*Local Religious Beliefs and Organizational Risk-Taking Behaviors**

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ABSTRACT

We study two distinct effects of local religions on organizational risk-taking: religious beliefs share a common aversion to *pure risk* but have diverging attitudes toward *speculative risk*. We find that mutual fund managers' speculative risk-taking behaviors vary with specific local religious beliefs – funds in low-Protestant (or high-Catholic) areas have higher return volatilities, display stronger "tournament" behaviors, have higher portfolio concentrations, and trade more aggressively. However, these diverging effects are attenuated by heightened employment risk, reflecting the common aversion to pure risk. We identify implicit compensation contracting as a channel linking local religious beliefs to mutual fund risk-taking behaviors.

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1. Introduction

Understanding organizational risk-taking behaviors is one of the most important research areas in finance research. Recent studies have shown considerable interests in the effects of local religious beliefs on organizational risk-taking behaviors (e.g., Hilary and Hui, 2009; Kumar, Page, and Spalt, 2010). This line of inquiry is in part motivated on the ground that local religious beliefs can be closely related to organizational risk-taking attitudes yet exogenous to the organizations. For local religious beliefs to affect organizational risk-taking decisions, two conditions must be established. First, individuals' religious beliefs are unambiguously related to their risk attitudes. Second, risk-taking attitudes of the *local individuals* translate into risk-taking behaviors at the *organizational* level.

The evidence in recent empirical studies, however, has not led to a consensus on how Protestant and Catholic beliefs, the two major religious beliefs in the U.S., are related to risk attitudes. For example, while Hilary and Hui (2009) find that both Protestant and Catholic beliefs share a common aversion to risk-taking in the context of *corporate* investments, evidence in Kumar et al. (2010) suggests that Protestant and Catholic beliefs might have diverging effects on risk-taking in the context of *financial* investments. Additionally, previous studies have not explicitly examined the channels through which local risk attitudes are translated to organizational behaviors. Our study contributes to the growing literature on the effects of local religious beliefs on risk-taking by examining these two conditions in the setting of the U.S. mutual fund industry.

We posit that there is an important distinction between religious attitudes toward *pure risk* and those toward *speculative risk*.[1] Pure risk (or "downside" risk) refers to a situation in which no gain is possible relative to the starting position (e.g., diseases, car accidents), while speculative risk involves positive chances of both gains and losses (e.g., gambles). Prior survey studies on pure risk find that religiosity is associated with higher risk aversion regardless of specific beliefs, reflecting a greater psychological desire to handle the fear and anxiety of losses (Miller and Hoffmann, 1995; Halek and Eisenhauer, 2001; Hilary

[1] We refer to risk as a situation in which the outcomes and associated odds are well defined or measurable with historical data (Knight, 1921). Risks can be further categorized into *pure risk* and *speculative* risk (e.g., Williams, 1966; Trieschmann and Gustavson, 1998).

and Hui, 2009). In contrast, survey results on speculative risk suggest that Catholics are less risk-averse than the average population but Protestants are more risk-averse than or similar to the average population, consistent with the differences in religious teachings (Barsky, Juster, Kimball, and Shapiro, 1997; Halek and Eisenhauer, 2001; Benjamin, Choi, and Fisher, 2010).[2] Section 2 provides a detailed discussion on the potential causes of these contrasting attitudes toward pure risk vis-à-vis speculative risk.

This distinction between religious attitudes toward pure risk and speculative risk helps explain the mixed empirical evidence in recent studies on the effects of religious beliefs on risk-taking behavior. Specifically, Hilary and Hui (2009) find that *both* local Protestant and Catholic beliefs are associated with lower corporate investments. In contrast, Kumar et al. (2010) show institutional investors located in regions with high Catholic (or low Protestant) populations have higher portfolio weights in stocks with higher idiosyncratic volatilities and skewness.[3] The mixed empirical evidence on the effects of religious beliefs on risk-taking can be reconciled using our proposition. Findings related to real investments in Hilary and Hui (2009) reflect the common aversion to pure risk, because corporate managers are particularly concerned with downside risk when they evaluate investment decisions (MacCrimmon and Wehrung, 1986; Shapira, 1986; March and Shapira, 1987).[4] On the other hand, because financial investments bear speculative risk, we may observe diverging risk attitudes between Protestant and Catholic beliefs with respective to financial investments.

[2] Halek and Eisenhauer (2001), for instance, examine both pure and speculative risks and document a clear distinction on how each of these types of risk relates to specific religious beliefs. They find that, compared to the average population, Catholics are more tolerant of speculative risk but less tolerant of pure risk. They conjecture that this result may reflect differences in religious teachings regarding gambling. While some Protestant denominations view gambling as sinful, many Catholic parishes employ games of chance to raise funds for church use.

[3] Kumar et al (2010) focus on the effects of local religious beliefs on *gambling attitudes* (i.e., preference for skewness) and therefore financial outcomes such as institutional portfolio weights of stocks with lottery features (high idiosyncratic volatility and skewness), IPO returns, option compensation grants, etc. Since their lottery stocks are identified partly based on risk (volatility), different *risk attitudes* between Catholic and Protestant beliefs may contribute to their findings. However, they do not examine *risk attitudes* (preference for volatility) separately. Additionally, their results on portfolio weights provide only *suggestive* evidence on risk attitudes because volatilities or risks of individual stocks can be diversified away in a portfolio, especially for institutional investors who typically hold a large number of stocks.

[4] For example, MacCrimmon and Wehrung (1986) find that most corporate managers view risk as only associated with the negative outcomes. Shapira (1986) also document that 80 percent of corporate managers consider only the negative outcomes as risk.

The mutual fund industry provides a unique setting to distinguish religiosity-related aversion to pure risk and speculative risk. In particular, while observing *quantifiable* measures of risk-taking behaviors is typically difficult in many settings, mutual funds have been documented to exhibit multiple dimensions of risk-taking behaviors such as fund return volatility (Sirri and Tufano, 1998), tournament risk-taking (Brown, Harlow, and Starks, 1996; Chen and Pennacchi, 2009), portfolio turnover, and industry concentration (Kacperczyk, Sialm, and Zheng, 2005). Moreover, the wide array of risk-taking dimensions in this setting significantly alleviates the concern that results based on only a single measure of risk-taking are caused by omitted factors other than risk-taking attitudes. The mutual fund setting also allows us to examine the potential channel that translates individual risk attitudes into organizational behaviors as we can estimate the strength of fund managers' incentives through fund flow-performance relations (Chevalier and Ellison, 1997).

Our main predictions are as follows. We first predict that various religious beliefs have diverging effects on mutual fund risk-taking behaviors as mutual funds primarily invest in financial assets and thus bear speculative risk. Second, we predict that, when mutual fund managers are more concerned with pure risk such as employment risk (Kempf, Ruenzi, and Thiele, 2009), the diverging effects of religious beliefs on speculative risk-taking are attenuated by common aversion to pure risk. Lastly, we expect that implicit compensation contracts link local individuals' risk attitudes to mutual funds' risk-taking behaviors (Chevalier and Ellison, 1997). Because individuals invest more heavily in local securities (Zhu, 2002; Ivkovic and Weisbenner, 2005), investors with low (high) risk aversion can encourage (discourage) local fund managers' risk-taking behaviors through a more (less) convex flow-performance relation (Sirri and Tufano, 1998; Del Guercio and Tkac, 2002). We therefore predict that the convexity of flow-performance relations varies with local religious beliefs and that the effects of local religious beliefs are stronger among mutual funds that rely more on local money.

Using a large sample of 1,621 unique growth and aggressive growth equity mutual funds over 21 years from 1988 to 2008, we test our predictions with county-level Protestant or Catholic ratios (i.e., the percentages of population in a particular county that are Protestants or Catholics) and the return properties

of mutual funds located in that county. Consistent with our first main prediction that religious beliefs have diverging effects on speculative risk taking, we find that mutual fund return volatility is decreasing in Protestant ratio but increasing in 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 percent of the sample standard deviation.

The relations between religious beliefs and fund return volatilities are robust when we control for various fund characteristics and when we follow recent work in the literature (Hilary and Hui, 2009; Kumar et al., 2010) to control for a broad set of county-level demographic variables (age, education, income level, population size, racial makeup, household composition, and population density). We further examine the geographical clustering of our sample funds. Our mutual fund sample is geographically dispersed, with the highest concentrations in New York (22% of sample), Massachusetts (20% of sample), and California (9% of sample) but the rest of the funds located in 41 other states. Our results are also robust to the exclusion of funds in the New York and Boston areas which have large numbers of mutual funds, high population densities, and large Catholic populations. Our results are also not driven by the coincidence of mutual fund managers' propensity to hold local stocks (Coval and Moskowitz, 1999) and cross-regional variation in local stocks' characteristics (such as growth stocks).

To test our second main prediction on the effects of common aversion to pure risk in all religious beliefs, we focus on the opposite attitudes of Catholic beliefs toward speculative risk and pure risk: Catholicism is positively related to speculative risk but negatively related to pure risk. We predict that the positive effect of Catholic ratio on fund return volatilities should be mitigated when fund managers face higher pure risk. Kempf et al. (2009) find that managers face heightened employment risk during bear markets due to the low fund inflows and the poor fund performance in aggregate (Chevalier and Ellison, 1999; Zhao, 2005). Employment risk is a pure risk rather than speculative risk because it does not involve a chance of gain. Consistent with our prediction, we find that the positive effect of Catholic ratio on mutual fund return volatilities becomes significantly weaker during bear markets.

We also find evidence consistent with our third main prediction that the implicit incentive contracts (i.e., fund flows) translate local individuals' risk-taking attitudes into fund risk-taking behaviors. We find that fund flows are more sensitive to good performance for funds located in areas with lower Protestant ratio (or higher Catholic ratio). In addition, the effects of local religious beliefs on fund return volatilities are significantly stronger among funds that rely more on local money (i.e., small funds, funds with low marketing efforts, and funds in areas with low mutual fund concentration).

Finally, to corroborate our main finding on fund return volatility, we examine multiple dimensions of mutual fund risk-taking behaviors and find consistent diverging effects of religious beliefs on each of these dimensions. Specifically, funds located in low-Protestant (or high-Catholic) regions exhibit strong tournament risk-taking behavior in which losers at the mid-year take more risk in the latter period of the year, while funds located in high-Protestant (or low-Catholic) regions exhibit no such behavior. We further find that funds located in low-Protestant (or high-Catholic) regions take more risk *not* by holding more stocks with high idiosyncratic volatilities but by holding less diversified portfolios (e.g., higher industrial concentration) and by trading more aggressively (e.g., higher portfolio turnover).

Our paper makes three important contributions to the nascent literature on the effects of religious beliefs on organizational risk-taking behaviors. We are the first to provide a comprehensive set of evidence of the diverging effects of Protestant and Catholic beliefs on mutual fund risk-taking behaviors. Our results on multiple dimensions of risk-taking (fund return volatility, tournament behavior, industry concentration, portfolio turnover, etc.) present consistent and robust evidence that mutual fund risk-taking are negatively related to local Protestant beliefs but positively related to local Catholic beliefs.

Second, our study complements Hilary and Hui (2009) by proposing a unified framework of the effects of religious beliefs on risk-taking behaviors that distinguishes between pure risk and speculative risk. While religiosity is associated with a common aversion to pure risk which results in lower level of corporate real investments as documented in Hilary and Hui (2009), specific beliefs have different attitudes toward speculative risk which in turn lead to diverging effects on financial investment decisions

such as mutual fund risk-taking. Our finding that religious beliefs' diverging effects on mutual fund risk-taking are attenuated by heightened employment risk lends further support to this proposition.

Third, consistent with the contracting literature (Chevalier and Ellison, 1997; Sirri and Tufano 1998; Kempf et al. 2009), we provide evidence that implicit compensation contracts serve as an important channel through which local religious beliefs influence mutual fund risk-taking behaviors. While this evidence is obtained in the mutual fund setting, it highlights the important role of managerial incentive contracts in facilitating the influence of local religious beliefs on risk-taking behaviors in other types of organizational settings (e.g., corporate investment decisions).

Our paper also makes important contributions to the mutual fund literature by documenting the strong relations between local religious beliefs and mutual fund risk-taking behaviors, which have important effects on investment allocation decisions. In particular, our paper provides evidence that local religious beliefs significantly contribute to a number of important dimensions of mutual fund risk-taking behaviors including variation in return volatility, tournament-related competition, industry concentration of fund portfolio, and return gap (Kacperczyk, Sialm, and Zheng, 2008). Our study also complements prior research on the consequence of mutual fund location. While 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 size of its domicile city (Christoffersen and Sarkissian, 2009), our study shows how local religious beliefs affect the fund's risk-taking behaviors.[5]

The rest of the paper is organized as follows. Section 2 discusses prior evidence regarding local religious beliefs and risk-taking behaviors. Section 3 describes our data, and Section 4 analyzes the effects of local religious beliefs on fund return volatilities. Section 5 further examines specific risk-taking behaviors including tournament competition, portfolio concentration, fund turnover and return gap. Section 6 concludes.

[5] Our results are not due to the potential combined effects of local bias of mutual fund managers (Coval and Moskowitz, 1999) and cross-regional variation in local stock characteristics. In particular, we find no evidence of variations in the average volatility and skewness of mutual fund holdings across regions with varying local religious beliefs.

2. Local religious beliefs and risk-taking behaviors

Economists and sociologists have long documented the strong effects of religious beliefs on the macro economy and on a wide range of social behaviors.[6] Financial researchers have also documented the effects of religious beliefs at the macro level, such as on government performance, creditor protection, and economic growth (e.g., La Porta, Lopez-de-Silanes, Shleifer, and Vishny, 1999; Stulz and Williamson, 2003; Guiso, Sapienza, and Zingales, 2003). Recent studies have started to explore the effects of local religious beliefs on *organizational* risk-taking behaviors. In this section we distinguish between individuals' attitudes toward pure risk and those toward speculative risk. We also present evidence that local religious beliefs are related to mutual fund risk-taking behaviors through the fund flow-performance relations.

2.1. Religious beliefs and aversion to pure risk

Malinowski (1925) develops the classic perspective in the social study of religion and risk-taking principles. He suggests that religiosity is related to a desire to deal with pure risk that results in significant losses in life and cannot be fully controlled given the level of technological sophistication (e.g., natural disaster, disease, and death). Miller and Hoffmann (1995) formally propose a risk-approach analysis of religiosity in which a more risk-averse person tends to deal with losses and fears in a culturally appropriate way (i.e., through participation in religion). More recently, 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). In sum, these studies suggest that religiosity is positively associated with individuals' aversion to pure risk.

Consistent with this perspective, results from survey studies indicate that religiosity is associated with higher aversion to pure risk. For example, Miller and Hoffmann (1995) use data collected by Bachman, Johnston, and O'Malley (1993) at the University of Michigan's Survey Research Center on a nationally

[6] Many studies (e.g., Bainbridge, 1989; Cochran and Akers, 1989; Heaton and Pratt, 1990; Thornton, Axinn, and Hill, 1992; Lehrer and Chiswick, 1993; Evans, Cullen, Dunway, and Burton, 1995) examine the effects of religious beliefs on behaviors such as suicide, drug and alcohol consumption, crime participation, marriage, divorce, and extra-marital sex.

representative sample of American high school seniors. They focus on respondents' answers on attraction to risk and danger (i.e., adventure seeking) and find a negative correlation between self-reported importance of religion and attraction to risk. In addition, it appears that religious individuals are less apt at trading off potential gains and losses when states, outcomes, and associated odds are difficult to assess (i.e., situations with high uncertainty). In these situations, religious individuals' aversion to downside losses appears to dominate upside gains. Hilary and Hui (2009) examine the European Social Survey data maintained by the Norwegian Social Science Data Services and correlate the frequency of religious service attendance with several measures of aversion to uncertainty (e.g., the importance of living in safe and secure surroundings, and the importance of trying new and different things in life). They find negative correlations between religious attendance and measures of preference for risk-taking.

Hilary and Hui (2009) also find empirical evidence that U.S. firms whose headquarters are located in counties with higher Catholic or Protestant populations are less likely to engage in risky investment projects. This evidence is consistent with the common aversion to pure risk associated with religious beliefs as corporate managers tend to perceive downside risk as the dominant component of risk under uncertainty. Specifically, MacCrimmon and Wehrung (1986) survey 509 high-level executives of Canadian and American firms and find that while most of these managers view risk as associated with only the negative outcomes, and they do not consider uncertainty about positive outcomes to be an important aspect of risk. Additionally, Shapira (1986) surveys 50 American and Israeli executives and also finds that 80% of the corporate executives consider only negative outcome as risk. March and Shapira (1987) further observe that corporate managers view the amount expected loss and the magnitude of possible bad outcome as the most salient aspect of risk, indicating that managers' aversion to downside risk may dominate under uncertainty (Kahneman and Tversky, 1979; Sitkin and Pablo, 1992; Yates and Stone, 1992).

2.2. Religious beliefs and aversion to speculative risk

There is evidence that religious attitudes toward pure risk differ from those toward speculative risk. Halek and Eisenhauer (2001) analyze how religious are associated with both pure risk (measured by the

amount of life insurance purchased by U.S. households) and speculative risk (measured by the responses to a hypothetical gamble). They conduct this analysis on a *single* sample of households collected by University of Michigan Health and Retirement Study (HRS). Interestingly, while the analysis on the life insurance data suggests that Catholics are more *risk averse* than the average population, Catholics appear to be *more tolerant* of taking on the hypothetical gamble.[7] They 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" (p. 18).

A number of survey studies also present consistent evidence of diverging attitudes toward speculative risk across religious beliefs. Barsky et al. (1997) quantify individual risk aversion to speculative risk based on the same hypothetical gambling setting as the one used by Halek and Eisenhauer (2001), and find strong evidence that Protestants tend to have a higher aversion to speculative risk than the average population while Catholics have a relatively lower aversion to speculative risk. Similarly, a recent study by Benjamin, et al. (2010) based on survey responses to gambling questions also finds that Catholics are more tolerant of speculative risk.

Kumar et al. (2010) specifically focus on the contrasting religious teachings regarding *gambling* attitudes (i.e., preference for skewness) and invoke a similar argument to Halek and Eisenhauer (2001): While Protestant denominations view gambling as sinful, many Catholic parishes employ games of chance (e.g., bingo and raffles) for church fund raising. These contrasting teachings might result in diverging effects of Catholic and Protestant beliefs on gambling attitudes and therefore financial decisions involving skewness. They find that institutional investors located in regions with high ratios of Catholic-to-Protestant population (their CPRATIO measure) tend to hold more stocks with lottery features (i.e., high idiosyncratic volatility and high skewness), firms located in the high CPRATIO regions tend to have larger employee stock option plans, and IPOs of the high CPRATIO regions earn higher first-day returns. Because they identify lottery stocks partly based on risk (volatility), different *risk attitudes* between

[7] The HRS survey questioned respondents regarding their willingness to accept a new job with a 50 percent chance of doubling their current household income and a 50 percent chance of reducing it by one-third.

Catholic and Protestant beliefs may contribute to their findings. In addition, their evidence on institutional holdings does not necessarily imply risk-taking behaviors at the *organizational* level because, unlike skewness, idiosyncratic volatilities of individual stocks can be diversified away in the large portfolios held by financial institutions.

2.3. Channels linking local risk attitudes and mutual fund risk taking

While the literature provides consistent evidence that individuals' religious beliefs are associated with their risk-taking attitudes, it still begs the question of how local individuals' risk-taking attitudes translate into risk-taking behaviors at the organization level.[8] Chevalier and Ellison (1997) argue that mutual fund managers' risk-taking is largely motivated by their incentives. Because fund managers are usually compensated by a fixed percentage of assets under management and because fund flows (i.e., changes in assets) are strongly related to fund performance (e.g., Patel, Zeckhauser, and Hendrick, 1990; Sirri and Tufano, 1993), fund managers have incentives to align their risk-taking with the strength of the flow-performance relation to maximize the total assets of their funds. In effect, the fund flow-performance relation serves as an implicit incentive contract.

We therefore propose a link between local risk attitudes and organizational risk-taking behaviors through the contracting-based channel – a fund's flow-performance sensitivity varies with local religious beliefs, which in turn affect the manager's risk-taking behaviors.[9] Specifically, prior studies find a convex flow-performance relation in the U.S. mutual fund industry (Sirri and Tufano, 1998; Del Guercio and Tkac, 2002), in which funds are rewarded for good performance with large money inflows but are not proportionately punished for bad performance with large money outflows. A more convex flow-performance relation can increase a fund manager's propensity to take risk (Smith and Stulz, 1985). If investors in an area with low Protestant or high Catholic population prefer high fund return volatility and

[8] Neither Hilary and Hui (2009) nor Kumar et al. (2010) have explicitly examined the channels through which local religious beliefs influence organizational behaviors. Hilary and Hui (2009) argue that attraction, selection, and attrition result in a manager's behaviors being consistent with the organization's culture, which is molded by the people surrounding it.

[9] Massa and Patgiri (2009), for example, document that high-incentive implicit contracts induce fund managers to take excess risk.

invest heavily in local funds, we expect these investors to induce more risk-taking behaviors of local fund managers through a more convex flow-performance relation.

To examine the cross-regional variations in flow-performance relations, we estimate the relation between fund flows and annual fund return for the sub-sample of funds located in areas with relatively high and low Protestant or Catholic populations. We plot the estimated flow-performance relations in Figure 1.

< Figure 1 about here >

Consistent with our prediction, Panel A of Figure 1 presents evidence that the flow-performance relation of funds located in areas with low Protestant populations is more convex (i.e., a greater shift in the slope) than that of funds located in areas with high Protestant populations. Panel B shows that the flow-performance relation is more convex for funds with high Catholic ratio than for funds with low Catholic ratio. These results suggest that the flow-performance sensitivity is a channel through which fund managers' risk-taking behaviors are affected by the risk attitudes of local mutual fund investors. If fund flows from local investors indeed influence fund managers' risk-taking behaviors, we further expect that the relations between local religious beliefs and mutual fund risk-taking behaviors are stronger for funds that tend to rely more on *local* money. In Section 4, we provide detailed evidence supporting this prediction.

3. Data and sample construction

3.1. Data sources

Our sample consists of two main components: i) county-level data on religious beliefs, and ii) mutual fund data. We obtain data on religious beliefs from the American Religion Data Archive (ARDA), which are also used by other studies such as Hillary and Hui (2009) and Kumar et al. (2010).[10] ARDA data are constructed based on three surveys in 1980, 1990, and 2000, which include 111, 133, and 149 Judeo-

[10] This dataset 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 (*www.theARDA.com*).

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.[11] We calculate religiosity ratios for each survey year (1980, 1990, 2000), and follow the literature (Alesina and La Ferrara, 2002; Hilary and Hui, 2009; Kumar et al., 2010) to linearly interpolate the ratios to the non-survey years during 1981–1999. We apply the religiosity ratios in 2000 for the 2001–2008 period.

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 information for each fund, we assign the domicile county's religiosity ratios to the fund.[12]

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). We merge CRSP fund returns data with fund holdings data from the Thomson Reuters Mutual Fund Holdings database using the linkage files from Wharton Research Data Services. 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 (Investment Objective Code = 2 or 3). Our final sample consists of 15,013 fund-year observations of actively managed mutual funds during 1988–2008. Some of our tests use the return gap measures proposed by Kacperczyk et al. (2008), which are obtained from the authors.[13]

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[11] 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., 2010), we combine Evangelical Protestants and Mainline Protestants to form the group of Protestant congregations.

[12] Our data on mutual fund locations contain zip code 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 companies located in different regions, we use the simple average of religiosity ratios.

[13] We thank Marcin Kacperczyk, Clemens Sialm, and Lu Zheng for making the return gap data publicly available at *http://www.rfs.org/txt/appendices/retgaprfs.zip*.

We control for a broad set of demographic variables throughout the paper. 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.[14]

3.2. Descriptive statistics

Figure 2 plots the geographic distribution of our sample funds for two snapshots: 1988 (Panel A) and 2000 (Panel B). Both figures show that our mutual fund sample is quite dispersed geographically. The highest concentrations are in 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.

< Figure 2 about here >

Table 1 reports the summary statistics of our mutual fund sample. A typical fund in our sample is located in a county with 57.44% of religious population, which consists of 15.02% Protestant population and 32.29% Catholic population. While 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 due to the fact that our mutual fund sample is tilted toward regions with relatively heavy Catholic populations, such as Boston and New York (both with about 40% Catholic population in 2000). 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*.[15]

[14] 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.

[15] Table 1 shows that about ten percent 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

< Table 1 about here >

We measure return volatility (*Volatility*) of each fund-year as the standard deviation of monthly fund returns during the year. A typical fund in our sample has a monthly return volatility of 4.99%. We further calculate idiosyncratic volatility (*Idiosyncratic Volatility*) as the volatility of the error terms from annual four-factor model regressions of monthly fund returns on the market portfolio, SMB, HML, and UMD. The idiosyncratic volatility of a typical fund is only 1.44%, suggesting that more than 90% of the total variation in fund returns can be attributed to the four price factors.[16] However, there is 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 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. Funds in our sample generally have relatively neutral factor loadings. A typical fund has a market beta of one, an HML loading of -0.02, and an UMD loading of 0.05. However, they tend to hold relatively small stocks. Their average SMB loading is 0.28. The return gap measure proposed by Kacperczyk et al. (2008) is related to aggressiveness of interim trading and 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. Since holdings are reported quarterly, the gap could be due to interim trading within a quarter (e.g., intra-quarter round trip trades) as well as transaction costs. Consistent with Kacperczyk et al. (2008), a typical fund in our sample does not have a significant return gap, with mean and median return gaps of only one basis point.

An average fund in our sample turns its portfolio over almost once a year, but the variation in fund turnover is quite significant. The 75th percentile (1.25 times per year) is almost four times the 25th percentile (0.33 times per year). Funds in our sample are relatively old and large, with a median age

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of each individual belief on risk-taking to be relatively small. Nevertheless, we note that prior evidence indicates that distinct risk attributes are associated with these religious beliefs. For example, as we noted earlier, Barsky et al. (1997) find that Jewish adherents have a higher risk tolerance than Catholics or Protestants.

[16] The fraction is calculated as: $1 - (1.44\%)^2/(4.99\%)^2 = 91.67\%$.

(*Fund Age*) of 8.3 years and a median size (*Fund Size*) of $241 million.[17] The median fund in our sample comes from a family with 24 funds (*# of Funds in Family*).

4. Mutual fund return volatilities and local religious beliefs

4.1. Portfolio analysis of return volatilities

We first form quintile portfolios of funds sorted on each of our religious ratios and then calculate the average return volatilities and idiosyncratic volatilities for each quintile. To control for fund style, we subtract from each volatility measure its sample median of all funds with the same objective in the same year. Table 2 reports the means and medians of fund return volatilities for quintile portfolios sorted on religiosity ratios. Panel A shows that fund return volatility decreases with *Protestant Ratio*. The difference between the highest and the lowest quintiles of *Protestant Ratio* is -0.28%, significant at the standard level (t = -2.96). The difference is also economically significant, representing about 15% of the standard deviation of adjusted return volatility for funds in our sample (1.89%). The median values also decrease monotonically from the lowest quintile of *Protestant Ratio* (0.05%) to the highest quintile (-0.09%).

< Table 2 about here >

For idiosyncratic volatility measures, the mean values decrease monotonically in *Protestant Ratio*, with a spread of -0.20% between the highest and the lowest quintiles. This spread represents about 20% of the sample standard deviation of adjusted 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 due to local religious beliefs can be attributed to idiosyncratic risk as opposed to systematic risk.

[17] The average fund age of our sample is higher than that of the mutual fund universe because of two reasons. First, we do not have location data for the short-lived funds that were founded and died between the two snapshots of fund location data, and these funds are therefore excluded from our sample. Second, to avoid survivorship bias, we apply fund location data forward to subsequent fund-year observations 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.

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 total and idiosyncratic volatilities. For instance, the mean spread of total volatility is 0.10% and statistically significant at the standard level (t = 2.92). The results in Panel A are consistent with our hypothesis that funds located in areas with higher Protestant population or lower Catholic population engage in less risk-taking behaviors.

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* (the bottom third of Panel A of Table 2). While the volatility measures decrease in *Total Religiosity Ratio*, the spreads between the top and the bottom quintiles are smaller than those obtained using *Protestant Ratio* and have conflicting signs relative to those obtained using *Catholic Ratio*. These results highlight the importance of considering the heterogeneity in religious beliefs in examining the effects of religious beliefs on speculative risk-taking.

Panel B shows sub-sample analysis of volatility measures. We find that the pattern of higher volatility for funds with low *Protestant Ratio* or high *Catholic Ratio* is more pronounced among smaller funds. This evidence is consistent with our prediction that local mutual fund investors impact fund risk-taking behaviors through flow-performance relations. Larger funds generally have a more diversified investor base which could make them less affected by local investors and in turn local religious beliefs. Since fund size may be related to a host of other fund characteristics, we perform more direct tests in Section 4.3 using two direct measures of reliance on local money. Our sub-period analysis further shows that the spreads for *Protestant Ratio* and *Catholic Ratio* do not disappear as the mutual fund industry gets more competitive over time, suggesting that the effects of religions on risk-taking are persistent.[18]

To address the concern that our results might be driven by New York and Boston areas which have both concentrated mutual funds and Catholic populations, we repeat our tests on fund volatility by excluding funds in the states of Massachusetts, New York, and Connecticut. These states have high

[18] The sub-sample split reflects our location data snapshots. The first twelve years use snapshots from 1988 and 1994, while the last nine years use snapshots from 2000 and 2007.

Catholic populations (about 40%, vs. only about 26% for the rest of our sample) and large numbers of mutual funds (about 40% of our sample funds). We find that after excluding these states, the differences in volatility and idiosyncratic volatility between funds in the highest and the lowest quintiles of Catholic or Protestant ratios are similar to the full sample in terms of both magnitudes and statistical significances (t-statistics between 2.08 and 3.82).

4.2 Regression analysis of fund return volatilities

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

$$Volatility_{i,t} \,/\, Idio.\ Volatility_{i,t} = \alpha_0 + \alpha_1 Religiosity\ Ratio_{i,t} + \alpha^j\, Fund_{j,i,t} + \alpha^k\, Demo_{k,i,t} + \alpha^l\, Year \times Style_{l,i,t} + \varepsilon_{1,i,t} \quad (1)$$

where *Volatility*, *Idio. Volatility*, and *Religiosity Ratio* are the total volatility, idiosyncratic volatility, and religiosity ratios, respectively, as defined in Section 3. We expect α_1 to be negative for *Protestant Ratio* but positive for *Catholic Ratio*.[19]

Fund is a vector of fund characteristics including *Fund Size*, *Fund Age*, and *# Funds in Family* (each defined in Section 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 risk 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 including *Age*, *Education*, *Income*, *Population*, *Population Density*, *Mf*, *Minority*, and *Married* (also defined in Section 3). As religious affiliation correlates with ethnicity, migration, education, and economic status, we control for these variables to ensure that we capture the marginal effects of religiosity ratios rather than their correlations with demographic characteristics. One might expect that risk-taking behaviors are more pervasive among

[19] We also present results when we use the *Total Religiosity Ratio* as the main variable. However, our theory does not give us clear predictions on the results.

the higher educated and male but less so for minority and married households (Barsky et al., 1997). We are controlling for population density as Christoffersen and Sarkissian (2009) find that risk-taking behaviors are related to measures of urban concentration. Finally, we include style-year fixed effects to control for potential heterogeneity in risk-taking behaviors across fund objectives and over time. We report robust t-statistics with clustered standard errors at the style-year level.

< Table 3 about here >

Table 3 presents the coefficients and the associated t-statistics from the regressions. Consistent with our univariate results from the portfolio analysis in Table 2, the coefficients for *Protestant Ratio* are significantly negative. In particular, in the *Volatility* regression, the coefficient for *Protestant Ratio* is -0.58%, statistically significant at the standard level (t = -2.44). In the *Idiosyncratic Volatility* regression, the corresponding coefficient is -0.46% with a *t*-statistic of -4.16. In addition, the coefficients for *Catholic Ratio* are positive and statistically significant in both regressions, with the magnitude in the *Total Volatility* regression larger than that in the *Idiosyncratic Volatility* regression.

We find positive coefficients for *Total Religiosity Ratio*, which are opposite to the negative univariate relation we document in Table 2. Further (untabulated) analysis suggests that this discrepancy results entirely from the cross-correlations between *Total Religiosity Ratio* and the demographic variables. As such, it is comforting that the results for *Protestant Ratio* and *Catholic Ratio* are robust after controlling for these demographic variables. The coefficients of fund characteristics are generally consistent with our expectations. The coefficients for *Fund Size* and *Fund Age* are negative, consistent with lower risk-taking incentives for larger funds and older funds. For demographic variables, the consistent coefficients for *Mf* and *Married* suggest higher return volatilities for funds in counties with higher male population and fewer married households. We also find that, after controlling for religiosity ratio, higher population densities tend to be associated with lower fund volatilities, suggesting that funds located in urban areas take less risk than those located in less populated areas.

Overall, we document strong evidence that funds in counties with lower Protestant ratio or higher Catholic ratio have higher total and idiosyncratic return volatilities. This relation is robust after

controlling for fund characteristics or demographic variables, persistent over time, and more pronounced among smaller funds.

4.3. Local money and the effects of local religiosity ratios on fund return volatilities

We propose that implicit incentive contracts serve as a channel that translates local individuals' risk attitudes into organizational behavior. In particular, we predict that the effects of local religious beliefs on mutual fund risk-taking behaviors are stronger for funds that tend to rely more on local money. We use two different measures of reliance on local money. First, we use the local density of mutual funds, which is measured as the aggregate assets of mutual funds in a county divided by that county's aggregate personal income. When a fund is located in an area with high mutual fund density, the fund is less likely to be supported by ample local money. Second, we use the fund's marketing expense, which is measured as the fund's 12b-1 fee divided by total net assets. When a fund exerts more marketing effort to obtain a wider potential investor base, it is less likely to rely on local money.

Consistent with our prediction, Panel A of Table 4 shows evidence that the differences in return volatilities are associated with the incentives deriving from local fund flows. We find that the pattern of higher volatilities for funds with low *Protestant Ratio* or high *Catholic Ratio* is more pronounced among funds in low density areas or funds spending less marketing effort. Specifically, for both Protestant and Catholic ratios, the differences in volatility measures between the highest and the lowest quintiles of religiosity ratios are large and significant for funds with low local fund density or low marketing expenses. In contrast, the corresponding differences are much smaller and generally insignificant among funds with high local fund density or high marketing expenses.

< Table 4 about here >

We further estimate the following multivariate regression to examine the robustness of the bivariate results reported in Panel A:

$$Volatility_{i,t} \ / \ Idio.\ Volatility_{i,t} = \beta_0 + \beta_1 Religiosity\ Ratio_{i,t} + \beta_2 Religiosity\ Ratio_{i,t} \times Non\text{-}Local\ Flows_{i,t} + \beta_3 Non\text{-}Local\ Flows_{i,t} + \beta^j\ Fund_{j,i,t} + \beta^k\ Demo_{k,i,t} + \beta^l\ Year \times Style_{l,i,t} + \varepsilon_{2,i,t} \quad (2)$$

where *Non-Local Flows* is defined as local fund density or marketing expenses, and all other variables are defined previously. Because we expect the effects of religiosity on risk-taking behaviors to be more pronounced when funds rely more on local money, we predict the coefficients for *Religiosity Ratio*×*Non-Local Flows* to be opposite to the coefficients for *Religiosity Ratio*.

Panel B of Table 4 reports regression estimates, and the results support our bivariate findings. For example, we find a negative coefficient for *Protestant Ratio* but a positive coefficient for the interaction of *Protestant Ratio* with *Local Fund Density* (t = 2.98). Similarly, in models 2 and 4 we find a positive coefficient for *Catholic Ratio* but a negative coefficient for the interaction of *Catholic Ratio* with *Local Fund Density* ($t \leq$ -3.57). The results are similar when we proxy non-local flows with marketing expenses. These results are consistent with the bivariate results in Panel A in that the effects of local religious beliefs on mutual fund risk-taking behaviors are stronger for funds that are likely to rely more on local money. These results are consistent with our hypothesis that implicit compensation contracts serve as a channel that translates local individuals' risk attitudes into organizational behavior.

4.4. Effects of aversion to pure risk on fund return volatilities

In this section, we examine the distinct effects of religiosity on speculative risk and pure risk. In particular, we predict that the speculative risk-taking behaviors associated with religious beliefs are less pronounced when the aversion to pure risk shared by all religious beliefs becomes a more significant component of managers' decision making. To proxy for heightened pure risk, we use poor market conditions in which mutual fund managers face higher risk of losing their jobs (Kempf et al., 2009). Poor market conditions heighten employment risk, which represents greater pure risk as there is no chance of gain from losing one's job. We focus on the Catholic belief because of its opposite relations with pure risk and speculative risk. We estimate the following multivariate OLS regressions:

$$Volatility_{i,t}\ /Idio.\ Volatility_{i,t} = \gamma_0 + \gamma_1 Catholic\ Ratio_{i,t} + \gamma_2 Catholic\ Ratio_{i,t} \times HighPureRisk_t + \gamma_3 HighPureRisk_t + \gamma^j\ Fund_{j,i,t} + \gamma^k\ Demo_{k,i,t} + \gamma^l\ Year \times Style_{l,i,t} + \varepsilon_{3,i,t} \quad (3)$$

where *HighPureRisk* is a dummy variable equal to one if the observation is in a year of high employment risk due to poor market conditions. For robustness we use three definitions of poor market conditions –

negative mid-year returns, negative annual returns, and the period following the tech bubble (years 2000, 2001 and 2002). All the other variables are defined in Section 3.[20] In this regression, we expect the coefficients for the interaction terms of *Catholic Ratio* with proxies for *HighPureRisk* (α_2) to be negative.

Consistent with our expectation, Panel A of Table 5 reports that all regressions with *Volatility* as the dependent variable have negative coefficients for the interaction terms of *Catholic Ratio* with each proxy for higher pure risk (*Negative Mid-Year Return*, *Negative Full-Year Return*, *Post-Bubble Period*). The estimated coefficients are statistically significant at conventional levels ($t \leq$ -1.86). The point estimates of the interaction terms are almost as large as those of *Catholic Ratio*, indicating that the common aversion to pure risk completely negates the positive relation between Catholicism and speculative risk.

< Table 5 about here >

Panel B reports the regression results when *Idiosyncratic Volatility* is the independent variable. Similar to the results in Panel A, we find negative and statistically significant coefficients for the interaction terms of *Catholic Ratio* with all three proxies for higher pure risk ($t \leq$ -1.92). Unlike in the volatility regression, the point estimates or the interaction terms are smaller than those of *Catholic Ratio*. The differences in the relative magnitudes between Panels A and B suggest that common aversion to pure risk manifests more in managers' reluctance to take on systematic risks than in their hesitation to take on idiosyncratic risks.

Overall, Table 5 presents strong evidence 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 preferences for speculative risk associated with religious beliefs.

4.5. Are higher volatilities associated with higher returns?

Since our analyses show that funds located in areas of low Protestant (or high Catholic) populations engage in more risk-taking, a natural question is how such risk-taking affects mutual fund performance.

[20] *HighPureRisk* is not included in the multivariate regressions as its effect is absorbed by the *Year*×*Style* fixed effects.

We sort funds into quintiles of religiosity ratios and report in Table 6 the average monthly returns for each quintile. We report both raw returns calculated as the annual average of monthly fund return (*Fund Return*) and the *Four-Factor Alpha* estimated with annual four-factor regressions of monthly fund returns (Carhart, 1997). We also report factor loadings from the annual regressions. For each variable of interest (raw fund returns, fund alphas, and loadings), we adjust for investment objective by subtracting the annual median value of funds with the same investment objective code.

< Table 6 about here >

Table 6 shows that raw fund returns decrease in *Protestant Ratio* but this relation is not monotonic. The spread between the top and bottom quintiles is about -9 basis points per month (or slightly above -1% per year). However, 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 (-1 basis point per month). Therefore, the differences in raw fund returns can be completely explained by the differences in factor loadings. Funds in the lowest *Protestant Ratio* quintile tend to have significantly higher loadings on the *SMB* and *HML* factors than those in the highest quintile, suggesting that funds with low *Protestant Ratio* tilt their portfolios more heavily toward stocks with smaller market capitalizations and higher book-to-market ratios.

In addition, Table 6 shows that neither raw fund returns nor alphas vary significantly across *Catholic Ratio*. For factor loadings, the only statistically significant result is that the *SMB* loadings are lower for funds with lower *Catholic Ratio*.[21] Fund performances do not seem to vary across *Total Religiosity Ratio*, either. In untabulated results, we further show little variation in fund performance across religiosity ratios for different sub-periods or sub-samples based on fund size or fund age. Our untabulated results of multivariate regressions of return measures also show that the lack of variation in fund performance is persistent after we control for a broad set of fund characteristics and demographic variables. In sum, Table 6 shows that the higher return volatilities of funds in counties with lower Protestant population or

[21] Interestingly, given that our sample is comprised of growth and aggressive growth funds, the variation in HML loading suggests that deviation from investment objective is decreasing in *Protestant Ratio* and increasing in *Catholic Ratio.*

higher Catholic population are not rewarded by higher returns. Our results are consistent with prior results that mutual funds on average fail to deliver positive returns, reflecting a lack of stock picking ability for fund managers in general.

5. Multiple dimensions of mutual fund risk-taking behaviors

Our earlier analyses on fund return volatilities document that mutual funds in counties with lower proportion of Protestant population (or higher proportion of Catholic population) tend to have greater volatilities. In addition, these relations are weaker when funds are less likely to rely on local money and when managers are more concerned with general employment risk. In this section, we complement our volatility results by examining specific risk-taking behaviors that may cause the variation in fund return volatilities. These behaviors include tournament competition, concentrated fund holdings, and aggressive interim trading.

5.1. Tournament risk-taking behavior

The conflict of interests between mutual fund investors and managers poses a classical agency problem in mutual fund industry: While investors demand managers to maximize risk-adjusted returns, fund managers may have incentives to take excessive risks. Brown et al. (1996) and Chevalier and Ellison (1997) argue that changes in fund volatility during a year tend to be conditional on mid-year fund performance. Because fund managers face a tournament-like environment in which annual winners take much of the reward (i.e., in terms of money inflow and compensation) but losers do not face harsh punishment, losers at the mid-year have strong incentives to take risk in the latter period of the year. We therefore predict that intra-year increases in fund volatilities resulting from tournament-like competition are associated with local religious beliefs. Specifically, conditional on mid-year performance, the tendency of increasing fund volatility in the remaining months of the year should be higher (lower) for funds located in areas with lower Protestant ratio (Catholic ratio).[22]

[22] Recent studies find mixed evidence on the tournament hypothesis. Busse (2001) shows that tournament pattern disappears with daily mutual fund returns. However, Chen and Pennacchi (2009) find evidence supporting the

Following prior studies, we use a standard deviation ratio (SDR) analysis to test the relation between tournament risk-taking behavior and religious beliefs. Specifically, the tournament hypothesis predicts the following:

$$\frac{\sigma_{2,L}}{\sigma_{1,L}} > \frac{\sigma_{2,W}}{\sigma_{1,W}} \tag{4}$$

where $\sigma_{i,j}$ denotes the standard deviation of mutual fund j's return during the ith half of the year, and mutual fund $j = L$ (a "loser") when the fund has experienced relatively poor performance in the first half of the year and mutual fund $j = W$ (a "winner") when it has had good performance during the first half of the year. This test formalizes the intuition that a mid-year loser is more likely to take risk than a mid-year winner is. 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 (i.e., fund return in excess of equal-weighted return of funds with the same style).

We present the frequencies for each assessment window and the corresponding Chi-square statistics in Table 7. Panel A presents the frequencies for tercile portfolios of funds based on *Protestant Ratio.* We find strong evidence of tournament risk-taking behavior for funds in low and medium *Protestant Ratio* tercile portfolios. Specifically, in these two portfolios, 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, for these two portfolios, 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. Overall, the results in Panel A of Table 7 support our prediction that the tendency of increasing

tournament hypothesis in terms of tracking error. They suggest that in recent periods, tournament behavior is caused by competition among funds within the same investment style.

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

fund volatility in the remaining months of the year conditional on poor mid-year performance is lower for funds in counties with higher *Protestant Ratio*.

< Table 7 about here >

Panel B presents the analogous results for funds sorted on *Catholic Ratio*. The results show that tournament behavior is mainly concentrated in medium and high *Catholic Ratio* portfolios. In the low *Catholic Ratio* portfolio, none of the Chi-square statistics is close to being significant, suggesting little to no increase in risk conditional on mid-year performance.[24] Since Panels A and B report frequencies of observation over all years, the results could be driven by the later years in which we have more fund observations. We therefore calculate cell frequencies for each year and tabulate the averages of yearly frequencies in Panel C. For brevity, we report only the frequencies for "Low Return" cells. Consistent with Panels A and B, the differences in cell frequencies between the top and bottom terciles of Protestant Ratio are statistically significant for all assessment periods. The results for *Catholic Ratio* are also consistent with, albeit slightly weaker than, the results based on the pooled sample. Overall, Table 7 provides evidence that is consistent with our prediction that tournament risk-taking behaviors are stronger (weaker) for funds located in areas with lower Protestant ratio (Catholic ratio).

5.2. Volatilities of holding-based returns

We further explore whether the relation between fund return volatility and local religious beliefs is primarily driven by *fund holdings* and/or fund *trading activities*. Specifically, we perform analyses on mutual funds' holdings-based risk characteristics including volatilities of holding-based returns, portfolio diversification, and average volatility/skewness of individual stocks held by funds.

We first examine whether the (hypothetical) holdings-based return volatilities are higher for funds with low *Protestant Ratio* or high *Catholic Ratio*. For each fund, we first estimate the hypothetical holdings-based return as the buy-and-hold return calculated based on its most recently reported stock

[24] We also examine tournament risk-taking behavior associated with *Jewish Ratio*. Consistent with Barsky et al. (1997), funds located in regions of higher Jewish ratio have higher return volatilities than funds with lower Jewish ratios. Funds with higher Jewish ratio also exhibit stronger tournament risk-taking behaviors than funds with lower Jewish ratio but this association is weaker than those of Protestant ratio and Catholic ratio.

holdings.[25] We then calculate the holdings-based total and idiosyncratic return volatilities using these hypothetical holdings-based returns.

< Table 8 about here >

Panel A of Table 8 reports total and idiosyncratic volatilities of holdings-based fund returns for quintiles of *Protestant Ratio*. There is a statistically significant difference in holdings-based return volatility between the top and bottom *Protestant Ratio* quintiles. However, the magnitude of this spread (-0.13%) is less than half of the spread obtained using actual fund returns (-0.28%, Panel A of Table 2). Similarly, the spread in holding-based idiosyncratic volatility (-0.12%, t-statistic -6.68) is only about 60% of the spread obtained using actual fund returns (-0.20%). These results indicate that the differences in fund return volatilities sorted on *Protestant Ratio* are driven by both fund holdings and interim trading activities. We also find that both total and idiosyncratic holdings-based volatilities are significantly greater for funds in the highest *Catholic Ratio* quintile than those in the lowest *Catholic Ratio* quintile. Similar to Table 2, the total and idiosyncratic holdings-based volatilities are significantly different between the top and bottom quintiles of *Total Religiosity Ratio*.

Next, we explore whether the differences in holdings-based return volatilities across religiosity ratios are due to funds holding stocks with higher return volatilities, funds holding less diversified portfolios, or a combination of both. Panel B of Table 8 shows no difference in the average return volatilities or skewness of the *individual stocks* held by funds across religiosity ratios, suggesting that the difference in holdings-based volatility is likely due to the lack of portfolio diversification.

To shed more light on portfolio diversification, we 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 industry concentration ratio, defined as the sum of squared differences between a fund's industry weights and the corresponding market's industry weights. Panel C of Table 8 shows that both concentration measures are higher for funds with lower *Protestant Ratio*, indicating that these funds tend to deviate from a well-diversified portfolio and

[25] 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.

concentrate in fewer industries. In addition, the concentration measures are increasing in *Catholic Ratio*. Overall, the results in Panels B and C indicate that greater holdings-based return volatilities of funds with low *Protestant Ratio* or high *Catholic Ratio* are primarily attributable to a lack of portfolio diversification as opposed to higher portfolio weights in stocks with more volatile returns.

5.3. Turnover activities

The results in the previous subsection indicate that holdings-based return volatility only partially explains the difference in fund-level return volatility across religious ratios, which suggests that the interim trading of mutual funds may also contribute to the difference in fund return volatility. In this subsection, we analyze portfolio turnover and return gap as a function of local religiosity ratios. Financial researchers have long examined the variation in mutual fund portfolio turnovers (Grinblatt and Titman, 1989; Carhart, 1997; Chen, Jegadeesh, and Wermers, 2000). Facing uncertainty, a more risk-averse manager would trade less aggressively and therefore less frequently than does a more risk-tolerant manager. In our context of local religious beliefs, we predict that funds located in areas with lower Protestant ratios or higher Catholic ratios have higher portfolio turnover ratios.

We collect fund-level annual portfolio turnover ratio from CRSP Mutual Fund database, which captures the number of times a mutual fund turns its holdings over. Panel A of Table 9 shows that, consistent with our expectation, 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 significant (t = -3.51) and economically significant, representing a 28% decrease from the lowest to the highest quintile. These results indicate that funds located in counties with lower *Protestant Ratios* trade more frequently on annual basis. In addition, we observe a positive but weaker association between turnover and *Catholic Ratio* but no clear pattern across quintile portfolios sorted on *Total Religiosity Ratio*.

< Table 9 about here >

Panel B of Table 9 further reports multivariate regressions of turnover on religiosity ratios that control for fund characteristics and county-level demographical characteristics. We expect the coefficients to be

negative for *Protestant Ratio* and positive for *Catholic Ratio*. If turnover represents aggressive trading associated with speculative risk-taking, we predict lower turnover for larger (*Fund Size*) and older funds (*Fund Age*) as they are relatively more established. On the other hand, we expect a positive coefficient for *# of Funds in Family*, as the pressure of intra-family competition may encourage more risk-taking behaviors. The regression results are consistent with the univariate results reported in Panel A. Specifically, we find a negative coefficient for *Protestant Ratio* (-1.08) with t-statistic of -3.00. Similarly, we find a positive coefficient for *Catholic Ratio* (1.18) with t-statistic of 5.60. The coefficients of fund characteristics are generally consistent with our expectations. We find significantly negative coefficients for *Fund Size* and significantly positive coefficients for *# Funds in Family*, which indicate that smaller funds and funds with greater within-family competition tend to trade more frequently.

5.4. Return gap

Turnover can in turn affect the return gap measure proposed by Kacperczyk et al. (2008), which captures the hidden benefits and costs of interim trading over a quarter. If return gap is caused by fund managers making profits on interim trades, a higher propensity to trade will lead to a positive return gap. On the contrary, if return gap is caused by the trading costs associated with interim trading, then a higher propensity will lead to a negative return gap. In the former (latter) case, we would expect funds with higher *Protestant Ratio* (or lower *Catholic Ratio*) to have lower (higher) return gaps.

Following Kacperczyk et al. (2008), we define return gap as the difference between net investor return and the net holding return:

$$Return\ Gap_t = Return\ of\ Fund_t - (Return\ of\ Holding_t - Fund\ Expense_t) \quad (6)$$

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.

< Table 10 about here >

Panel A of Table 10 reports the mean values of monthly return gaps for quintile portfolios of funds sorted by religiosity ratios. We find strong variation in monthly return gaps among funds sorted on *Protestant Ratio*. Moving from funds in the lowest *Protestant Ratio* quintile to those in the highest *Protestant Ratio* quintile, monthly return gap decreases from 4.61 basis points per month to -1.70 basis points per month. The difference of 6.31 basis points is statistically significant and corresponds to an annual return gap of 0.75%. Moreover, this difference represents almost 40% of the difference between funds in the top and bottom quintiles of past return gap (about 16-17 bps monthly, as reported in Table 3 of Kacperczyk et al., 2008). On the other hand, we do not observe any strong patterns when funds are sorted based on *Catholic Ratio* or *Total Religiosity Ratio*.

We further estimate multivariate regressions of return gap on religiosity ratios that control for fund characteristics and demographic variables. We predict the coefficients to be negative for *Protestant Ratio* and positive for *Catholic Ratio*. Parallel to our previous arguments, we predict that the lower turnover for large (*Fund Size*) and older funds (*Fund Age*) should result in lower return gap. On the other hand, we expect a positive coefficient for *# of Funds in Family* because more aggressive trading of these funds leads to higher return gap.

Results in Panel B of Table 10 show that monthly return gaps are negatively associated with *Protestant Ratio* (-0.16%), with a t-statistic of -2.26. This result is comparable to the univariate result reported in Panel A. We also find a positive coefficient for *Catholic Ratio*, although smaller in magnitude and statistically insignificant with a t-statistic of 1.62. The coefficient for *Total Religiosity Ratio* is statistically significant, but with an opposite sign from the univariate result. Among the three fund characteristic variables, we find consistent and significantly negative coefficients for *Fund Age*, consistent with older funds being less aggressive in generating values relative to a simple buy-and-hold strategy.

Overall, we find that managers of funds in areas of low Protestant population (or high Catholic population) trade more frequently and have higher return gaps. These results are consistent with variations in interim trading also contributing to the variations in fund return volatilities across local religiosity ratios.

6. Conclusion

We study the impacts of religious beliefs on organizational risk-taking behaviors in mutual fund settings. We posit an important distinction between aversion to pure risk common to all religious beliefs and different preferences for speculative risk between Protestant and Catholic beliefs. We predict diverging effects of Protestant and Catholic beliefs on mutual fund risk-taking behaviors because mutual funds' risk-taking primarily reflects speculative risk. In addition, we predict that due to the common aversion to pure risk in all religious beliefs, the diverging effects of religious beliefs on speculative risk-taking behaviors are mitigated when there is a heightened pure risk. Our results based on mutual fund return volatilities support our predictions. We further document strong associations between local religious beliefs and important dimensions of mutual fund risk-taking behaviors including tournament behavior, industry concentrations of fund portfolios, fund turnovers, and return gap

We also demonstrate that implicit compensation contracts serve as an important channel through which local religious beliefs affect risk-taking behaviors. We show that the convexity of flow-performance relations varies with local religious beliefs and that the effects of local religious beliefs on mutual funds' risk attitudes are stronger for funds that rely more on local money. Our findings shed light on the channels through which local religious beliefs affect organizational risk-taking behaviors, a necessary link for local religions to influence organizational behaviors. While our evidence comes from the mutual fund contracting environment, it highlights the importance of compensation contracts in the relation between local religious beliefs and managerial decision making in other organizational forms.

Furthermore, our paper makes important contributions to the mutual fund literature by showing that heterogeneity in geographical locations is an important factor that contributes to the well-documented variations in mutual fund risk-taking behaviors. We document that local religious beliefs have significant effects on variation in return volatility, tournament-related competition, industry concentration of fund portfolio, fund portfolio turnover, and return gap. Our study also contributes to the research on mutual fund location by showing the association between the local religious beliefs at a fund's location and the fund's risk-taking behaviors.

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Table 1
Summary statistics

Our sample includes mutual funds at the intersection of Thomson Reuters Mutual Fund Holdings database and the CRSP Mutual Fund database from 1988–2008. To ensure that our sample comprises of actively managed equity funds, we include only funds whose objectives are identified by Thomson Financial 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 regressions 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*. *Return Gap* of a fund 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 TNA of the fund. # *Funds in Family* for a fund is the number of funds within the same management company as the fund.

				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
	Return Gap	0.01	1.47	-1.59	-0.34	0.01	0.38	1.60
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
	# of Funds in Family	53.86	70.67	1	6	24	74	211

Table 2
Fund return volatilities sorted on religiosity ratios

This table reports average fund return volatilities and 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 values within the fund's investment objective code. Each year from 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 volatility measures for each quintile, and report the time-series means for each quintile in Panel A. We also report the differences between the top and bottom quintiles of religiosity ratios and the associated t-statistics (in parentheses). Panel B presents the volatility measures for sub-samples based on *Fund Size* as well as sub-periods (1988–1999 and 2000–2008). For brevity we only report the differences between the top and bottom quintiles of religiosity ratios. *Fund Size* is total net assets (TNA) of a fund. ***, **, * indicate statistical significance at the two-tailed 1%, 5%, and 10% levels, respectively.

Panel A: Volatilities Sorted on Religiosity Ratios: Full Sample

	Low	2	3	4	High	H-L	t-stat
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: Differences in Volatilities Between Funds with High and Low Religiosity Ratios: Sub-Samples

	Fund Size			**Sub-Period**	
	Small	Medium	Large	1988–1999	2000–2008
Sorted on Protestant Ratio					
Mean Volatility	-0.37%***	-0.22%***	-0.33%	-0.33%*	-0.22%*
Mean Idiosyncratic Volatility	-0.14%***	-0.22%***	-0.28%	-0.28%**	-0.09%***
Sorted on Catholic Ratio					
Mean Volatility	0.23%*	0.23%***	0.11%**	0.07%	0.15%***
Mean Idiosyncratic Volatility	0.22%***	0.18%***	0.05%	0.08%***	0.12%***
Sorted on Total Religiosity Ratio					
Mean Volatility	0.22%***	-0.15%*	-0.14%	-0.15%	-0.12%
Mean Idiosyncratic Volatility	0.04%	-0.09%***	-0.18%	-0.19%**	-0.02%

Table 3
Panel regressions of volatilities on religiosity ratios

This table reports multivariate 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 total net assets (TNA) of the fund. # *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 US 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. 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 standard errors clustered at the year×fund-objective level. ***, **, * indicate statistical significance at the two-tailed 1%, 5%, and 10% levels, respectively.

	Dependent Variable: Volatility			**Dep. Variable: Idiosyncratic Volatility**		
	Protestant	**Catholic**	**Total Religiosity**	**Protestant**	**Catholic**	**Total Religiosity**
Religiosity Ratio	-0.5772**	0.5098***	0.6894***	-0.4587***	0.3539***	0.3402***
	(-2.44)	(3.76)	(3.80)	(-4.16)	(5.47)	(4.23)
Log (Fund Size, in $M)	0.0060	0.0061	0.0059	-0.1000***	-0.1000***	-0.1001***
	(0.27)	(0.27)	(0.27)	(-9.98)	(-9.94)	(-9.87)
Log (Fund Age, in Years)	-0.3221***	-0.3258***	-0.3258***	-0.0346	-0.0372	-0.0366
	(-3.74)	(-3.77)	(-3.76)	(-1.10)	(-1.18)	(-1.16)
Log (# Funds in Family)	-0.0390***	-0.0401***	-0.0379***	-0.0066	-0.0071	-0.0053
	(-3.08)	(-3.04)	(-2.82)	(-0.89)	(-0.95)	(-0.71)
Dem.: Age	0.0423**	0.0497***	0.0577***	-0.0068	-0.0010	0.0029
	(2.68)	(3.39)	(3.61)	(-1.17)	(-0.18)	(0.52)
Dem.: Education	0.0029	0.0021	0.0023	0.0040*	0.0035*	0.0039*
	(0.75)	(0.54)	(0.60)	(1.83)	(1.77)	(1.97)
Dem.: Income	0.0000	0.0000	0.0000	0.0000**	0.0000**	0.0000**
	(0.97)	(0.90)	(0.85)	(2.26)	(2.18)	(2.13)
Dem.: Log (Population)	-0.0177	-0.0282	-0.0211	-0.0351***	-0.0405***	-0.0309***
	(-0.98)	(-1.45)	(-1.05)	(-3.02)	(-3.27)	(-2.76)
Dem.: Mf	5.7307***	6.4507***	7.1933***	1.8781***	2.4372***	2.7771***
	(4.01)	(4.78)	(4.91)	(3.60)	(4.67)	(4.83)
Dem.: Minority	-0.2939	-0.1609	-0.2842	-0.1198	-0.0441	-0.1649
	(-1.10)	(-0.60)	(-0.97)	(-0.81)	(-0.30)	(-1.30)
Dem.: Married	-2.3480***	-2.4595***	-3.0119***	-1.3322***	-1.4684***	-1.8360***
	(-3.55)	(-4.13)	(-5.09)	(-3.32)	(-4.09)	(-5.11)
Dem.: Population Density	-4.1851	-3.5655	-4.9985	-5.9306***	-5.4987***	-6.3266***
	(-1.11)	(-0.94)	(-1.27)	(-3.59)	(-3.26)	(-3.58)
*(*Year×Fund-Objective*)* *Fixed Effects*	Yes	Yes	Yes	Yes	Yes	Yes
N(Years)	21	21	21	21	21	21
Obs	13,733	13,733	13,733	13,733	13,733	13,733
R^2	0.487	0.487	0.487	0.232	0.232	0.232

Table 4
Effects of local money on the relations between fund return volatilities and religious ratios

Panel A presents the differences in fund return volatilities between funds with high and low religiosity ratios for sub-groups formed based on proxies of local money. *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). Each year from 1988–2008, we sort funds into quintiles of religiosity ratios of fund locations for the sub-samples based on proxy for non-local flows (*Local Fund Density* or *Marketing Expenses*). We then calculate the annual means of the volatility measures for each quintile, and report the time-series means and t-statistics of the differences between the top and bottom quintiles of religiosity ratios. *Local Fund Density* is the aggregate assets of mutual funds in a county divided by that county's aggregate personal income (i.e., the mean per capita personal income multiplied by the total county population). Low fund density corresponds to funds in the bottom third of the Local Fund Density annually, while High fund density corresponds to the rest of the funds. A fund's *Marketing Expense* is its 12b-1 fees divided by total net assets. High expense corresponds to funds in the top third annually; while the rest of the funds are categorized as Low expense. Panel B presents the estimates from multivariate regressions that are similar to those in Table 3 with the addition of interaction variable between each religious ratio and each proxy for non-local flows (*Local Fund Density* or *Marketing Expense*). We include the proxy, demographic variables and year×fund-objective fixed effects in each regression, but for brevity do not tabulate the estimates for these variables. The parameter estimates are reported in percentages. The t-statistics (in parentheses) are calculated using standard errors clustered at the year×fund-objective level. ***, **, * indicate statistical significance at the two-tailed 1%, 5%, and 10% levels, respectively.

Panel A: Bivariate Sort on Religious Ratios and Proxies for Non-Local Flows

	Local Fund Density		Marketing Expense	
	Low	High	Low	High
Sorted on Protestant Ratio				
Mean Volatility	-0.33%**	-0.03%	-0.23%**	-0.04%
Mean Idiosyncratic Volatility	-0.11%	-0.11%	-0.16%**	-0.03%
Sorted on Catholic Ratio				
Mean Volatility	0.41%***	-0.07%	0.36%***	0.16%**
Mean Idiosyncratic Volatility	0.20%***	0.07%**	0.19%**	0.07%*
Sorted on Total Religiosity Ratio				
Mean Volatility	-0.03%	0.11%	-0.14%*	0.05%
Mean Idiosyncratic Volatility	-0.07%	0.02%	-0.04%	-0.07%

Panel B: Multivariate Analysis with Interaction Variables with Non-Local Flows

Proxy for Non-Local Flows:	**Local Fund Density**				**Marketing Expense**			
	Volatility		Idio. Volatility		Volatility		Idio. Volatility	
Independent Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Protestant Ratio	-0.3562		-0.2873**		-0.9088***		-0.5315***	
	(-1.45)		(-2.28)		(-3.27)		(-4.08)	
Protestant Ratio × Non-Local Flows	0.3957***		0.2303***		1.7535***		0.4308	
	(2.98)		(4.39)		(3.52)		(1.26)	
Catholic Ratio		0.3189**		0.1749**		0.8059***		0.5204***
		(2.37)		(2.15)		(2.93)		(4.94)
Catholic Ratio × Non-Local Flows		-0.2108***		-0.1046***		-2.1021*		-1.2912***
		(-3.57)		(-4.44)		(-1.74)		(-3.01)
Fund Characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demographic Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
*(*Year×Fund-Objective*) F.E.*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N(Years)	21	21	21	21	21	21	21	21
Obs	13,718	13,718	13,718	13,718	13,728	13,728	13,728	13,728
R^2	0.488	0.488	0.235	0.235	0.488	0.488	0.233	0.234

Table 5
Effects of employment risk on the relations between Catholic ratio and return volatilities

This table reports multivariate regressions of mutual fund return volatilities for the sample period of 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 mid-year market return (Model 1), negative full-year market return (Model 2), or the post-tech bubble period (Model 3). We include demographic variables and year×fund-objective fixed effects in each regression, but for brevity do not tabulate the estimates for these variables. The parameter estimates are reported in percentages. The t-statistics (in parentheses) are calculated using standard errors clustered at the year×fund-objective level. ***, **, * indicate statistical significance at the two-tailed 1%, 5%, and 10% levels, respectively.

Panel A: Fund Volatility

Independent Variables	Model 1	Model 2	Model 3
Catholic Ratio	0.7443***	0.7133***	0.7141***
	(5.14)	(4.96)	(5.05)
Catholic Ratio × Negative Mid-Year Return	-0.6927**		
	(-2.11)		
Catholic Ratio × Negative Full-Year Return		-0.6272*	
		(-1.86)	
Catholic Ratio × Post-Internet Bubble Period			-0.7196*
			(-1.92)
Log (Fund Size, in $M)	0.0060	0.0061	0.0060
	(0.27)	(0.27)	(0.27)
Log (Fund Age, in Years)	-0.3252***	-0.3254***	-0.3255***
	(-3.76)	(-3.76)	(-3.76)
Log (# Funds in Family)	-0.0399***	-0.0399***	-0.0399***
	(-3.03)	(-3.03)	(-3.04)
Demographic Variables	Yes	Yes	Yes
*(*Year×Fund-Objective*) Fixed Effects*	Yes	Yes	Yes
N(Years)	21	21	21
Obs	13,733	13,733	13,733
R^2	0.488	0.487	0.488

Panel B: Fund Idiosyncratic Volatility

Independent Variable	Model 1	Model 2	Model 3
Catholic Ratio	0.4159***	0.4058***	0.4158***
	(4.65)	(4.68)	(4.90)
Catholic Ratio × Negative Mid-Year Return	-0.1833**		
	(-2.11)		
Catholic Ratio × Negative Full-Year Return		-0.1600*	
		(-1.92)	
Catholic Ratio × Post-Bubble Period			-0.2180***
			(-2.99)
Log (Fund Size, in $M)	-0.1000***	-0.1000***	-0.1000***
	(-9.95)	(-9.95)	(-9.96)
Log (Fund Age, in Years)	-0.0370	-0.0371	-0.0371
	(-1.18)	(-1.18)	(-1.18)
Log (# Funds in Family)	-0.0071	-0.0071	-0.0071
	(-0.94)	(-0.94)	(-0.94)
Demographic Variables	Yes	Yes	Yes
*(*Year×Fund-Objective*) Fixed Effects*	Yes	Yes	Yes
N(Years)	21	21	21
Obs	13,733	13,733	13,733
R^2	0.232	0.232	0.232

Table 6
Returns and factor loadings sorted on religiosity ratios

This table reports average mutual fund return, alpha, and factor loadings across religiosity ratios. *Fund Return* of a fund is annual average of monthly returns of the fund. We use annual four-factor model regressions of monthly fund returns (Carhart, 1997) to obtain *Alpha* as the intercept, and loadings on the market portfolio (*Beta*), *SMB*, *HML,* and *UMD*. We obtain factor returns from Kenneth French's data library. To control for investment objective, we further adjust returns and factor loadings of a fund by subtracting the annual median values within the fund's investment objective code. Each year from 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 average returns, alphas, and loadings for each quintile and report the time-series means for each quintile. We also report the differences between the top and bottom quintiles of religiosity ratios and associated t-statistics (in parentheses). ***, **, * indicate statistical significance at the two-tailed 1%, 5%, and 10% levels, respectively.

	Low	2	3	4	High	H-L	t-stat
Sorted on Protestant Ratio							
Fund 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)
Beta	-1.50%	0.22%	-0.52%	-1.40%	-2.18%	-0.68%	(-0.29)
SMB Loading	10.00%	2.85%	8.62%	8.09%	2.47%	-7.53%**	(-2.13)
HML Loading	1.47%	4.80%	-0.66%	1.89%	-3.11%	-4.58%*	(-1.97)
UMD Loading	1.35%	-1.55%	0.50%	-1.21%	1.36%	0.01%	(0.00)
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)
Beta	-1.90%	-1.20%	-0.09%	-0.07%	-1.15%	0.75%	(0.63)
SMB Loading	3.25%	8.16%	5.28%	6.60%	5.46%	2.21%*	(1.73)
HML Loading	-2.80%	-0.61%	5.18%	3.13%	-0.51%	2.29%	(1.22)
UMD Loading	0.06%	-0.28%	-1.28%	-0.08%	1.25%	1.19%	(1.22)
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)
Beta	-1.77%	-0.10%	-1.08%	-0.41%	-1.13%	0.64%	(0.43)
SMB Loading	9.65%	2.70%	4.10%	5.36%	8.27%	-1.39%	(-0.46)
HML Loading	-2.16%	2.76%	-0.16%	3.26%	0.22%	2.38%	(1.12)
UMD Loading	-0.83%	-1.32%	0.57%	0.71%	1.17%	2.00%	(1.43)

Table 7
Mutual fund tournament across religiosity ratios: 1999–2008

Panel A presents mutual fund tournament risk-taking behavior across Protestant ratios. Our sample period starts from 1999 to 2008 due to 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, we further divide funds into 2x2 groups based on whether mid-year return is below or above the median, whether SDR is above or below the median. For each (X, 12-X) row, mid-year return of a fund-year is the buy-and-hold return of the fund in the first X months of the year, and SDR (standard deviation ratio) 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 mid-year return and SDR are calculated using daily mutual fund returns, and we follow Chan 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 2x2 cell using observations over all years. We also report Chi-square statistic and p-value relative to an equal probability distribution. 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. Panel C form 2X2 cells with the same method as Panels A and B but report the time-series averages of annual frequencies. For brevity we only report the cells in low mid-year return groups for the top and bottom terciles of religiosity ratios. Panel C also reports time-series t-statistics for the differences in frequencies of low return/high SDR cells between the top and bottom religiosity terciles. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Frequency Distributions Across Protestant Ratios

	Low Return		High Return			
	Low SDR	High SDR	Low SDR	High SDR	χ^2	p-value
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
Medium Protestant Ratio						
(5, 7)	23.27	26.67	26.67	23.40	13.74***	0.003
(6, 6)	24.50	25.44	25.44	24.63	0.95	0.812
(7, 5)	22.94	26.99	26.99	23.07	19.59***	0.000
(8, 4)	24.24	25.70	25.70	24.37	2.40	0.493
(9, 3)	23.43	26.50	26.50	23.56	11.21**	0.011
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 Return		High Return			
	Low SDR	High SDR	Low SDR	High SDR	χ^2	p-value
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
Medium Catholic Ratio						
(5, 7)	23.62	26.34	26.34	23.70	7.73*	0.052
(6, 6)	24.66	25.30	25.30	24.74	0.38	0.943
(7, 5)	23.58	26.38	26.38	23.66	8.16**	0.043
(8, 4)	24.55	25.41	25.41	24.63	0.72	0.867
(9, 3)	23.66	26.30	26.30	23.73	7.31*	0.063
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

Panel C: Frequency Distributions Across Religiosity Ratios: By-Year Approach

	Low Religiosity Ratio		High Religiosity Ratio			
	Low Return		Low Return			
	Low SDR (1)	High SDR (2)	Low SDR (3)	High SDR (4)	(4) - (2)	t-stat
Sorted on Protestant Ratio						
(5, 7)	23.61	26.22	24.78	25.12	-1.10*	(-2.07)
(6, 6)	23.88	25.95	25.71	24.20	-1.76**	(-2.80)
(7, 5)	23.28	26.56	25.21	24.69	-1.87***	(-3.44)
(8, 4)	23.74	26.09	25.76	24.14	-1.96**	(-3.06)
(9, 3)	23.11	26.72	25.34	24.56	-2.16**	(-2.64)
Sorted on Catholic Ratio						
(5, 7)	24.66	25.21	23.55	26.36	1.15	(1.47)
(6, 6)	24.89	24.98	24.10	25.81	0.83	(1.11)
(7, 5)	24.39	25.48	23.10	26.82	1.34*	(1.94)
(8, 4)	25.35	24.52	23.56	26.36	1.83**	(2.56)
(9, 3)	24.78	25.09	23.39	26.52	1.43*	(2.08)

Table 8
Analysis of mutual fund holdings

This table presents volatilities of holdings-based returns and characteristics of fund holdings. Panel A reports for each quintile the average volatilities and idiosyncratic volatilities of *holdings-based returns*, where the monthly holding-based returns are the monthly buy-and-hold returns of mutual funds' reported stock holdings. *Total Volatility* of a fund is standard deviation of the fund's holdings-based monthly returns estimated at annual interval. *Idiosyncratic Volatility* 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 *Total Volatility* and *Idiosyncratic Volatility* of a fund by subtracting the annual median values within the fund's investment objective code. Each year from 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 volatility measures for each quintile, and report the time-series means for each quintile in Panel A. We also report the differences between the top and bottom quintiles of religiosity ratios and the associated t-statistics (in parentheses). In Panel B, we report the average return volatility and skewness of stocks held by mutual funds across religiosity ratios. For each stock, we estimate the idiosyncratic volatility and skewness using annual four-factor model regressions. 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. Panel C reports average industry concentration of mutual fund portfolios across 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, Sialm, and Zheng, 2005). ***, **, * indicate statistical significance at the two-tailed 1%, 5%, and 10% levels, respectively.

Panel A: Volatilities of Holdings-Based Returns

	Low	2	3	4	High	H-L	t-stat
Sorted on Protestant Ratio							
Total Volatility	0.36%	0.30%	0.34%	0.32%	0.22%	-0.13%***	(-2.58)
Idiosyncratic Volatility	0.24%	0.25%	0.15%	0.20%	0.11%	-0.12%***	(-6.68)
Sorted on Catholic Ratio							
Total Volatility	0.21%	0.50%	0.32%	0.22%	0.28%	0.07%*	(1.85)
Idiosyncratic Volatility	0.13%	0.24%	0.21%	0.11%	0.24%	0.11%***	(4.10)
Sorted on Total Religiosity Ratio							
Total Volatility	0.44%	0.29%	0.30%	0.25%	0.29%	-0.16%*	(-1.70)
Idiosyncratic Volatility	0.25%	0.18%	0.23%	0.18%	0.14%	-0.11%**	(-1.99)

Panel B: Average Idiosyncratic Volatility and Skewness of Stocks Held by Mutual Funds

	Low	2	3	4	High	H-L	t-stat
Sorted on Protestant Ratio							
Average Idiosyncratic Volatility	-0.12%	0.01%	0.14%	0.17%	-0.18%	-0.06%	(-0.87)
Average Idiosyncratic Skewness	0.00%	0.00%	0.01%	0.00%	-0.01%	-0.01%	(-1.47)
Sorted on Catholic Ratio							
Average Idiosyncratic Volatility	-0.19%	0.26%	0.06%	0.01%	-0.21%	-0.02%	(-0.16)
Average Idiosyncratic Skewness	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	(0.83)
Sorted on Total Religiosity Ratio							
Average Idiosyncratic Volatility	0.07%	-0.03%	0.07%	-0.06%	-0.03%	-0.10%	(-1.65)
Average Idiosyncratic Skewness	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	(1.23)

Panel C: 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)
Sorted on Total Religiosity Ratio							
Industry Herfindahl Index	0.11	0.15	0.14	0.11	0.09	-0.02***	(-3.09)
KSZ Concentration Index	0.24	0.28	0.27	0.24	0.22	-0.02***	(-4.09)

Table 9
Mutual fund turnover and religiosity ratios

Panel A reports average mutual fund 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 TNA of the fund. To control for investment objective, we further adjust turnover of a fund by subtracting the annual median value of all funds with the same investment objective code. Each year from 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 for each quintile in Panel A. We also report the differences between the top and bottom quintiles of religiosity ratios and associated t-statistics (in parentheses). Panel B reports panel regressions of turnovers where independent variables are religiosity ratios and fund characteristics. *Fund Age* is the number of years since the fund's first record in CRSP Mutual Fund data. *Fund Size* is total net assets (TNA) of a fund. # *Funds in Family* is the number of funds within the management company of the fund. We also include county-level demographic variables from the US Census Bureau and year×fund-objective fixed effects in each regression, but for brevity do not tabulate the estimates for these variables. The t-statistics (in parentheses) are calculated using standard errors clustered at the year×fund-objective level. ***, **, * indicate statistical significance at the two-tailed 1%, 5%, and 10% levels, respectively.

Panel A: Annual Turnover Ratio Sorted on Religiosity Ratios

	Protestant Ratio		Catholic Ratio		Total Religiosity Ratio	
Ratio quintile	Mean	Median	Mean	Median	Mean	Median
Low	1.09	1.15	0.75	0.69	0.92	0.89
2	1.00	1.03	0.92	0.93	0.94	0.91
3	0.95	0.86	1.01	0.98	0.83	0.78
4	0.86	0.89	0.94	0.88	0.93	0.91
High	0.79	0.77	1.20	0.95	1.04	0.98
High – Low	-0.30***		0.44		0.11	
	(3.51)		(1.56)		(1.19)	

Panel B: Parameter Estimates from Regressions of Annual Turnover Ratio

	Model 1	Model 2	Model 3
Protestant Ratio	-1.0474***		
	(-2.92)		
Catholic Ratio		1.3272***	
		(4.81)	
Total Religiosity Ratio			1.0814***
			(3.41)
Log (Fund Size, in $M)	-0.0965***	-0.0960***	-0.0971***
	(-5.37)	(-5.39)	(-5.42)
Log (Fund Age, in Years)	0.0252	0.0026	0.0141
	(0.41)	(0.04)	(0.24)
Log (# Funds in Family)	0.0459***	0.0372***	0.0499***
	(3.48)	(2.91)	(3.62)
Demographic Variables (Year*Fund Obj.) Fixed Effects	Yes	Yes	Yes
N(Year)	21	21	21
Obs.	6,760	6,760	6,760
R^2	0.047	0.051	0.047

Table 10
Return gap and religiosity ratios

Panel A reports average monthly return gaps across religiosity ratios. The sample period is from 1988–2006 due to the availability of data on return gap. Monthly return gap is defined as the difference between the reported monthly return and the monthly buy-and-hold return of the portfolio disclosed in the previous period. Each year 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 return gaps for each quintile, and report the time-series means for each quintile in Panel A. We also report the differences between the top and bottom quintiles of religiosity ratios and associated t-statistics (in parentheses). Panel B reports Panel regressions where the dependent variables are monthly return gaps. The independent variables include religiosity ratios and fund characteristics. *Fund Age* is the number of years since the fund's first appearance in the CRSP Mutual Fund database. *Fund Size* is total net assets (TNA) of the fund. # *Funds in Family* is the number of funds within the management company of the fund. We also include county-level demographic variables from the US Census Bureau and year×fund-objective fixed effects in each regression, but for brevity do not tabulate the estimates for these variables. The parameter estimates are reported in percentages. The t-statistics (in parentheses) are calculated using standard errors clustered at the month*fund-objective level. ***, **, * indicate statistical significance at the two-tailed 1%, 5%, and 10% levels, respectively.

Panel A: Monthly Return Gap Sorted on Religiosity Ratios

	Protestant Ratio		Catholic Ratio		Total Religiosity Ratio	
Ratio quintile	Mean	Median	Mean	Median	Mean	Median
Low	0.05%	0.03%	0.00%	-0.01%	0.04%	0.01%
2	0.03%	0.01%	0.05%	0.04%	0.02%	0.04%
3	0.02%	0.03%	0.04%	0.03%	0.01%	0.01%
4	0.04%	0.03%	0.03%	0.03%	0.03%	0.02%
High	-0.02%	-0.01%	0.01%	0.00%	0.02%	0.02%
High – Low	-0.06%***		0.01%		-0.02%	0.00%
	(-3.52)		(-1.49)		(-0.97)	

Panel B: Parameter Estimates from Regressions of Monthly Return Gap

	Model 1	Model 2	Model 3
Protestant Ratio	-0.1613**		
	(-2.26)		
Catholic Ratio		0.0712	
		(1.62)	
Total Religiosity Ratio			0.1040**
			(2.00)
Log (Fund Size, in $M)	-0.0008	-0.0008	-0.0009
	(-0.24)	(-0.26)	(-0.26)
Log (Fund Age, in Years)	-0.0254**	-0.0263**	-0.0264**
	(-1.99)	(-2.04)	(-2.06)
Log (# Funds in Family)	0.0007	0.0007	0.0008
	(0.21)	(0.20)	(0.24)
Demographic Variables	Yes	Yes	Yes
(Month*Fund Obj.) Fixed Effects	Yes	Yes	Yes
N(Months)	228	228	228
Obs.	106,902	106,902	106,902
R^2	0.011	0.011	0.011

Figure 1
Fund Flow-Performance Convexity across Local Religious Ratios

This figure depicts the fund flow-performance relationship across various local religious ratios. We first estimate quarterly fund flows using the following equation:

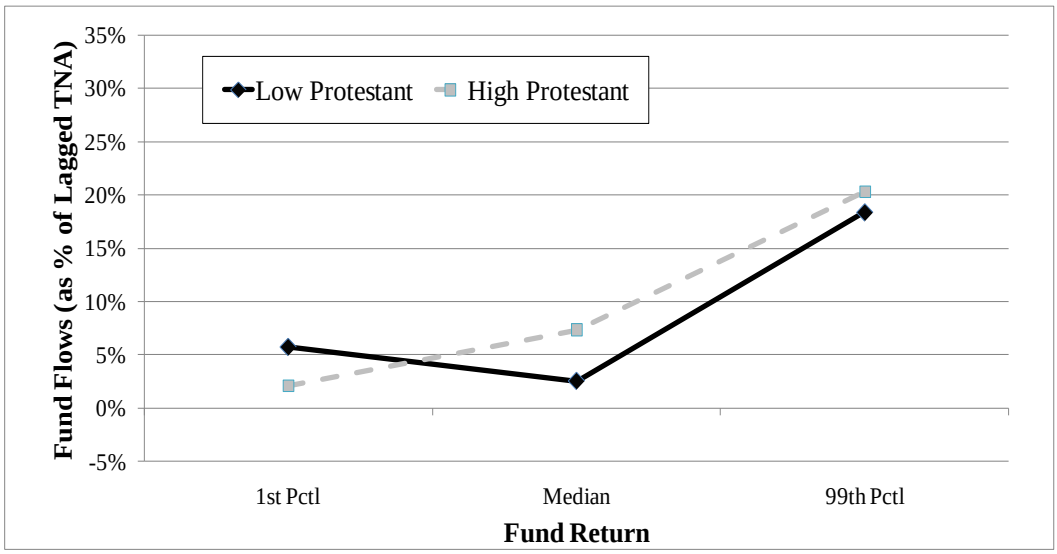
$$Flow_{iq} = \frac{TNA_{iq} - TNA_{iq-1} \times (1 + r_{iq})}{TNA_{iq-1}} - 1$$

where $Flow_{iq}$ is flow of fund i in quarter q. TNA_{iq} is total net assets of fund i in quarter q. r_{iq} is quarterly returns of fund i over quarter q. After estimating the flow, we run the following annual regression for funds located in regions in the top and bottom quintiles of *Protestant Ratio* (Panel A) and *Catholic Ratio* (Panel B):

$$Flow = a + b \times Return + c \times I(Above\text{-}Median) \times Return + d \times LagTNA + e \times I(Aggressive\ Growth) + \varepsilon$$

where *Return* is the annual fund return, and *I(Above-Median)* is a dummy variable that equals one if the annual fund return is above the annual median of fund return and zero otherwise. *LagTNA* is the fund's total net asset value at the end of prior quarter, and *I(Aggressive Growth)* equals one if the fund's investment objective is aggressive growth and zero otherwise. We then use the time-series averages of the intercept and the coefficients for *Return* and *I(Above-Median)×Return* to calculate fitted fund flows at one, 50, and 99 percentiles of fund returns. The lines in the figure represent the linear interpolation of estimated fund flows between the fitted values.

Panel A: Low versus High Protestant Ratio



Panel B: Low versus High Catholic Ratio

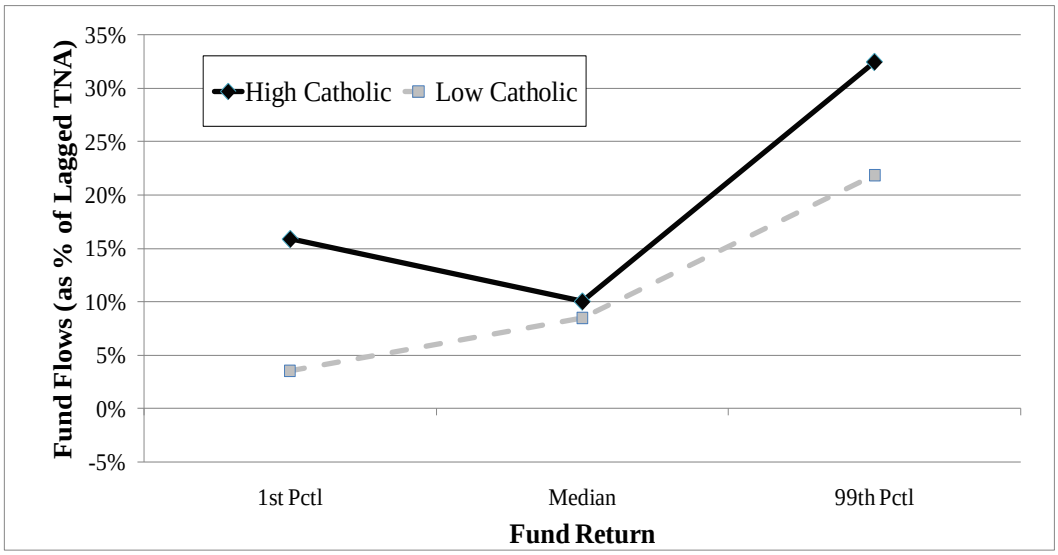
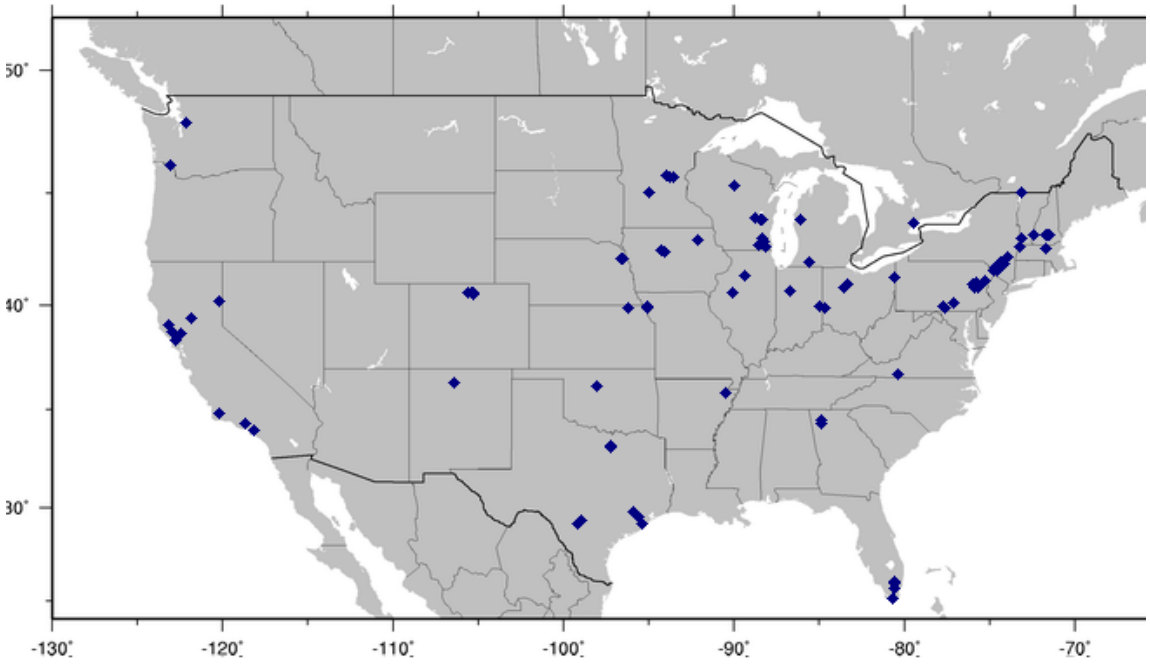


Figure 2
Geographic Distribution of Growth and Aggressive Growth Mutual Funds

This figure depicts the snapshot of geographical distribution of growth and aggressive growth U.S. mutual funds in 1988 (Panel A) and 2000 (Panel B).

Panel A: Geographic Distribution of Mutual Funds in 1988



Panel B: Geographic Distribution of Mutual Funds in 2000