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Local Religious Beliefs and Mutual Fund Risk-Taking Behaviors

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We study the effects of local religious beliefs on mutual fund risk-taking behaviors. Funds located in *low*-Protestant or *high*-Catholic areas exhibit significantly higher fund return volatilities. Similar differences persist when we use the religiosity ratios at fund managers' college locations. Risk-taking associated with local religious beliefs manifests in higher portfolio concentrations, higher portfolio turnover, more aggressive interim trading, and more "tournament" risk-shifting behaviors, but not over-weighting risky individual stocks. Overall, our results suggest that local religious beliefs have significant influences on mutual fund behaviors.

Key words: risk-taking; mutual funds; geographic location; religion
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1. Introduction

Do local religious beliefs affect mutual fund behaviors? Despite the large body of literature on mutual fund industry, the effects of local culture on mutual funds' investment decisions have never been explored. Local culture can exert a nonnegligible impact on mutual fund investments for several reasons. Fund managers and employees are likely to conform to the norms in local culture, as social identity theories (Tajfel 1978, Hogg and Abrams 1988) suggest that the value in sharing an identity and having a sense of being in a particular group has substantial influence on people's behaviors. Local culture can also affect the distribution of fund managers and employees in the labor market by attracting financial professionals who share the same cultural background (Schneider 1987, Hilary and Hui 2009). Consistent with this general view, a growing literature empirically examines the impact of local religious beliefs, an important aspect of local culture, on a wide range of *corporate* decisions such as corporate investments (Hilary and Hui 2009), option grants (Kumar et al. 2011), earnings management (Grullon et al. 2009, Dyreng et al. 2010), and tax avoidance (McGuire et al. 2012).

Although local religious beliefs have the potential to affect mutual fund investment decisions, competition and economic incentives could whittle down or even eliminate the influence of local culture. Compared to other sectors of the economy, the mutual fund industry is exceptionally competitive. Facing a stiff and ever-increasing competition from their peers, professional fund managers are under constant pressure to beat various benchmarks. This strong incentive to deliver superior performance should motivate fund managers to utilize performance-maximizing investment strategies. As these strategies are culturally invariant, the effects of local culture in this competitive industry may be negligible.

In this study, we empirically examine the effects of local religious beliefs on mutual fund risk-taking behaviors. We focus on risk-taking behaviors because prior survey studies provide strong and robust evidence that religious beliefs are associated with the risk attitudes of individuals. In particular, Catholics exhibit less aversion to speculative risk than the average population, but Protestants tend to be more averse to speculative risk (§2 provides a detailed discussion on the survey evidence). If mutual fund behaviors are in conformity with local culture, we expect mutual fund risk-taking behaviors to vary with local religious beliefs and predict that Protestant (Catholic) beliefs are negatively (positively) associated with fund return volatilities and the intensities of specific risk-taking behaviors.

Using a large sample of 1,621 unique growth and aggressive growth equity mutual funds over 21 years from 1988 to 2008, we examine the effects of county-level Protestant or Catholic ratios (i.e., the percentages of population in a particular county that are Protestants or Catholics) on return volatilities of mutual funds located in that county. We find that mutual fund return volatilities are negatively associated with Protestant ratio but positively associated with Catholic ratio. The effects of religious beliefs on fund return volatilities are economically significant. For example, the spread in idiosyncratic return volatilities between funds in the lowest and the highest quintiles of Protestant ratio represents about 20% of the sample standard deviation. Our results are robust after controlling for various fund characteristics, county-level demographic variables, fund locations (Christoffersen and Sarkissian 2009, 2011), and fund (or fund-family) fixed effects. Our results are also robust to the exclusion of funds in the New York and Boston areas that have large numbers of mutual funds and large Catholic populations.

We corroborate our fund location results by analyzing the impact of religious beliefs at the location of the *university* attended by a *fund manager*. This test alleviates the concern that the results we obtain using fund-location religiosity ratios could be driven by omitted characteristics of fund locations that are correlated with both local religious beliefs and mutual fund risk-taking. To ensure that this test is not contaminated by the same fund-location effects, we focus on managers whose former universities are far away from the locations of the funds they currently manage. Similar to the findings we obtain using fund location, we find that mutual fund idiosyncratic return volatilities are negatively (positively) associated with school-location Protestant (Catholic) ratio.

To further understand the specific risk-taking behaviors contributing to higher return volatilities, we examine the characteristics of fund holdings (Kacperczyk et al. 2005), turnover (Grinblatt and Keloharju 2009), trading aggressiveness (Kacperczyk et al. 2008, Huang et al. 2011), and tournament behavior (Brown et al. 1996, Chevalier and Ellison 1997). Regarding holding characteristics, we find that funds in counties with lower Protestant (or higher Catholic) populations concentrate their portfolios in fewer industries. However, we find no differences in their holdings of individual risky stocks, suggesting that the effects of religiosity ratios on risk-taking are at the portfolio level instead of the individual stock level.[1] With respect to trading activities, funds in counties with lower Protestant (or higher Catholic) populations exhibit higher portfolio turnovers, a manifestation of risk-taking associated with sensation-seeking. In addition, Protestant (Catholic) ratio is negatively (positively) associated with absolute return gap, a measure of aggressive interim trading. We also find that mutual funds' tournament risk-taking behavior—i.e., losers at the midyear take more risk in the second half of the year—only exists for funds in low-Protestant (or high-Catholic) counties.

Our paper is the first to show that the composition of local religious beliefs, an important aspect of local culture, has noticeable effects on important dimensions of mutual fund risk-taking behaviors, including variations in return volatility, portfolio concentration, turnover, absolute return gap, and tournament-related competition. Whereas extant studies on mutual funds focus on the influences of managerial abilities and fund characteristics, we significantly extend the mutual fund literature by showing that local culture has a significant impact on mutual fund behaviors.

Our study also contributes to the literature on mutual fund location. Whereas prior studies examine the potential advantages of a mutual fund due to its *relative location* to the stocks in its portfolio (Coval and Moskowitz 2001) or the externalities of large cities (Christoffersen and Sarkissian 2009, 2011), our study shows that location affects mutual fund's behaviors through local culture.

Our paper also makes important contributions to the nascent literature on the effects of local religious beliefs on organizational risk-taking behaviors (e.g., Hilary and Hui 2009, Kumar et al. 2011). Whereas Kumar et al. (2011) touch on institutional investors, we focus on mutual funds and observe different risk-taking behaviors. In addition, the consistent results we obtain using school-location religiosity ratios help alleviate potential concerns about omitted variable bias associated with the organization-location religiosity ratios used by prior research.

2. Local Religious Beliefs and Risk-Taking Behaviors

Economists and sociologists have long documented the strong effects of religious beliefs on a wide range of social behaviors.[2] Financial researchers have also documented the effects of religious beliefs at the macro level, such as on government performance, creditor protection, and economic growth

[1] Our results therefore cannot be explained by mutual fund managers investing disproportionally in risky local stocks (Coval and Moskowitz 1999).

[2] Many studies (e.g., Bainbridge 1989, Cochran and Akers 1989, Heaton and Pratt 1990, Thornton et al. 1992, Lehrer and Chiswick 1993, Evans et al. 1995) examine the effects of religious beliefs on behaviors such as suicide, drug and alcohol consumption, crime participation, marriage, divorce, and extramarital sex.

(e.g., La Porta et al. 1999, Stulz and Williamson 2003, Guiso et al. 2003).[3]

We examine the effects of local religious beliefs on *organizational* risk-taking behaviors. Two important premises underlying this investigation are (i) individuals' risk attitudes are related to their religious beliefs, and (ii) individuals' religious beliefs are consistent with local culture. Regarding the first premise, earlier research links religious beliefs to individuals' aversion to *pure* risk (Malinowski 1925, Miller and Hoffmann 1995) as a more risk-averse person tends to deal with losses and fears in a culturally appropriate way (i.e., through participation in religion).[4] Similarly, Hilary and Hui (2009) argue that individual anxiety drives the relation between religiosity and aversion to pure risk, as anxious individuals are more likely to seek comfort through church attendance (Rokeach 1968, Gasper and Clore 1998).

On the other hand, religious attitudes toward *speculative* risk may differ from those toward pure risk. Using life insurance data, Halek and Eisenhauer (2001) find that although Catholics are more *risk averse* than the average population, Catholics appear to be *more tolerant* of taking on the hypothetical gamble. The authors conjecture that this finding "may reflect differences in religious teachings regarding gambling in general; whereas some Protestant denominations view gambling as sinful, many Catholic parishes employ games of chance to raise funds for church use" (Halek and Eisenhauer 2001, p. 18). More recent survey studies further confirm the diverging attitudes toward speculative risk across religious beliefs (e.g., Barsky et al. 1997, Benjamin et al. 2010).

The second premise underlying our hypotheses is that the beliefs of fund managers and employees are consistent with local culture. There are two reasons why individuals' religious beliefs likely conform to the norms in local culture and religious beliefs. First, individuals choose to work and live in the areas with which the local culture and beliefs they feel comfortable. For example, Schneider (1987) suggests that people are attracted to situations that they think they will fit. Hilary and Hui (2009) argue that CEOs consistently choose to work for organizations with the same local culture. Second, individuals are likely influenced by local culture and beliefs through social interactions during which people reinforce preferences and experience so that they share the same identity with each other. This phenomenon is well documented by a large psychology literature on the social identity theory (e.g., Tajfel 1978, Hogg and Abrams 1988). Consistent with a significant local effect, Kumar et al. (2011) document that institutions located in regions with high Catholic-to-Protestant population ratio tend to hold more stocks with lottery features.[5]

Our principal hypothesis is that local Protestant and Catholic beliefs have diverging effects on mutual fund risk-taking behaviors because mutual funds primarily invest in financial assets and bear speculative risk. If Protestant (Catholic) beliefs are more (less) averse to speculative risk, we expect that mutual funds located in *low*-Protestant or *high*-Catholic areas exhibit more risky investment behavior. Whereas our main analyses focus on fund return volatilities, we also examine specific risk-taking strategies such as portfolio concentrations, turnover, trading aggressiveness, and tournament competition behavior.

3. Data and Sample Construction

3.1. Data Sources

We obtain data on religious beliefs from the American Religion Data Archive (ARDA).[6] ARDA data are constructed based on three surveys in 1980, 1990, and 2000, which include 111, 133, and 149 Judeo-Christian church bodies, respectively. Each survey provides the total number of adherents of each church in each county. We construct the *Protestant Ratio* (*Catholic Ratio*, *Total Religiosity Ratio*) of a county by summing the numbers of adherents of Protestant denominations (Catholic denominations, all religious denominations) within the county, and dividing it by the total population of the county.[7] We calculate religiosity ratios for each survey year (1980, 1990, 2000) and linearly interpolate the ratios to the nonsurvey years during 1981–1999. We apply the religiosity ratios in 2000 for the 2001–2008 period.

[3] Among the earliest works that discuss the effects of religious beliefs on social economy, Weber (1930) suggests that Protestantism contributed to the development of capitalism in Western countries as Protestantism encourages reinvestment of wealth in productive activities rather than consumption in luxury goods.

[4] Individuals risk attitudes can be classified broadly into attitude toward pure risk and that toward speculative risk. Pure risk refers to a situation where no gain is possible relative to the starting position like diseases and car accidents, whereas speculative risk refers to situations involving positive chances of both gains and losses like gambles. This distinction is well accepted in the risk management and insurance literature (e.g., Yates and Stone 1992, Anderson and Terp 2006) and is dated back to Emery (1900).

[5] Their evidence on institutional holdings does not necessarily imply risk-taking behaviors at the *portfolio* level, because idiosyncratic volatilities of individual stocks can be diversified away in large portfolios.

[6] This data set is constructed by the Association of Statisticians of American Religious Bodies and the Glenmary Research Center. It is distributed by the Association of Religion Data Archives (http://www.theARDA.com).

[7] ARDA classifies congregations into five groups: Catholics, Evangelical Protestants, Mainline Protestants, Orthodox, and the other groups. Following the literature (Hilary and Hui 2009, Kumar et al. 2011), we combine Evangelical Protestants and Mainline Protestants to form the group of Protestant congregations.

We hand collect the mutual fund location data from Nelson's Directories of Investment Managers for the years of 1988, 1994, 2000, and 2007. To avoid survivorship bias, we apply location data of a fund to subsequent fund-year observations until new data are collected (e.g., location data of 1988 are applied to 1989–1993). After obtaining the county location for each fund, we assign the domicile county's religiosity ratios to the fund.[8]

We obtain mutual fund returns data from the Survivor-Bias-Free U.S. Mutual Fund database maintained by the Center for Research in Security Prices (CRSP). To ensure that the funds in our sample are actively managed equity funds, we include only funds whose objectives are identified by Thomson Reuters as growth or aggressive growth. Our final sample consists of 15,013 fund-year observations of actively managed mutual funds during 1988–2008.

We control for a broad set of demographic variables in our analyses. Specifically, we obtain the following county-level demographic variables from the U.S. Census Bureau. *Age* is the median age of the county population. *Education* is the fraction of population holding a bachelor's degree or higher in the population over 25 years old. *Income* is the per capita personal income. *Population* is the total county population. *Minority* is the fraction of the minority populations in the total population. *Married* is the fraction of married households in total number of households. *Mf* is the ratio of male population to female population. *Population Density* is the total county population divided by its area size.[9] *Financial Center* is a dummy variable that equals one for financial center cities (Boston, Chicago, Los Angeles, New York, Philadelphia, and San Francisco) and zero otherwise (Christoffersen and Sarkissian 2009, 2011).

3.2. Descriptive Statistics

Table 1 shows that a typical fund is located in a county with 57.44% of religious population, which consists of 15.02% Protestant population and 32.29% Catholic population. Whereas the total religiosity ratio of our mutual fund sample is close to the U.S. average (55.64%), the Protestant–Catholic breakdown of our sample is the opposite of the U.S. population (39.67% Protestants and 13.26% Catholics). This is because our mutual fund sample is tilted toward regions with relatively heavy Catholic populations, such as Boston and New York. Nevertheless, Table 1 shows significant variations in religiosity ratios in our sample. For example, the 75th percentile of *Catholic Ratio* (39.93%) is almost twice the 25th percentile (23.35%); a similar pattern is observed with the *Protestant Ratio*.[10] Additionally, our mutual fund sample is quite dispersed geographically. Untabulated results show that the highest fund concentrations are in the states of New York (22% of sample), Massachusetts (20% of sample), and California (9% of sample), with the rest of the sample funds located in 41 other states.

We measure return volatility (*Volatility*) of each fund-year as the standard deviation of monthly fund returns during the year. We calculate idiosyncratic volatility (*Idiosyncratic Volatility*) as the volatility of the error terms from annual four-factor model regression of monthly fund returns on the market portfolio, SMB, HML, and UMD. A typical fund in our sample has a monthly idiosyncratic volatility of 1.44%. We observe a wide variation of idiosyncratic volatility in our sample. For example, the 75th percentile is 1.80%, more than twice the 25th percentile of 0.74%. We examine both total and idiosyncratic volatilities for our main analyses and then focus on idiosyncratic volatility in subsequent analyses as it allows us to isolate managerial risk-taking to beat benchmarks from general variations in systematic factors.

We obtain alphas and factor loadings of fund returns from the annual four-factor model described above. Consistent with the literature, a typical fund in our sample does not have a positive alpha. The mean and median alphas are about negative eight basis points. The return gap measure is defined as the monthly fund return in CRSP Mutual Fund database minus the buy-and-hold return of its portfolio as most recently disclosed in Thomson Reuters Mutual Fund Holdings database (Kacperczyk et al. 2008). We follow Huang et al. (2011) and use the absolute value of return gap to measure aggressiveness of interim trading. The average absolute return gap for our sample is 1.06% (per month). Additionally, an average fund in our sample turns its portfolio over almost once a

[8] Our data on mutual fund locations contain zip codes for each fund in the years 1988, 1996, and 2000, and longitude-latitude coordinates for each fund in the year 2007. For 1988, 1996, and 2000, we match zip codes with counties using the geographic file from the SAS data library. For 2007, we first obtain the longitudes and latitudes of counties from the Census 2000 Gazetteer File. We then match each fund to the county that has the shortest geographic distance from the longitude-latitude of the fund location. In a small number of cases where a fund is managed by more than one management company located in different regions, we use the simple average of religiosity ratios.

[9] Data for *Age*, *Education*, *Mf*, *Minority*, and *Married* at the county level are available for 1980, 1990, and 2000. We follow the same procedure as the one described above for the religiosity ratios to linearly extrapolate these variables for interim years. *Income*, *Population*, and *Population Density* are available from 1988–2000, and we apply their values in 2000 to the 2001–2008 period.

[10] Table 1 shows that about 10% of population has non-Protestant/Catholic religious beliefs. Because this group represents an aggregation of a large number of heterogeneous religious beliefs, we expect the economic effect of each individual belief on risk-taking to be relatively small.

Table 1 Summary Statistics

			Percentile				
	Mean	Std. dev.	5th	25th	Median	75th	95th
Religiosity ratios (%)							
Protestant Ratio	15.02	9.10	7.72	8.59	11.63	17.72	34.00
Catholic Ratio	32.29	11.75	9.01	23.35	36.72	39.93	49.14
Total Religiosity Ratio	57.44	10.79	39.11	50.38	57.81	67.41	73.22
Monthly volatility (%)							
Raw Volatility	4.99	2.89	1.96	3.11	4.28	6.05	10.26
Idiosyncratic Volatility	1.44	1.17	0.39	0.74	1.15	1.80	3.42
Monthly return (%)							
Raw Return	0.74	1.69	−2.35	−0.16	0.89	1.84	3.10
Four-Factor Alpha	−0.08	1.82	−1.50	−0.53	−0.08	0.36	1.52
Absolute Return Gap	1.06	1.64	0.04	0.22	0.54	1.23	3.76
Factor loadings							
Beta	1.00	0.42	0.41	0.83	0.99	1.17	1.65
SMB	0.28	0.58	−0.39	−0.08	0.22	0.59	1.12
HML	−0.02	0.62	−0.93	−0.33	−0.02	0.29	0.83
UMD	0.05	0.39	−0.50	−0.12	0.05	0.23	0.63
Fund characteristics							
Turnover	0.98	1.29	0.08	0.33	0.67	1.25	2.79
Age (in year)	10.20	7.00	1.92	4.92	8.33	12.92	25.92
Size (in $M)	1,105.21	3,353.01	8.72	69.20	240.55	821.80	4, 632.60
No. of Funds in Family	53.86	70.67	1	6	24	74	211

Notes. Our sample includes mutual funds at the intersection of Thomson Reuters Mutual Fund Holdings database and the CRSP Mutual Fund database over 1988–2008. To ensure that our sample comprises of actively managed equity funds, we include only funds whose objectives are identified by Thomson Reuters as growth (IOC = 2) or aggressive growth (IOC = 3). For each of these funds, we collect the mutual fund location from Nelson's 1988, 1994, 2000, and 2007 Directories of Investment Managers. Location data are applied to subsequent fund-year observations until new data are collected (e.g., location data of 1988 are applied to 1989–1993). After obtaining the county location information for each fund, we assign the domicile county's religiosity ratios to the fund. *Protestant Ratio* (*Catholic Ratio*, *Total Religiosity Ratio*) of a county is total number of adherents of Protestant congregations (Catholic congregations, all congregations) divided by total population of the county. *Volatility* is fund return volatility defined as standard deviation of monthly fund returns estimated at the annual interval. *Idiosyncratic Volatility* is defined as the volatility of the error terms from annual four-factor model regression of monthly fund returns (Carhart 1997). We also use these regressions to obtain *Alpha* and factor loadings on the market portfolio, *SMB*, *HML*, and *UMD*. *Absolute Return Gap* of a fund is the absolute value of return gap, where return gap is defined as its monthly fund return in CRSP Mutual Fund database *minus* the corresponding monthly buy-and-hold return of its portfolio as most recently disclosed in Thomson Reuters holdings database. *Turnover* is fund portfolio turnover defined as the minimum of aggregated sales or aggregated purchases by a fund divided by the total net assets (TNA) of the fund, obtained directly from CRSP mutual fund data. *Fund Age* is the number of years since the fund's first record in the CRSP Mutual Fund database. *Fund Size* is the TNA of the fund, measured in million dollars. *No. of Funds in Family* for a fund is the number of funds within the same management company as the fund.

year, but the variation in fund turnover is quite significant. Funds in our sample are relatively old and large, with a median age of 8.3 years and a median size of $241 million.[11] The median fund in our sample comes from a family with 24 funds.

4. Return Volatilities and Local Religious Beliefs

4.1. Portfolio Analysis of Return Volatilities

We form quintile portfolios of funds sorted on each of our religiosity ratios and then calculate time-series means of the annual average excess return volatilities and idiosyncratic volatilities for each quintile. Excess return volatility measure for a fund is calculated as the fund's volatility measure subtracting the sample median of all funds with the same objective in the same year. We also report differences between the highest and the lowest quintiles and the associated t-statistics calculated using Newey–West robust standard errors. Table 2 reports the means and medians of fund excess return volatilities for quintile portfolios sorted on religiosity ratios. Panel A shows that fund excess return volatility decreases with *Protestant Ratio*. The difference between the highest and the lowest quintiles of *Protestant Ratio* is −0.28% ($t = -2.96$). The difference is economically significant, representing about 15% of the standard deviation of excess return volatility for funds in our sample.

For excess idiosyncratic volatility measures, the mean values decrease monotonically in *Protestant Ratio*, with a spread of −0.20% between the highest

[11] The average fund age of our sample is higher than that of the mutual fund universe because of two reasons. First, the location data are missing for the short-lived funds that were founded and died between the two snapshots of fund location data. Second, to avoid survivorship bias, we apply fund location data to subsequent years until new data are collected (e.g., location data of 1988 are interpolated to 1989–1993). For the funds founded between two snapshots, their earliest several years are excluded from the sample until their locations are captured at the latter snapshot.

Table 2 Excess Fund Return Volatilities and Fund Returns Sorted on Religiosity Ratios

	Low (%)	2 (%)	3 (%)	4 (%)	High (%)	H–L (%)	*t*-stat.
Panel A: Excess volatilities sorted on religiosity ratios							
Sorted on *Protestant Ratio*							
Mean Volatility	0.40	0.24	0.27	0.18	0.12	−0.28***	(−2.96)
Median Volatility	0.05	0.01	0.00	−0.03	−0.09	−0.15	
Mean Idiosyncratic Volatility	0.32	0.25	0.17	0.16	0.12	−0.20**	(−2.50)
Median Idiosyncratic Volatility	0.02	0.03	−0.03	0.02	−0.03	−0.05	
Sorted on *Catholic Ratio*							
Mean Volatility	0.12	0.42	0.22	0.16	0.23	0.10***	(2.92)
Median Volatility	−0.08	0.09	0.01	−0.06	−0.01	0.07	
Mean Idiosyncratic Volatility	0.12	0.26	0.22	0.13	0.22	0.09***	(5.09)
Median Idiosyncratic Volatility	−0.02	0.04	0.04	−0.03	−0.01	0.01	
Sorted on *Total Religiosity Ratio*							
Mean Volatility	0.35	0.21	0.24	0.17	0.21	−0.14*	(−1.82)
Median Volatility	0.02	0.01	−0.04	−0.03	0.00	−0.02	
Mean Idiosyncratic Volatility	0.27	0.17	0.23	0.16	0.15	−0.12*	(−1.91)
Median Idiosyncratic Volatility	0.05	0.02	0.04	−0.02	−0.04	−0.09	
Panel B: Excess returns sorted on religiosity ratios							
Sorted on *Protestant Ratio*							
Monthly Return	0.06	0.02	−0.03	0.01	−0.03	−0.09*	(−1.87)
Four-Factor Alpha	−0.01	−0.03	−0.02	0.01	−0.02	−0.01	(−0.29)
Sorted on *Catholic Ratio*							
Monthly Return	−0.01	0.02	0.03	0.00	−0.01	0.00	(0.04)
Four-Factor Alpha	0.02	0.00	−0.02	−0.01	−0.01	−0.03	(−1.14)
Sorted on *Total Religiosity Ratio*							
Monthly Return	0.01	0.05	0.02	−0.03	−0.02	−0.03	(−1.04)
Four-Factor Alpha	0.00	0.04	0.01	−0.01	−0.08	−0.07	(−1.35)

Notes. Panel A reports average excess fund return volatilities and excess idiosyncratic volatilities across religiosity ratios. *Volatility* of a fund is standard deviation of monthly fund returns estimated at annual interval. *Idiosyncratic Volatility* of a fund is standard deviation of the error terms from annual four-factor model regression of monthly fund returns (Carhart 1997). To control for investment objective, we further adjust *Volatility* and *Idiosyncratic Volatility* of a fund by subtracting the annual median value within the fund's investment objective code. Each year during 1988–2008, we sort funds into quintiles of religiosity ratios of fund locations, where Protestant ratio (Catholic ratio, total religiosity ratio) of a county is total number of adherents of Protestant congregations (Catholic congregations, all congregations) divided by total population of the county. We then calculate the annual means and medians of the excess volatility measures for each quintile, and report the time-series means. We also report the differences between the top and bottom quintiles of religiosity ratios and the associated *t*-statistics (in parentheses). Panel B reports average mutual fund returns and alphas across religiosity ratios. Average return of a fund is annual average of monthly returns of the fund. We use annual four-factor model regression of monthly fund returns (Carhart 1997) to obtain *Four-Factor Alpha* as the intercept. To control for investment objective, we further adjust returns and alphas by subtracting the annual median values within the fund's investment objective code. Each year during 1988–2008, we sort funds into quintiles of religiosity ratios of fund locations then calculate the annual average excess returns and alphas for each quintile and report the time-series means. We also report the differences between the top and bottom quintiles of religiosity ratios and the associated *t*-statistics (in parentheses) calculated using Newey–West robust standard errors.

***, **, *Statistical significance at the two-tailed 1%, 5%, and 10% levels, respectively.

and the lowest quintiles. This spread represents about 20% of the sample standard deviation of excess idiosyncratic volatility for funds in our sample (0.96%). This spread in idiosyncratic volatility is about 70% of that in total volatility, suggesting that most of the variation in total volatility associated with local religious beliefs can be attributed to idiosyncratic risk as opposed to systematic risk.

The middle set of results in panel A shows reverse, albeit weaker, patterns for *Catholic Ratio*. Comparing the highest and the lowest quintiles of *Catholic Ratio*, we document significantly positive spreads for both mean and median values of excess total and idiosyncratic volatilities. The results in panel A are consistent with our hypothesis that funds located in areas with higher Protestant population or lower Catholic population take less risk. Given the opposite relations between volatility and the two major components of *Total Religiosity Ratio*, it is not surprising that we find total volatility and idiosyncratic volatility to be only weakly associated with *Total Religiosity Ratio*. These results highlight the importance of considering the heterogeneity in religious beliefs in examining the effects of religious beliefs on speculative risk-taking.[12]

[12] In unreported analyses, we observe that the differences in excess total and idiosyncratic volatilities between the tails (top/bottom 10% or 5%) of religiosity ratios are larger than the reported differences between the top and bottom quintiles of religiosity ratios. For example, for mean excess idiosyncratic volatilities across *Catholic Ratio* portfolios, the difference is 0.17% (0.33%) between the top and bottom 10% (5%) portfolios, much larger than the 0.09% between the top and bottom quintile portfolios. Our unreported analyses also show that the effects of *Protestant Ratio* and *Catholic Ratio* are stronger among smaller funds and persistent over our sample period.

A natural question is how the risk-taking associated with religious beliefs affects mutual fund performance. In panel B of Table 2, we sort funds into quintiles of religiosity ratios and for each quintile report the average monthly returns and *Four-Factor Alpha* estimated with annual four-factor regression of monthly fund returns (Carhart 1997). We observe a small spread in raw return between the top and bottom quintiles of *Protestant Ratio*, but this spread disappears once we control for risk factors. The difference in *Four-Factor Alpha* between the top and the bottom *Protestant Ratio* quintiles is essentially zero. Neither raw fund returns nor alphas vary significantly across *Catholic Ratio*. Thus, results in panel B show that the higher return volatilities of funds in counties with lower Protestant population or higher Catholic population are not rewarded by higher returns, consistent with these funds primarily taking excessive idiosyncratic risk.[13]

4.2. Regression Analysis of Fund Return Volatilities

We further perform multiple regressions of volatility measures that control for a broad set of fund characteristics and county-level demographic variables. Our regression model is

$$\begin{aligned} &Volatility_{i,t} \text{ or } Idiosyncratic\ Volatility_{i,t} \\ &\quad = \alpha_0 + \alpha_1 Religiosity\ Ratio_{i,t} + \alpha^j Fund_{j,i,t} \\ &\qquad + \alpha^k Demo_{k,i,t} + \alpha^l Year \times Style_{l,i,t} + \varepsilon_{1,i,t}, \quad (1) \end{aligned}$$

where *Volatility*, *Idiosyncratic Volatility*, and *Religiosity Ratio* are the total volatility, idiosyncratic volatility, and religiosity ratios, respectively, as defined in §3. We expect α_1 to be negative on *Protestant Ratio* but positive on *Catholic Ratio*.[14]

Fund is a vector of fund characteristics including *Fund Size*, *Fund Age*, and *No. of Funds in Family* (defined in §3). We control for fund size and age because larger and older funds are more established and on average may have smaller incentives to take risk (Chevalier and Ellison 1997). We also control for the number of funds in the family because managers could have greater incentives to take risks when there are more funds and hence greater competition within the same family (Kempf and Ruenzi 2008). *Demo* is a vector of county-level demographic characteristics as defined in §3. We control for these variables to ensure that we capture the marginal effects of religiosity ratios rather than their correlations with various demographic characteristics. For instance, we control for *Financial Center* because funds located in these cities may exhibit specific trading patterns due to stiffer labor market competition or better networking opportunities (Christoffersen and Sarkissian 2011). Finally, we include style-year fixed effects to control for potential heterogeneity in risk-taking behaviors across fund objectives and over time. As religious ratios are observed only at the county level, we report two-way clustered *t*-statistics by *year* × *county* and by fund.

Panel A of Table 3 presents the coefficients and the associated *t*-statistics from the regressions. The coefficients on *Protestant Ratio* are significantly negative. In particular, the coefficient on *Protestant Ratio* is −0.64% ($t = -1.82$) in the *Volatility* regression and −0.39% ($t = -2.74$) in the *Idiosyncratic Volatility* regression. In addition, the coefficients on *Catholic Ratio* are positive and statistically significant in both regressions. The economic significance of religiosity ratios remains in these multiple regression models. For instance, moving from the bottom to the top decile of *Protestant* (*Catholic*) *Ratio* is associated with a decrease (an increase) in *Idiosyncratic Volatility* with the magnitude of 0.10% (0.13%), which is comparable with our univariate result in Table 2.[15] Overall, the results reported in Table 3 are consistent with the prediction that funds in counties with lower *Protestant Ratio* or higher *Catholic Ratio* have higher return volatilities.

4.3. Robustness Checks

Despite the inclusion of controls for a broad set of demographical variables, one might still be concerned that the observed effects of local religiosity ratios are due to their correlations with some unobserved local demographical characteristics that also affect fund risk taking ("omitted variable problem"). To address this concern, we include fund fixed effects in the regressions. This test could have low power in our context as virtually no mutual fund family moves in our sample and religiosity ratios are quite sticky over time. However, we observe that 10% of our sample funds changed location during the 21-year sample period because of merger/acquisition activities in the financial industry and/or changes in fund advisers.

[13] As a robustness check, we calculate monthly alphas using loadings estimated in the previous 36-month rolling windows. The results are similar to those in panel B of Table 2. We also estimate multiple regressions of fund returns on religiosity ratios that control for fund characteristics and demographic variables. The unreported results confirm that fund returns do not vary with religiosity ratios.

[14] We also present results on *Total Religiosity Ratio* for the main regressions. Because our theory does provide clear predictions on the effects of *Total Religiosity Ratio*, we focus on *Catholic Ratio* and *Protestant Ratio* for the subsequent analyses.

[15] The coefficients of control variables are generally consistent with our expectations. The coefficients on *Fund Size* and *Fund Age* are negative, consistent with lower risk-taking incentives for larger funds and older funds. The consistent coefficients on *Mf* and *Married* suggest higher return volatilities for funds in counties with higher male population and fewer married households.

Table 3 Panel Regressions of Volatilities on Religiosity Ratios

Panel A: All observations

	Volatility			*Idiosyncratic Volatility*		
	Protestant	Catholic	Total religiosity	Protestant	Catholic	Total religiosity
Religiosity Ratio	−0.6367*	0.5734**	0.6771***	−0.3928***	0.3293***	0.3570***
	(−1.82)	(2.23)	(3.48)	(−2.74)	(3.03)	(3.84)
Log(*Fund Size, in $M*)	0.0050	0.0049	0.0055	−0.0999***	−0.1000***	−0.0996***
	(0.18)	(0.18)	(0.20)	(−7.32)	(−7.31)	(−7.27)
Log(*Fund Age, in Years*)	−0.2683***	−0.2712***	−0.2716***	−0.0256	−0.0273	−0.0274
	(−3.30)	(−3.32)	(−3.32)	(−0.93)	(−0.99)	(−0.99)
Log(*No. of Funds in Family*)	−0.0380*	−0.0390*	−0.0387*	−0.0091	−0.0096	−0.0094
	(−1.88)	(−1.91)	(−1.89)	(−1.11)	(−1.18)	(−1.16)
Dem.: Age	0.0416**	0.0491***	0.0582***	−0.0076	−0.0029	0.0019
	(2.00)	(2.62)	(2.97)	(−0.78)	(−0.34)	(0.23)
Dem.: Education	0.0028	0.0019	0.0016	0.0021	0.0016	0.0015
	(0.53)	(0.35)	(0.30)	(0.75)	(0.56)	(0.54)
Dem.: Income	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	(0.81)	(0.75)	(0.61)	(1.56)	(1.51)	(1.32)
Dem.: Log(*Population*)	−0.0067	−0.0122	−0.0133	−0.0295***	−0.0324***	−0.0326***
	(−0.46)	(−0.83)	(−0.85)	(−2.70)	(−2.88)	(−2.96)
Dem.: Mf	5.8002***	6.6417***	7.0825***	1.6821**	2.1819***	2.3929***
	(3.39)	(4.14)	(4.14)	(2.49)	(3.56)	(3.63)
Dem.: Minority	−0.2877	−0.1284	−0.2425	0.0264	0.1120	0.0380
	(−0.69)	(−0.30)	(−0.57)	(0.12)	(0.48)	(0.17)
Dem.: Married	−2.3811**	−2.5041***	−2.7879***	−0.7985	−0.8841	−1.0444*
	(−2.46)	(−2.80)	(−3.10)	(−1.37)	(−1.58)	(−1.88)
Dem.: Population Density	−4.1797	−3.4449	−4.8557	−5.4341***	−5.0083**	−5.7826***
	(−0.91)	(−0.76)	(−1.01)	(−2.64)	(−2.46)	(−2.70)
Dem: Financial Center	−0.0273	−0.0382	0.0368	0.0729	0.0696	0.1129**
	(−0.29)	(−0.41)	(0.49)	(1.37)	(1.37)	(2.28)
(*Year* × *Fund-Objective*) fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13,733	13,733	13,733	13,733	13,733	13,733
R^2	0.487	0.487	0.487	0.233	0.233	0.233

Panel B: Alternative estimates on religious ratios: Fixed effects regressions

	Volatility		*Idiosyncratic Volatility*	
	Protestant	Catholic	Protestant	Catholic
Include fund-family fixed effects	−3.4197***	2.2397**	−0.8241**	0.5881*
	(−2.69)	(2.30)	(−2.05)	(1.85)
Include fund fixed effects	−4.4319***	3.3109**	−1.2012**	0.9815**
	(−3.13)	(2.55)	(−2.61)	(2.11)

Panel B of Table 3 shows that, despite the potentially low power, the coefficients on *Protestant Ratio* (*Catholic Ratio*) remain significantly negative (positive) in the fund fixed effects regressions.[16] Panel B also shows that the results are similar when we include family fixed effects instead.[17] These results suggest that the effects of local religious beliefs are unlikely to be explained by the omitted correlated variables associated with fund locations.

Next, we repeat the regressions by excluding funds from Massachusetts and New York because these two areas have both high Catholic populations (about 40%, versus only about 26% for the rest of our sample) and large numbers of mutual funds (in total

[16] The larger magnitudes of coefficients in the fixed effect models reflect the relatively small within-fund variation in religious ratios for the full sample because of the stickiness of fund locations and local religious ratios.

[17] The regression results are also similar when we control for other fund family characteristics such as the total net assets (TNA) of a fund's family and a star fund dummy variable that equals one if there is a star fund in the fund's family (Nanda et al. 2004) and zero otherwise.

Table 3 (Continued)

Panel C: Alternative estimates on religious ratios: Robustness checks				
	Volatility		*Idiosyncratic Volatility*	
	Protestant	Catholic	Protestant	Catholic
Excluding NY and MA funds	−0.6393**	0.4369**	−0.3530**	0.2626***
	(−2.12)	(2.02)	(−2.54)	(2.72)
Two-way clustered standard errors by county × year and by family	−0.6367*	0.5734**	−0.3928***	0.3293***
	(−1.79)	(2.20)	(−2.56)	(2.80)
Newey–West robust standard errors	−0.6367*	0.5734**	−0.3928***	0.3293***
	(−1.94)	(2.38)	(−2.97)	(3.36)

Notes. Panel A reports multiple regressions of mutual fund return volatilities for the sample period of 1988–2008. *Volatility* of a fund is standard deviation of monthly fund returns estimated at the annual interval. *Idiosyncratic Volatility* of a fund is standard deviation of the error terms from the annual four-factor model regression of monthly fund returns (Carhart 1997). Independent variables include religiosity ratios and fund characteristics. Protestant ratio (Catholic ratio, total religiosity ratio) of a county is total number of adherents of Protestant congregations (Catholic congregations, all congregations) divided by total population of the county. *Fund Age* is the number of years since the fund's first record in the CRSP Mutual Fund database. *Fund Size* is the total net assets of the fund. *No. of Funds in Family* for a fund is the number of funds within the management company of the fund. We also include the following county-level demographic variables from the U.S. Census Bureau. *Age* is the median age of the county population. *Education* is the fraction of population that hold a bachelor's or higher degree in the population over 25 years old. *Income* is the mean per capita personal income of a county. *Population* is the total county population. *Minority* is the fraction of the minority populations in the total county population. *Married* is the fraction of married households in total number of households. *Mf* is the ratio of male population to female population in the county. *Population Density* is the total county population divided by its area size. *Financial Center* is a dummy variable that equals one for financial center cities (Boston, Chicago, Los Angeles, New York, Philadelphia, and San Francisco) and zero otherwise. We include year × fund-objective fixed effects in each regression. The *t*-statistics (in parentheses) are calculated using two-way clustered standard errors by year × county and by fund in all models. Panel B is similar to panel A but includes the fund-family fixed effects or fund fixed effects instead of year × fund-objective fixed effects. Panel C presents robustness checks that exclude funds located in New York and Boston, use two-way clustered standard errors by county × year and by fund family, or use Newey–West robust standard errors. Although we include the same set of control variables in regressions in panels B and C as in regressions in panel A, we do not tabulate these estimates for brevity. The parameter estimates are reported in percentages.

***, **, *Statistical significance at the two-tailed 1%, 5%, and 10% levels, respectively.

about 40% of our sample funds). Results in panel C of Table 3 show that the estimates are similar albeit slightly weaker, suggesting that our volatility results are not driven by the funds located in these high-Catholic areas.

We further examine whether the effects of religiosity ratios are robust to the alternative calculations of standard errors. Specifically, standard errors of funds within the same family may be correlated with each other. We repeat our regressions but with two-way clustered standard errors by *county* × *year* and by fund family. To control for time-series correlations of fund volatilities, we also repeat the regressions and report *t*-statistics using Newey–West robust standard errors. Results in panel C of Table 3 indicate that the *t*-statistics obtained from alternative specifications are very similar to those in panel A.

4.4. Return Volatilities and Fund Manager's School Location Religiosity Ratios

To further address the omitted variable problem associated with fund locations, we develop separate tests using the religiosity ratios around the locations of the universities attended by the managers (i.e., school-location religiosity ratios). School-location religiosity ratios likely capture the managers' religious beliefs, primarily because a person with certain religious belief is likely to choose a school where the culture is consistent with the religious belief of herself, her family, or her hometown. Additionally, local culture at the school location helps nurture one's beliefs during her school years. Because the essence of the omitted variable problem is the potential correlations between fund-location religiosity ratios and uncontrolled characteristics of fund location, we particularly focus on managers whose former universities are far away from the location of the funds they currently manage (over 500 miles away or in different U.S. Census Bureau regions).[18] This approach significantly alleviates the concern about omitted variables as it is unlikely that the religiosity ratios of a school location over 500 miles away or in different regions are still correlated with the characteristics associated with the fund's location.[19]

To operationalize our school-location measure, we collect from Morningstar the name of the university

[18] The U.S. Census Bureau divides the United States into four big regions based on the states. The classifications can be found at http://www.census.gov/geo/www/us_regdiv.pdf (last accessed May 14, 2012).

[19] We do not use the religious affiliation of the school attended by the manager as a measure of managers' religious beliefs, primarily because this is likely to misclassify a religious manager as nonreligious. In particular, we find that only less than 5% of fund-years in our sample are associated with a manager who attended a school with formal Protestant or Catholic affiliations, which would result in significant misclassification because the nonreligious proportion is too extreme compared to the underlying religious population (i.e., 57.4% for our sample).

Table 4 Idiosyncratic Volatilities of Fund Returns Across Religiosity Ratios of Fund Managers' School Locations: Distant Schools

Panel A: Excess idiosyncratic volatilities sorted on college-location religiosity ratios

	Low (%)	2 (%)	3 (%)	4 (%)	High (%)	H–L (%)	*t*-stat.
Sorted on *Protestant Ratio*							
Distance >500 miles	0.49	0.26	0.17	0.04	0.17	−0.32**	(−2.23)
Different regions	0.45	0.24	0.18	0.08	0.15	−0.29**	(−2.10)
Sorted on *Catholic Ratio*							
Distance >500 miles	0.07	0.26	0.16	0.18	0.47	0.40***	(2.40)
Different regions	0.11	0.22	0.16	0.21	0.39	0.28*	(1.80)

Panel B: Panel regressions of idiosyncratic volatilities on college-location religiosity ratios:

	Subsample: Distance >500 miles		Subsample: Different regions	
	Protestant	Catholic	Protestant	Catholic
School-Location Religiosity Ratio	−0.3867**	0.3127*	−0.4093***	0.2497*
	(−1.99)	(1.88)	(−3.68)	(1.76)
Fund characteristics	Yes	Yes	Yes	Yes
Demographic variables	Yes	Yes	Yes	Yes
(*Year* × *Fund-Objective*) fixed effects	Yes	Yes	Yes	Yes
Observations	2,980	2,980	3,196	3,196
R^2	0.264	0.265	0.263	0.263

Notes. Panel A reports excess idiosyncratic return volatilities of mutual funds sorted on school-location religiosity ratios of fund managers. We require the former schools attended by the manager(s) of a fund to be over 500 miles away from the fund or in different census regions from the fund's location. The region classification follows the U.S. Census Bureau's classification that divides the United States into four regions (northeast, midwest, south, and west). *Idiosyncratic Volatility* of a fund is standard deviation of the error terms from the annual four-factor model regression of monthly fund returns (Carhart 1997). To control for investment objective, we further adjust *Idiosyncratic Volatility* of a fund by subtracting the annual median value within the fund's investment objective code. Each year during 1988–2008, we sort funds into quintiles of average school-location religiosity ratios, where Protestant ratio (Catholic ratio) of a school location is total number of adherents of Protestant congregations (Catholic congregations) of the county where the school is located divided by total population of the county. We then calculate the annual mean value of the fund idiosyncratic volatilities for each quintile, and report the time-series mean. We also report the differences between the top and bottom quintiles of religiosity ratios and the associated *t*-statistics (in parentheses) calculated using Newey–West robust standard errors. Panel B reports multiple regressions of idiosyncratic volatilities of fund returns for the sample period of 1988–2008. Independent variables include the average school-location religiosity ratios of fund managers, fund characteristics, and demographic characteristics of fund location. *Fund Age* is the number of years since the fund's first record in the CRSP Mutual Fund database. *Fund Size* is the total net assets of the fund. *No. of Funds in Family* for a fund is the number of funds within the management company of the fund. We also include the following county-level demographic variables from the U.S. Census Bureau. *Age* is the median age of the county population. *Education* is the fraction of population that hold a bachelor's or higher degree in the population over 25 years old. *Income* is the mean per capita personal income of a county. *Population* is the total county population. *Minority* is the fraction of the minority populations in the total county population. *Married* is the fraction of married households in total number of households. *Mf* is the ratio of male population to female population in the county. *Population Density* is the total county population divided by its area size. *Financial Center* is a dummy variable that equals one for financial center cities (Boston, Chicago, Los Angeles, New York, Philadelphia, and San Francisco) and zero otherwise. We include year × fund-objective fixed effects in each regression. For brevity we do not tabulate the estimates for control variables in regressions. The parameter estimates are reported in percentages. The *t*-statistics (in parentheses) are calculated using two-way clustered standard errors by year × county and by fund in all models.

***, **, *Statistical significance at the two-tailed 1%, 5%, and 10% levels, respectively.

attended by a fund manager. We then obtain the religiosity ratios of the county in which that university is located, and calculate the average school-location religiosity ratios (*SLRR*s) for each fund that has at least one manager who attended a university that is distant from the fund location.

Panel A of Table 4 presents average excess idiosyncratic volatilities for mutual funds sorted on school-location religiosity ratios for the two subsamples where school location and fund location are either over 500 miles away or in different U.S. Census regions. For both subsamples, excess idiosyncratic volatilities decrease with school-location *Protestant Ratio* but increase with school-location *Catholic Ratio*, and the spreads between the top and bottom quintiles are statistically significant.[20] Panel B further reports the results of multiple regressions of idiosyncratic volatilities on the school-location religiosity ratios. We find significant negative coefficients on *Protestant SLRR* and positive coefficients on *Catholic SLRR*. Thus, our tests using school-location religiosity ratios provide strong evidence that religious beliefs affect the level of mutual fund risk-taking.

[20] We also repeat the analyses for the full sample that include nondistant managers and obtain similar results.

5. How Do Local Religious Beliefs Affect Specific Risk-Taking Behaviors of Mutual Funds?

In this section, we complement our main return volatility results by examining the effects of local religious beliefs on specific risk-taking behaviors that contribute to the variation in fund return volatilities. In particular, we examine both the holding- and trading-based risk-taking behaviors.

5.1. Analyses of Fund Holdings

We first test whether the differences in fund return volatilities across religiosity ratios are due to funds holding individual stocks with higher return volatilities (Kumar et al. 2011). Panel A of Table 5 shows no differences in the average excess idiosyncratic volatilities or skewness of the individual stocks held by funds across religiosity ratios. In panel B, the results of multiple regressions of average idiosyncratic volatilities or skewness of mutual fund holdings are consistent with panel A in that the coefficients on the religiosity ratios are insignificant. Thus, the differences in fund return volatilities across religiosity ratios are not driven by funds holding risky individual stocks. This result is not surprising because idiosyncratic volatilities of individual stocks can be diversified away in a portfolio.

Although we observe no differences in idiosyncratic volatilities of individual stocks in fund portfolios, fund holdings may affect fund return volatilities through portfolio diversification. To explore this possibility, we first examine the idiosyncratic volatilities of the hypothetical holdings-based returns, which are the buy-and-hold returns of a portfolio comprising all stocks held by a fund according to its most recent filing.[21] Panel A of Table 6 shows that holdings-based idiosyncratic volatilities are higher for funds with low *Protestant Ratio* or high *Catholic Ratio*. Because we observe no difference in the volatilities of individual stocks held by the fund in Table 5, the difference in holdings-based return volatilities must be driven by the lack of diversification.

We therefore directly investigate industry concentration of fund portfolios using two measures following Kacperczyk et al. (2005): (i) industry Herfindahl index, defined as the sum of squared industry weights of fund portfolio, and (ii) KSZ (Kacperczyk, Sialm, and Zheng) industry concentration ratio, defined as the sum of squared differences between a fund's industry weights and the corresponding market's industry weights. Panel B of Table 6 shows that both concentration measures are higher for funds with lower *Protestant Ratio* or higher *Catholic Ratio*, indicating that these funds tend to deviate from a well-diversified portfolio and concentrate in fewer industries. We further perform multiple regressions of holdings-based idiosyncratic volatilities and the concentration measures in panel C. The results are consistent with the sorting analyses in panels A and B except for the insignificant coefficient on *Catholic Ratio* in the model of Herfindahl index. Overall, the results in Table 6 indicate that a lack of portfolio diversification contributes to greater holdings-based return volatilities of funds with low *Protestant Ratio* or high *Catholic Ratio*, which in turn contributes to higher fund return volatilities.[22]

5.2. Analyses of Trading Activities

In this subsection, we analyze trading activities by mutual funds as a function of local religiosity ratios. We first examine fund portfolio turnover because Grinblatt and Keloharju (2009) suggest that turnover is a manifestation of risk-taking behavior associated with sensation-seeking. In particular, sensation seekers search for novel, intense, and varied experiences generally associated with real or imagined physical, social, and financial risks. The trait generates various risk-taking behaviors such as risky driving, risky sexual behavior, frequent career changes, and gambling (Raylu and Oei 2002).

Consistent with religious beliefs affecting fund turnover, panel A of Table 7 shows that annual turnover decreases monotonically from the lowest quintile of *Protestant Ratio* (1.09 times per year) to the highest quintile (0.79 times per year). The difference between the highest and the lowest quintiles of −0.30 is both statistically and economically significant, representing a 28% decrease from the lowest to the highest quintile. In addition, we observe a positive but weaker association between turnover and *Catholic Ratio*.

We also examine the effects of religiosity ratios on absolute return gap, an indicator of interim trading aggressiveness. Following Kacperczyk et al. (2008) and Huang et al. (2011), we define absolute return gap

[21] We limit the holding period to six months in this analysis. In other words, we drop fund-month observations for which we do not observe a holdings report in the preceding six months.

[22] Kumar et al. (2011) find that general institutional investors in high-Catholic or low-Protestant areas tend to hold risky individual stocks but we show that this is not the case for mutual funds. One explanation for this difference is that mutual fund managers experience closer scrutiny and, therefore, are less willing to take risks on individual stocks that may be observable to competitors and clients. Another explanation is that they are sophisticated enough to take risk at the portfolio level instead of the individual stock level (which can be offset by diversification).

Table 5 Average Idiosyncratic Volatilities and Skewness of Mutual Fund Holdings Across Religiosity Ratios

Panel A: Average excess idiosyncratic volatility and skewness of stocks held by mutual funds

	Low (%)	2 (%)	3 (%)	4 (%)	High (%)	H–L (%)	*t*-stat.
Sorted on *Protestant Ratio*							
Excess idiosyncratic volatility	−0.12	0.01	0.14	0.17	−0.18	−0.06	(−0.87)
Excess idiosyncratic skewness	0.08	0.35	0.56	0.17	−0.64	−0.72	(−1.47)
Sorted on *Catholic Ratio*							
Excess idiosyncratic volatility	−0.19	0.26	0.06	0.01	−0.21	−0.02	(−0.16)
Excess idiosyncratic skewness	−0.27	−0.40	0.01	0.34	0.11	0.38	(0.83)

Panel B: Regressions of average idiosyncratic volatility and skewness on religiosity ratios

	Dependent variable: *Idiosyncratic Volatility*		Dependent variable: *Idiosyncratic Skewness*	
	Protestant	Catholic	Protestant	Catholic
Religiosity Ratio	−0.0178	0.0110	−0.0184	0.0160
	(−1.05)	(0.72)	(−0.23)	(0.17)
Log(*Fund Size, in $M*)	−0.0003	−0.0003	0.0007	0.0006
	(−1.02)	(−1.34)	(0.42)	(0.41)
Log(*Fund Age, in Years*)	−0.0026**	−0.0027**	−0.0048	−0.0049
	(−2.34)	(−2.49)	(−0.32)	(−1.06)
Log(*No. of Funds in Family*)	−0.0005***	−0.0005***	0.0005	0.0004
	(−3.24)	(−3.42)	(0.57)	(0.48)
Dem.: Age	−0.0008***	−0.0008***	−0.0027**	−0.0027*
	(−3.57)	(−2.89)	(−2.02)	(−1.78)
Dem.: Education	0.0028**	0.0028**	0.0037	0.0038
	(2.02)	(2.06)	(1.05)	(1.01)
Dem.: Income	0.0004***	0.0007***	0.0016	0.0019
	(2.86)	(3.47)	(1.03)	(1.37)
Dem.: Log(*Population*)	−0.0001**	−0.0002***	−0.0004	−0.0004
	(−2.02)	(−2.85)	(−0.92)	(−1.01)
Dem.: Mf	0.0000***	0.0000**	0.0000*	0.0000*
	(2.64)	(2.52)	(1.71)	(1.69)
Dem.: Minority	0.0002*	0.0001	0.0018	0.0015
	(1.75)	(0.88)	(1.46)	(1.25)
Dem.: Married	0.0873***	0.1066***	0.1299**	0.1658**
	(6.57)	(7.32)	(2.00)	(2.34)
Dem.: Population Density	−0.0038	−0.0020	−0.0163	−0.0085
	(−1.39)	(−0.58)	(−0.71)	(−0.34)
Dem.: Financial Center	−0.0196**	−0.0255***	−0.0359	−0.0401
	(−2.48)	(−3.03)	(−0.57)	(−0.76)
(*Year* × *Fund-Objective*) fixed effects	Yes	Yes	Yes	Yes
N (years)	21	21	21	21
Observations	13,733	13,733	13,733	13,733
R^2	0.495	0.495	0.055	0.055

Notes. Panel A reports for each quintile of religiosity ratios the average excess idiosyncratic volatility and skewness of stocks held by mutual funds. For each stock, we estimate the idiosyncratic volatility and skewness using annual four-factor model regression. We then calculate the dollar-weighted average of idiosyncratic volatility and skewness for each fund portfolio and subtract the annual median value of funds with the same investment objective code. We report the averages using stocks held in the fourth quarter. We also report the differences between the top and bottom quintiles of religiosity ratios and the associated *t*-statistics (in parentheses) calculated using Newey–West robust standard errors. The skewness measures are scaled by 100 for the ease of reading. Panel B reports multiple regressions of average idiosyncratic volatilities and skewness on fund location religiosity ratios. The control variables are defined as in the heading of Table 3. We include year × fund-objective fixed effects in each regression. The *t*-statistics (in parentheses) are calculated using two-way clustered standard errors by year × county and by fund in all models.

***, **, *Statistical significance at the two-tailed 1%, 5%, and 10% levels, respectively.

Table 6 Analyses of Idiosyncratic Volatilities of Holdings-Based Fund Returns and Industry Concentration of Fund Portfolio

Panel A: Excess idiosyncratic volatilities of holdings-based portfolio returns

	Low	2	3	4	High	H–L	*t*-stat.
Sorted on *Protestant Ratio*							
Excess idiosyncratic volatility	0.24%	0.25%	0.15%	0.20%	0.11%	−0.12%***	(−6.68)
Sorted on *Catholic Ratio*							
Excess idiosyncratic volatility	0.13%	0.24%	0.21%	0.11%	0.24%	0.11%***	(4.10)

Panel B: Industry concentration measures of mutual fund portfolios

	Low	2	3	4	High	H–L	*t*-stat.
Sorted on *Protestant Ratio*							
Industry Herfindahl index	0.14	0.17	0.10	0.11	0.09	−0.04***	(−5.33)
KSZ concentration index	0.26	0.30	0.23	0.24	0.22	−0.04***	(−3.58)
Sorted on *Catholic Ratio*							
Industry Herfindahl index	0.10	0.13	0.15	0.10	0.14	0.04***	(5.21)
KSZ concentration index	0.23	0.26	0.28	0.23	0.26	0.03***	(4.95)

Panel C: Regressions of holdings-based portfolio measures on religious ratios

	Holdings-based portfolio idiosyncratic volatilities		Industry Herfindahl index		KSZ Herfindahl index	
	Protestant	Catholic	Protestant	Catholic	Protestant	Catholic
Religiosity Ratio	−0.6856***	0.5378***	−6.8919***	1.5685	−9.5312***	5.0221***
	(−3.03)	(3.74)	(−2.81)	(1.09)	(−4.37)	(3.89)
Fund characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Demographic variables	Yes	Yes	Yes	Yes	Yes	Yes
(*Year* × *Fund-Objective*) fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	12,858	12,858	13,733	13,733	13,733	13,733
R^2	0.206	0.206	0.177	0.177	0.134	0.133

Notes. Panel A reports for each quintile the average excess idiosyncratic volatility of *holdings-based returns*, where the monthly holding-based returns are the monthly buy-and-hold returns of mutual funds' reported stock holdings. Idiosyncratic volatility of holding-based returns of a fund is standard deviation of the error terms from the annual four-factor model regression of the fund's holdings-based monthly returns. To control for investment objective, we further adjust idiosyncratic volatility of a fund's holdings-based returns by subtracting the annual median value within the fund's investment objective code. Each year during 1988–2008, we sort funds into quintiles of religiosity ratios of fund locations, where Protestant ratio (Catholic ratio, total religiosity ratio) of a county is total number of adherents of Protestant congregations (Catholic congregations, all congregations) divided by total population of the county. We then calculate the annual means and medians of holdings-based idiosyncratic volatilities for each quintile, and report the time-series means. We also report the differences between the top and bottom quintiles of religiosity ratios and the associated *t*-statistics (in parentheses) calculated using Newey–West robust standard errors. Panel B reports average industry concentration of mutual fund portfolios across quintiles of religiosity ratios. We report the Herfindahl index of industry weights and the KSZ measure of industry concentration. KSZ measure is the sum of squared differences between a fund's industry weights and the corresponding market's industry weights (Kacperczyk et al. 2005). We report the averages using stocks held in the fourth quarter. Panel C reports multiple regressions of holdings-based idiosyncratic volatilities and industry concentration measures on fund location religiosity ratios. The control variables are defined as in the heading of Table 3. For brevity we do not tabulate the estimates for control variables in regressions. We include year × fund-objective fixed effects in each regression. The *t*-statistics (in parentheses) are calculated using two-way clustered standard errors by year × county and by fund in all models.

***, **, *Statistical significance at the two-tailed 1%, 5%, and 10% levels, respectively.

as the absolute value of the difference between net investor return and the net holding return:

$$|Return\ Gap_t| = |Return\ of\ Fund_t - (Return\ of\ Holding_t - Fund\ Expense_t)|, \quad (2)$$

where $Return\ of\ Fund_t$ is the relative change in the net asset value of the fund share (including total dividend and capital gains distributions during period t) divided by the net asset value at the beginning of period t. $Return\ of\ Holding_t$ is calculated as the returns of stocks (held by the fund based on the most recent disclosure date) weighted by number of shares held by the fund. $Fund\ Expense_t$ is the expense ratio of the fund during period t.

Results in panel B of Table 7 show that monthly absolute return gap decreases from 1.04% per month to 0.97% per month, moving from funds in the lowest *Protestant Ratio* quintile to those in the highest

Table 7 Mutual Fund Excess Turnover and Absolute Return Gap Across Religiosity Ratios

Panel A: Excess annual turnover ratio sorted on religiosity ratios

	Low	2	3	4	High	H–L	*t*-stat.
Sorted on *Protestant Ratio*							
Mean excess turnover	1.09	1.00	0.95	0.86	0.79	−0.30***	(3.51)
Median excess turnover	1.15	1.03	0.86	0.86	0.77	−0.38	
Sorted on *Catholic Ratio*							
Mean excess turnover	0.75	0.92	1.01	0.94	1.20	0.44	(1.56)
Median excess turnover	0.69	0.93	0.98	0.88	0.95	0.27	

Panel B: Monthly absolute return gap sorted on religiosity ratios

	Low	2	3	4	High	H–L	*t*-stat.
Sorted on *Protestant Ratio*							
Mean absolute return gap	1.04%	1.04%	1.01%	1.00%	0.97%	−0.08%***	(−2.74)
Median absolute return gap	0.65%	0.65%	0.64%	0.60%	0.61%	−0.04%	
Sorted on *Catholic Ratio*							
Mean absolute return gap	0.93%	0.99%	0.99%	1.06%	1.08%	0.15%***	(5.80)
Median absolute return gap	0.56%	0.64%	0.64%	0.65%	0.68%	0.12%	

Panel C: Parameter estimates from regressions of turnover ratio and absolute return gap

	Annual turnover ratio		Monthly absolute return gap	
	Protestant	Catholic	Protestant	Catholic
Religiosity Ratio	−0.6929**	1.4453***	0.0923	0.4835***
	(−2.02)	(3.88)	(0.58)	(3.10)
Fund characteristics	Yes	Yes	Yes	Yes
Demographic variables	Yes	Yes	Yes	Yes
(*Year* × *Fund-Objective*) fixed effects	Yes	Yes	Yes	Yes
Observations	6,970	6,970	100,129	100,129
R^2	0.050	0.055	0.093	0.094

Notes. Panel A reports average mutual fund excess turnover ratios across religiosity ratios. *Turnover Ratio* is the annual portfolio turnover obtained from CRSP directly and is the minimum of aggregated sales or aggregated purchases by a fund divided by the total net assets of the fund. To control for investment objective, we further adjust *Turnover Ratio* of a fund by subtracting the annual median value of all funds with the same investment objective code. Each year during 1988–2008, we sort funds into quintiles of religiosity ratios, where Protestant ratio (Catholic ratio, total religiosity ratio) of a county is total number of adherents of Protestant congregations (Catholic congregations, all congregations) divided by total population of the county. We then calculate the annual means and medians of fund turnovers for each quintile, and report the time-series means. We also report the differences between the top and bottom quintiles of religiosity ratios and associated *t*-statistics (in parentheses) calculated using Newey–West robust standard errors. Panel B reports average monthly absolute return gaps across religiosity ratios. Monthly absolute return gap of a fund is defined as the absolute value of the difference between the fund's reported monthly return and the monthly buy-and-hold return of the fund's portfolio disclosed in the previous period. Panel C reports panel regressions of turnovers or absolute return gaps where independent variables are religiosity ratios, fund characteristics, and demographic characteristics of fund location. We also include fund-level and county-level variables as defined in the heading of Table 3 but for brevity do not tabulate the estimates for these variables. The *t*-statistics (in parentheses) are calculated using two-way clustered standard errors by year × county and by fund in all models.

***, **, *Statistical significance at the two-tailed 1%, 5%, and 10% levels, respectively.

Protestant Ratio quintile. The difference of a negative eight basis points is statistically significant. We also observe a strong but reverse pattern when funds are sorted based on *Catholic Ratio*.

In panel C of Table 7, we report multiple regressions of turnover or absolute return gap on religiosity ratios that control for fund characteristics and county-level demographical characteristics. The regression results are largely consistent with the univariate results reported in panels A and B. In the regressions of turnover, we find significant coefficients on both *Protestant Ratio* and *Catholic Ratio*. In the regression of absolute return gap, the coefficient on the *Catholic Ratio* is significantly positive, but the coefficient on the *Protestant Ratio* becomes statistically insignificant. On balance, the results in Table 7 indicate that funds in areas of low-Protestant population (or high-Catholic population) trade more frequently and have larger absolute return gaps. These results are consistent with variations in interim trading also contributing to the variations in fund return volatilities across local religiosity ratios.

5.3. Tournament Risk-Taking Behavior

Mutual fund managers face a tournament-like environment in which annual winners receive large reward (i.e., in terms of money inflow and compensation) but losers do not face harsh punishment. Thus, midyear losers have strong incentives to take risk in the latter period of the year (Brown et al. 1996, Chevalier and Ellison 1997). We therefore predict that the tournament risk-taking by mutual funds is stronger for funds located in areas with lower *Protestant Ratio* (higher *Catholic Ratio*).

Following prior studies, we use a standard deviation ratio (SDR) analysis to examine the tournament risk-taking behavior. Specifically, the tournament hypothesis predicts the following:

$$\frac{\sigma_{2,L}}{\sigma_{1,L}} > \frac{\sigma_{2,W}}{\sigma_{1,W}}, \tag{3}$$

where $\sigma_{i,j}$ denotes the standard deviation of mutual fund j's return during the ith half of the year; $j = L$ (a "loser") when the fund had poor performance in the first half of the year and $j = W$ (a "winner") when the fund had good performance during the first half of the year. We employ daily returns for this analysis because Busse (2001) suggests that daily returns produce better estimates of SDRs.[23] For return volatility measure, we follow Chen and Pennacchi (2009) to focus on "tracking error," which is the standard deviation of style-adjusted daily fund returns.

We follow the literature to divide funds into two by two groups of half-year performance and SDRs and present the frequencies for funds in the top and bottom terciles of *Protestant Ratio* in panel A of Table 8. For the low *Protestant Ratio* tercile portfolio, we document higher frequencies in the low return/high SDR cell than in the low return/low SDR cell across all assessment periods. In addition, three out of five chi-square tests are statistically significant, rejecting the null that the frequencies are similar across the four return/SDR cells. On the other hand, for funds in the high *Protestant Ratio* tercile, there is little evidence supporting the existence of tournament risk-taking behavior. Panel B presents the results for funds sorted on *Catholic Ratio*, which show that tournament behavior is mainly concentrated in the high *Catholic Ratio* portfolios. In the low *Catholic Ratio* portfolio, none of the chi-square statistics is close to being significant, suggesting no increase in risk conditional on midyear performance. Thus, results are consistent with our prediction that tournament risk-taking behaviors are stronger (weaker) for funds located in areas with lower *Protestant Ratio* (higher *Catholic Ratio*).

[23] Our sample period for the tests on tournament risk-taking behavior starts from 1999 because of the availability of data on daily mutual fund returns.

5.4. Effects of Religious Beliefs on the Attitudes Toward Pure Risk

Prior survey studies find that Protestant and Catholic beliefs have opposite effects on the attitudes toward speculative risk but share a common aversion to pure risk. In this section, we examine the distinct effects of religiosity on speculative risk and pure risk (Hilary and Hui 2009, Kumar et al. 2011). Because prior evidence suggests that Catholicism is positively related to speculative risk but negatively related to pure risk, we expect the positive effect of *Catholic Ratio* on fund return volatilities to be mitigated when fund managers face higher pure risk.

Kempf et al. (2009) find that managers face heightened employment risk during bear markets because of the low fund inflows and the poor fund performance in aggregate (Chevalier and Ellison 1999, Zhao 2005). The heightened employment risk during bear market represents elevated pure risk because it significantly increases the probability of job loss with little chance of promotion. We thus predict that the positive association between Catholic beliefs and fund return volatilities to be less pronounced when the aversion to pure risk shared by Catholic beliefs becomes a more significant component of managers' decision making. We estimate the following multiple regressions:

$$\begin{aligned} &\textit{Idiosyncratic Volatility}_{i,t} \\ &= \gamma_0 + \gamma_1 \textit{Catholic Ratio}_{i,t} + \gamma_2 \textit{Catholic Ratio}_{i,t} \\ &\quad \times \textit{High Pure Risk}_t + \gamma_3 \textit{High Pure Risk}_t + \gamma^j \textit{Fund}_{j,i,t} \\ &\quad + \gamma^k \textit{Demo}_{k,i,t} + \gamma^l \textit{Year} \times \textit{Style}_{l,i,t} + \varepsilon_{3,i,t}, \end{aligned} \tag{4}$$

where *High Pure Risk* is a dummy variable equal to one if the observation is in a year of high employment risk as a result of poor market conditions, and all the other variables are defined in §3.[24] For robustness we use three definitions of poor market conditions—negative midyear returns, negative annual returns, and the period following the tech bubble (years 2000, 2001, and 2002). We expect that $\gamma_2 < 0$.

Table 9 presents the results of regressions. We observe negative coefficients on the interaction terms of *Catholic Ratio* with each proxy for higher pure risk (*Negative Midyear Return*, *Negative Full-Year Return*, *Post-Bubble Period*). The estimated coefficients are statistically significant at conventional levels ($t \leq -2.01$), and the point estimates of the interaction terms are almost as large as those of *Catholic Ratio*, indicating

[24] *High Pure Risk* is not included in the multiple regressions because its effect is absorbed by the *Year* × *Fund-Objective* fixed effects. Furthermore, in various specifications of this model, the variance inflation factors (VIFs) for the interaction term range from 1.14 to 1.21, well below the critical threshold levels of 5 or 10 that typically indicate the presence of a multicollinearity problem.

Table 8 Mutual Fund Tournament Risk-Taking Across Religiosity Ratios: 1999–2008

	Low return		High return			
	Low SDR	High SDR	Low SDR	High SDR	χ^2	p-value
Panel A: Frequency distributions across Protestant ratios (%)						
Low *Protestant Ratio*						
(5, 7)	23.46	26.39	26.39	23.75	7.45*	0.059
(6, 6)	23.96	25.89	25.89	24.26	3.07	0.381
(7, 5)	23.29	26.56	26.56	23.59	9.34**	0.025
(8, 4)	23.67	26.18	26.18	23.96	5.39	0.145
(9, 3)	22.75	27.11	27.11	23.04	16.97***	0.001
High *Protestant Ratio*						
(5, 7)	24.32	25.59	25.59	24.51	1.50	0.682
(6, 6)	25.81	24.10	24.10	26.00	3.53	0.317
(7, 5)	25.40	24.51	24.51	25.59	1.07	0.785
(8, 4)	25.81	24.10	24.10	26.00	3.53	0.317
(9, 3)	25.03	24.88	24.88	25.21	0.08	0.994
Panel B: Frequency distributions across Catholic ratios (%)						
Low *Catholic Ratio*						
(5, 7)	24.15	25.76	25.76	24.33	2.54	0.469
(6, 6)	24.92	24.99	24.99	25.10	0.02	0.999
(7, 5)	24.41	25.50	25.50	24.59	1.12	0.771
(8, 4)	25.28	24.63	24.63	25.47	0.63	0.889
(9, 3)	24.33	25.58	25.58	24.52	1.47	0.690
High *Catholic Ratio*						
(5, 7)	23.35	26.56	26.56	23.53	10.70**	0.013
(6, 6)	24.19	25.72	25.72	24.37	2.30	0.513
(7, 5)	23.09	26.82	26.82	23.27	14.49***	0.002
(8, 4)	23.38	26.53	26.53	23.57	10.21**	0.017
(9, 3)	22.80	27.11	27.11	22.98	19.51***	0.000

Notes. Panel A presents mutual fund tournament risk-taking behavior across Protestant ratios. Our sample period covers 1999–2008 because of the availability of daily mutual fund data. Each year we sort funds into terciles of Protestant ratios of fund locations, where Protestant ratio of a county is total number of adherents of Protestant congregations divided by total population of the county. Then within each tercile of Protestant ratio, in each year we divide funds into two by two groups based on whether midyear return is below or above the median, and whether SDR (standard deviation ratio) is above or below the median. For each $(X, 12 - X)$ row, midyear return of a fund-year is the buy-and-hold return of the fund in the first X months of the year, and SDR is the ratio of standard deviation of returns in the last $(12 - X)$ months of the year to standard deviation of returns in first X months of the year. Both midyear return and SDR are calculated using daily mutual fund returns, and we follow Chen and Pennacchi (2009) to adjust a fund's daily return for investment objective by subtracting equal-weighted average daily return of all funds with the same investment objective. We then report percentage frequency for each 2×2 cell using observations over all years. We also report chi-square statistic and p-value relative to an equal probability distribution. The medium tercile is not reported for brevity. Panel B repeats the test but with Catholic ratio, where Catholic ratio of a county is total number of adherents of Catholic congregations divided by total population of the county.

***, **, *Statistical significance at the 1%, 5%, and 10% levels, respectively.

that the common aversion to pure risk completely negates the positive relation between Catholicism and speculative risk. Thus, the results in Table 9 support that aversion to pure risk associated with Catholic belief reduces the positive association between Catholic belief and speculative risk. This evidence highlights the distinction between the effects of aversion to pure risk and the preferences for speculative risk associated with religious beliefs.

6. Conclusion

We study how local religious beliefs, an important aspect of local culture, affect mutual fund risk-taking. We find that funds in low-Protestant or high-Catholic areas take more speculative risks as manifested in significantly higher fund return volatilities. We also document consistent effects of religious beliefs on specific fund risk-taking behaviors: higher portfolio concentrations, greater portfolio turnover, more aggressive interim trading, and stronger "tournament" risk-taking. Our findings are consistent with previous theories and survey evidence about the associations between religious beliefs and risk attitudes. Our results indicate that, despite the intense competition within the mutual fund industry, the influences of local culture on mutual fund behaviors are nonnegligible. Because local culture depends on the geographic location, our results also provide an explanation for why mutual fund location may be important for investors.

Our paper is the first to show that local religious beliefs, an important aspect of local culture, have a noticeable impact on mutual fund behaviors. Whereas extant studies on the mutual fund industry focus on managerial abilities and fund characteristics, we make

Table 9 Effect of Employment Risk on the Relation Between Catholic Ratio and Idiosyncratic Return Volatility

Independent variable	Model 1	Model 2	Model 3
Catholic Ratio	0.3968***	0.3904***	0.3915***
	(2.73)	(2.70)	(2.70)
Catholic Ratio × *Negative Midyear Return*	−0.3232**		
	(−2.40)		
Catholic Ratio × *Negative Full-Year Return*		−0.2776**	
		(−2.16)	
Catholic Ratio × *Post-Bubble Period*			−0.3144**
			(−2.01)
Log(*Fund Size, in $M*)	−0.1000***	−0.1000***	−0.1000***
	(−7.32)	(−7.32)	(−7.32)
Log(*Fund Age, in Years*)	−0.0272	−0.0272	−0.0272
	(−0.98)	(−0.98)	(−0.98)
Log(*No. of Funds in Family*)	−0.0096	−0.0096	−0.0096
	(−1.17)	(−1.17)	(−1.17)
Dem.: Age	−0.0032	−0.0029	−0.0033
	(−0.38)	(−0.34)	(−0.38)
Dem.: Education	0.0015	0.0016	0.0014
	(0.51)	(0.55)	(0.50)
Dem.: Income	0.0000	0.0000	0.0000
	(1.54)	(1.51)	(1.54)
Dem.: Log(*Population*)	−0.0325***	−0.0324***	−0.0325***
	(−2.89)	(−2.89)	(−2.89)
Dem.: Mf	2.1720***	2.1829***	2.1690***
	(3.58)	(3.59)	(3.58)
Dem.: Minority	0.1134	0.1126	0.1138
	(0.49)	(0.48)	(0.49)
Dem.: Married	−0.8802	−0.8839	−0.8799
	(−1.58)	(−1.59)	(−1.57)
Dem.: Population Density	−5.0797**	−5.0132**	−5.0991**
	(−2.47)	(−2.45)	(−2.47)
Dem.: Financial Center	0.0687	0.0688	0.0687
	(1.34)	(1.35)	(1.34)
(*Year* × *Fund-Objective*) fixed effects	Yes	Yes	Yes
Observations	13,733	13,733	13,733
R^2	0.233	0.233	0.233

Notes. This table reports multiple regressions of idiosyncratic volatilities of mutual fund returns for the sample period 1988–2008. The regressions are similar to those in Table 3 with the addition of interactions between the Catholic ratio and annual indicator variables that correspond to periods of heightened employment risk due to poor market conditions, i.e., negative midyear market return (model 1), negative full-year market return (model 2), or the post-tech bubble period (model 3). We also include fund-level and county-level variables as defined in the heading of Table 3. We include year × fund-objective fixed effects in each regression. The parameter estimates are reported in percentages. The *t*-statistics (in parentheses) are calculated using two-way clustered standard errors by year × county and by fund.

***, **, *Statistical significance at the two-tailed 1%, 5%, and 10% levels, respectively.

important contributions to the literature by showing that local culture has significant effects on mutual fund behaviors. Our paper also makes important contributions to the nascent literature on the effects of local religious beliefs on organizational risk-taking behaviors (e.g., Hilary and Hui 2009, Kumar et al. 2011). Whereas Kumar et al. (2011) find that local religious beliefs affect institutional investors' propensity to hold risky individual stocks, we find that local religious beliefs influence mutual funds risk-taking at the portfolio level—for instance, by holding more concentrated portfolios—rather than at the individual stock level. In addition, we provide new evidence on the impact of religious beliefs using school-location religiosity ratios, which helps alleviate potential concerns about omitted variable bias associated with the organization-location religiosity ratios in prior research. Finally, we bridge the gap between Hilary and Hui (2009) and Kumar et al. (2011) by providing evidence consistent with survey results that Protestant and Catholic beliefs have different attitudes toward speculative risk but share a common aversion to pure risk. Our findings therefore significantly improve the understanding of the effects of local religious beliefs on organizational risk-taking behaviors.

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