and municipal government samples are presented in Table 7. Columns (1) to (3) show that the religiosity ratio is negatively correlated with county government debt and capital expenditure, while positively correlated with county government cash holdings. The coefficient of religiosity ratio is statistically significant at the 1% level in all three regressions. Further, columns (4) to (6) show that the coefficient of religiosity ratio is negative and statistically significant at the 1% level in the municipal government debt and capital expenditure regressions. Although the coefficient of religiosity ratio is positive in the municipal government cash holdings regression, it is statistically insignificant. Overall, the results are consistent with those from our main analysis reported in Table 3.

6. Conclusions

This paper is the first to examine the association between religious beliefs and local government decision making. Using a sample of 15,204 county-year observations for census years spanning the period 1992 and 2012, we find that the degree of religiosity is negatively associated with local government debt and capital expenditure and positively associated with the level of

¹⁹ In unreported tests, we use the 1971 (the first year of the available religion data) religiosity ratio and county population as the instruments for the 1990, 2000 and 2010 religiosity ratio. The results are largely the same.

²⁰ For the county government sample, there are roughly 2800 observations in census years (i.e., 1997, 2002 and 2007) and 1500 observations in the intervening years. For the municipal government sample, there are roughly 17,000 observations in census years and 3000 observations in the intervening years.

Table 6
Two-stage least squares regression.

Dependent Variable	First-stage	Second-stage		
	REL	DEBT	CAPX	CASH
	(1)	(2)	(3)	(4)
Lagged-REL	0.746 (61.419)***			
Lagged-POP	0.296 (3.865)***			
Fitted-REL		−0.061 (−3.751)***	−0.026 (−6.294)***	0.037 (2.935)***
POP	−0.263 (−3.814)***	0.069 (2.366)**	0.005 (1.970)**	0.013 (1.914)*
AGE	0.001 (4.672)***	−0.002 (−2.944)***	−0.000 (−2.484)**	0.001 (2.584)***
EDU	0.036 (1.227)	0.718 (10.998)***	0.182 (10.418)***	0.462 (7.978)***
MARG	0.145 (5.527)***	0.139 (2.260)**	0.050 (3.362)***	0.107 (2.221)**
URBAN	0.025 (4.882)***	0.110 (9.288)***	0.009 (3.288)***	0.032 (3.696)***
MF	−0.177 (−9.989)***	0.026 (0.938)	0.030 (3.657)***	0.136 (5.125)***
MIN	0.075 (9.247)***	−0.063 (−3.203)***	−0.009 (−1.757)*	0.026 (1.633)
PLT	−0.091 (−7.556)***	0.077 (3.315)***	−0.009 (−1.586)	−0.149 (−7.596)***
SIZE	−0.000 (−4.577)***	0.028 (3.163)***	0.006 (2.197)**	0.015 (1.748)*
EXP	0.011 (0.871)	0.353 (13.340)***	0.335 (30.891)***	0.228 (11.343)***
TAX	−0.016 (−1.503)	−0.057 (−2.344)**	0.002 (0.305)	0.214 (9.673)***
Obs.	15,137	15,137	15,137	15,137
Adj. R ²	0.666	0.538	0.556	0.546

Notes: This table presents the two-stage least squares regression results of local government debt (DEBT), capital expenditure (CAPX), and cash holdings (CASH) against the degree of religiosity (REL). In the first stage, we regress REL against a set of instruments, and in the second stage, we regress DEBT, CAPX, and CASH against the predicted value of REL from the first stage. Constant term is included but not reported. We obtain the local government finance data from the Census of Governments conducted by the U.S. Census Bureau on all local government organizational units in 1992, 1997, 2002, 2007 and 2012. The Census of Governments is conducted in years ending in '2' and '7'. Data are available as aggregates for counties, municipalities, towns, special districts, and school districts. We merge the local government finance data with religiosity data obtained from the Association of Religion Data Archives (ARDA). All variables are winsorized at both the upper and lower one-percentile to reduce the effect of extreme observations. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Variable definitions are presented in [Appendix A](#).

cash holdings. Consistent with the findings documented in [Autiero and Vinci \(2010\)](#) and [Elgin et al. \(2013\)](#), we show that local governments in counties with a higher degree of religiosity are more conservatively managed. They borrow less and spend less on capital investments, while holding more cash than local governments with a lower degree of religiosity. We perform a variety of robustness checks and our main results hold.

Given the responsibility of local governments to prudently and efficiently manage public resources, the findings of this study should be of interest to various local government stakeholders, including local residents, municipal bond buyers and credit ratings agencies. Our findings have major implications for local and perhaps higher-level governments, as they will help in understanding the behavioral aspects of government decision making. Future research may consider expanding the exploration of the impact of behavioral factors on local government financial decisions, for example, by examining the effect of these factors on local government financing, investing and cash holding decisions under various macroeconomic conditions, such as the financial crisis of 2008–09.

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Table 7
County and municipal government samples.

Dependent variable	County government sample			Municipal government sample		
	DEBT	CAPX	CASH	DEBT	CAPX	CASH
	(1)	(2)	(3)	(4)	(5)	(6)
REL	−0.069 (−5.008)***	−0.020 (−3.505)***	0.064 (2.897)***	−0.075 (−3.602)***	−0.031 (−4.394)***	0.018 (0.541)
POP	0.011 (0.553)	−0.004 (−1.943)*	0.022 (1.444)	0.028 (3.325)***	0.001 (1.048)	0.029 (3.760)***
AGE	−0.000 (−0.309)	0.000 (0.927)	0.005 (3.858)***	−0.007 (−5.966)***	−0.004 (−9.816)***	−0.000 (−0.274)
EDU	0.383 (5.473)***	0.158 (6.521)***	0.638 (6.518)***	0.239 (2.532)**	0.220 (6.207)***	0.566 (3.504)***
MARG	0.308 (4.569)***	0.219 (9.104)***	0.523 (6.035)***	0.174 (1.918)*	0.149 (5.605)***	0.183 (1.206)
URBAN	0.103 (8.555)***	0.015 (3.627)***	0.061 (3.505)***	0.018 (1.005)	0.009 (1.784)*	−0.071 (−2.814)***
MF	−0.129 (−4.512)***	0.043 (2.962)***	0.349 (6.135)***	0.120 (2.383)**	0.086 (5.028)***	0.336 (3.814)***
MIN	0.158 (6.084)***	0.071 (8.391)***	0.207 (6.003)***	−0.207 (−6.144)***	−0.034 (−3.154)***	−0.199 (−3.415)***
PLT	0.093 (4.028)***	0.002 (0.308)	−0.114 (−4.719)***	0.502 (9.804)***	0.018 (1.285)	−0.519 (−7.780)***
SIZE	0.189 (16.174)***	0.202 (31.103)***	−0.036 (−1.988)**	0.348 (27.244)***	0.393 (71.384)***	−0.183 (−9.742)***
EXP	0.010 (0.779)	0.040 (7.587)***	0.309 (15.107)***	−0.069 (−4.409)***	−0.034 (−6.087)***	0.091 (2.828)***
TAX	−0.069 (−5.008)***	−0.020 (−3.505)***	0.064 (2.897)***	−0.075 (−3.602)***	−0.031 (−4.394)***	0.018 (0.541)
Obs.	26,765	26,765	26,765	84,655	84,655	84,655
Adj. R ²	0.286	0.143	0.082	0.269	0.290	0.031

Notes: This table presents the regression results for the county government sample and municipal government sample, respectively. The regression is performed by ordinary least squares (OLS). The t-statistics (in parentheses) are computed using standard errors robust to both clustering at the firm level and heteroskedasticity. Constant term is included but not reported. We obtain the local government finance data from the Census of Governments conducted by the U.S. Census Bureau on county and municipal governments, respectively, from 1995 to 2009. We merge the local government finance data with religiosity data obtained from the Association of Religion Data Archives (ARDA). All variables are winsorized at both the upper and lower one-percentile to reduce the effect of extreme observations. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Variable definitions are presented in Appendix A.

Appendix A. Variable definitions

Variable	Variable definitions
AGE	Resident age, defined as the median age of county residents.
CAPX	Government capital expenditure, defined as the ratio of capital outlay over total revenue. Capital outlay is calculated as $F^* + G^* + K^*$. Total revenue is calculated as $A^* + B^* + C^* + D^* + T^* + U^*$.
CASH	Government cash holdings, defined as the ratio of cash and cash equivalents over total revenue. Cash and cash equivalents is calculated as $W31 + W36$. Total revenue is calculated as $A^* + B^* + C^* + D^* + T^* + U^*$.
DEBT	Government debt ratio, defined as the ratio of net long-term debt over total revenue. Net long-term debt is calculated as $41^* + 44^* - W01$. Total revenue is calculated as $A^* + B^* + C^* + D^* + T^* + U^*$.
EDU	Education, defined as the proportion of the county-level population over the age of 25 with a bachelor's degree or higher.
EXP	Government expenses, defined as the ratio of operating expenses over revenue. Operating expenses is calculated as $E^* + I^*$. Total revenue is calculated as $A^* + B^* + C^* + D^* + T^* + U^*$.
REL	Religiosity, defined as the proportion of religious adherents in the county, calculated as the number of religious adherents in a county (reported by Association of Religion Data Archives - ARDA) divided by the total population in the county (reported by the U.S. Census Bureau).
TAX	Tax income, defined as the ratio of tax income over revenue. Tax income is calculated as T^* . Total revenue is calculated as $A^* + B^* + C^* + D^* + T^* + U^*$.
MARG	Marriage, defined as the proportion of county households with a married couple.
MF	Male-female ratio, defined as the ratio of male to female residents in a county.
MIN	Minority, defined as the proportion of county residents who are non-white.
PLT	Political preferences, defined as the number of county residents who vote for the Democratic Party in the presidential election scaled by those who vote for either the Democratic Party or the Republican Party.
POP	Population, defined as the total county population (in millions).
SIZE	Government size, defined as total revenue (in billions of U.S. dollars) calculated as $A^* + B^* + C^* + D^* + T^* + U^*$.
URBAN	The proportion of the county population that lives in urban areas.

Notes: Appendix A presents the definition of variables. * refers to the sum of all the census data items beginning with the character before the sign (e.g., A^* means $A1 + A2 + \dots$).

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