

Do social factors influence investment behavior and performance? Evidence from mutual fund holdings

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Abstract

We study the economic significance of social dimensions in investment decisions by analyzing the holdings of U.S. equity mutual funds over the period 2004-2012. Using these holdings, we measure funds' exposures to socially sensitive stocks in order to answer two questions. What explains cross-sectional variation in mutual funds' exposure to controversial companies? Does exposure to controversial stocks drive fund returns? We find that exposures to socially sensitive stocks are weaker for funds that aim to attract socially conscious and institutional investor clientele, and they relate to local political and religious factors. The financial payoff associated with greater "sin" stock exposure is positive and statistically significant, but becomes non-significant with broader definitions of socially sensitive investments. Despite the positive relation between mutual fund return and sin stock exposure, the annualized risk-adjusted return spread between a portfolio of funds with highest sin stock exposure and its lowest-ranked counterpart is statistically not significant. The results suggest that fund managers do not tilt heavily towards controversial stocks because of social considerations and practical constraints.

Keywords: Mutual funds, Social norms, Sin stocks, Controversial stocks, Socially responsible investing

JEL classification: G11, G23, M14

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1. Introduction

A growing body of studies suggest that asset prices can be affected by a significant number of investors whose preferences for stocks are based on social considerations stemming from social norms or personal values. On the theoretical side, the prediction is that investors drive up the expected returns on stocks of companies they shun due to social considerations (Angel and Rivoli, 1997; Heinkel et al., 2001; Hong and Kacperczyk, 2009).¹ On the empirical side, researchers have proceeded along two fronts.

One area of research concentrates on the question whether certain individual and institutional investors indeed make investment decisions grounded in social norms and/or values, and how specific norms and values cause specific social considerations in investing. For example, Hong and Kacperczyk (2009) provide evidence that certain norms-sensitive institutional investors, such as public pension funds, shun stocks of companies that profit from the tobacco, alcohol, gambling, and weapons industries. Bollen (2007) reports that explicitly socially responsible mutual funds (SRI funds) experience a smaller money outflow after negative financial returns in comparison to conventional funds that report a negative return, consistent with fund clientele having social preferences.

A second body of research investigates directly the cross-section of either stock returns or mutual fund returns to test the hypothesis that social norms and values drive asset prices. Though various studies document higher risk-adjusted returns on hypothetical stock portfolios that are socially controversial (e.g., Fabozzi et al., 2008; Hong and Kacperczyk, 2009; Statman and Glushkov, 2009; Derwall et al., 2011; Salaber, 2013), an even larger literature shows that so-called socially responsible (SRI) mutual funds that explicitly screen out socially sensitive stocks do not

¹ Other related theoretical studies include Angel and Rivoli (1997), Fama and French (2007), and Gollier and Pouget (2014).

underperform regular funds (e.g., Bauer et al., 2005; Derwall et al., 2011; Leite and Cortez, 2014). On the one hand, these mixed results could imply that social considerations by most professional investors, if any, are not material enough to influence investment choices and investment performance (Heinkel et al., 2001). On the other hand, these findings may indicate that not only SRI funds but also a sizable number of conventional funds avoid socially sensitive stocks, which is why a return premium associated with these stocks would exist in the first place.

In this paper, we aim to clarify the economic significance of social dimensions in investment decisions by studying the actual holdings of U.S. equity mutual funds over the period January 2004 to December 2012. For the entire universe of mainly domestic U.S. equity funds, we measure each fund's portfolio weights in oft-cited socially sensitive equities such as stocks from tobacco alcohol and gambling (Hong and Kacperczyk, 2009), weapons manufacturers and nuclear operations (Statman and Glushkov, 2009; Derwall et al., 2011). Two closely related questions are central to this paper.

First, how prevalent are social considerations in investing among mutual funds, and what explains cross-sectional variation in mutual funds' exposure to controversial companies? Studies on institutional and individual investors suggest that specific segments of investors are responsive to social issues in investing due to societal norms (e.g., Hong and Kacperczyk, 2009), and due to their local political and religious environment (e.g., Hood et al., 2014). We investigate whether these factors in a similar way explain weights in socially sensitive stocks across mutual funds. Second, do social dimensions in mutual fund holdings drive fund returns? By studying funds' holdings, we intend to estimate the payoff that mutual funds in reality enjoy for every fraction of their assets invested in socially sensitive stocks, and how material their weights in these stocks are in order to generate return.

Our findings indicate that various mutual funds other than SRI funds display little or no exposure to socially sensitive stocks. We also find that these portfolio weights are different for funds that aim to attract specific investor segments, and they depend on local political and religious factors. While SRI funds represent one fund segment that underweights socially sensitive stocks relative to the average

fund, we also find some moderate evidence that mutual funds hold these stocks in smaller proportions as they manage a larger fraction of institutional share classes. In addition, funds located in states with a strong political preference for the Democratic Party hold smaller fractions of sin stocks in their portfolio. In contrast, funds located in states with greater levels of religiosity appear to have larger portfolio weights in socially sensitive stocks.

As for our second question, mutual fund holdings reveal a positive and statistically significant relation between the weight in sin stocks and a fund's risk-adjusted return. The relation becomes non-significant as we consider broader definitions of a socially sensitive stock by including companies that are more distantly associated with controversial businesses. However, despite the statistically significant relation between funds' return and their exposure to a specific set of sensitive stocks, the annualized risk-adjusted return spread between a portfolio of funds with highest sin scores and its lowest-ranked counterpart is statistically not significant. The results suggest that fund managers do not tilt towards controversial stocks, either because of practical constraints or due to social norms.

Although the majority of studies have focused on investors abstaining from sin stocks due to norms and values, the literature on socially responsible investing documents alternative ways for investors to translate social considerations in investment choices, such as the consideration of so-called "Environmental, Social and Governance" (ESG) indicators. In additional tests, portfolio weights in sin stocks are replaced by weights in weak-ESG and strong-ESG companies. Regressions involving these alternative weights further corroborate that exposure to socially sensitive (progressive) stocks relates to fund- and location-specific factors, but they do not reveal a significant payoff associated with ESG profiles in our sample of mutual funds.

The results contribute to the literature along several lines. First, the paper contributes to the literature on social norms in markets. So far, most studies have shown that norms and values affect aversion to controversial stocks among specific institutional investors (Hong and Kacperczyk, 2009) or individual investors (Hood et al., 2014), with implications for asset pricing. This study explores how mutual funds' aversion to socially sensitive investments relates to fund characteristics as well as local political and religious factors. The results of the study also extend Hong and Kostovetsky (2012), who

show that fund managers who make greater contributions to the Democratic (Republican) Party avoid more (less) politically sensitive stocks.

Second, our conclusion that sin stock exposure in mutual funds has a limited impact on performance contributes to literature on the cost of socially conscious investing. So far this literature has revolved around a comparison between either hypothetical sin stock portfolios and non-sin portfolios or SRI funds and conventional funds. Unlike studies that document higher return on hypothetical controversial stock portfolios, mutual fund holdings can clarify the exposure and return associated with sin stock investment in practice.² Furthermore, our observation that conventional funds may avoid controversial stocks just like SRI funds implies that a crude comparison between SRI and non-SRI funds masks the true effect of social screens on investment return.³ Overall, the results make a case for studying the effects of social investment considerations on fund performance based on the holdings of mutual funds.

The next section of this paper outlines a discussion of theory and prior evidence, which leads to the formulation of testable predictions. Section 3 describes the data we use to identify socially sensitive stocks in the holdings of U.S. mutual funds, and financial data on the stocks, mutual funds, and benchmark portfolios that are central to this study. Section 4 outlines the measurement of mutual funds' exposure to socially sensitive stocks, and reports on our main empirical results. Section 5 presents additional tests, including alternative ways of scoring funds on socially sensitive and progressive investments. Section 6 concludes this study.

2. Theoretical background and prior research

2.1. Norms and values as determinants of social dimensions in mutual fund holdings

² Apart from revealing differences in exposure to socially sensitive stocks across funds, another advantage of studying mutual fund holdings is that funds have traded stocks based on real prices and their returns are generated in the presence of real-time transaction costs and trading restrictions (e.g, liquidity).

³ These results also contribute to mixed evidence about the distinctive nature of SRI funds relative to conventional funds as revealed by their holdings; see, e.g., Kempf and Osthoff (2008) and Utz and Wimmer (2014).

There is now a developing consensus that specific individual and institutional investors shun socially sensitive stocks, to conform to social norms or to align investments with personal values and beliefs (e.g., Hong and Kacperczyk, 2009). To what extent do social considerations along similar lines affect mutual funds' avoidance of social sensitive stocks? If it is true that investors are attentive to the socially sensitive nature of investments, then mutual funds may have an incentive to provide investment portfolios that cater to clientele by considering social criteria. We therefore expect that several mutual funds are more averse to socially sensitive stocks depending on the nature of their clientele and on dominant local norms and values.

Among the universe of mutual funds is one segment that explicitly intends to attract clients on the basis of social considerations. So-called "socially responsible investment" (SRI) funds explicitly state the use of social screens to attract a specific set of clientele that wish to see their values reflected in socially conscious investments. Bollen (2007) provides evidence that SRI funds attract specific clientele. He finds that SRI funds experience a weaker cash outflow after producing a negative return than do other funds, consistent with the idea that SRI fund clientele are more loyal to their fund because they enjoy non-pecuniary benefits from its social feature. Renneboog et al. (2011) also show that flows out of SRI funds are less sensitive to past negative returns than are conventional fund flows, and especially so when SRI funds use screens on issues such as tobacco, alcohol, gaming, weapons, and adult entertainment.

Another class of funds, which is closely connected to SRI funds, explicitly offers investments that are tailored to religious clientele. Statman (2005) explains that the concept of socially responsible investing has roots in religion, and discusses mutual funds that are premised on a specific religion. Peifer (2011) shows that alignment of investments with religious principles is not confined to SRI funds, thereby indicating that religious funds can be seen as a separate segment of the mutual fund universe that may avoid controversial business exposure. Examples of faith-based investments include Catholic investments (Kurtz and DiBartolomeo, 2005), Christian funds, and Islamic investments (Hoepner et al., 2011; Walkshäusl and Lobe, 2012). Since various religions investments reveal opposition to socially

and morally objectionable business practices, the holdings of explicitly religious funds are expected to display a significantly weaker exposure to socially sensitive investments.

In addition to SRI and religious funds, it is possible that non-SRI and non-religious funds perform social screens on their investment universe due to clientele effects. For example, according to Hong and Kacperczyk (2009), certain institutional investors such as public pension funds are sensitive to public opinion and consequently display investment preferences that appear to conform to social norms. They suggest that social norms lead to such investors avoiding stocks of firms that earn from tobacco, alcohol and gaming (which they refer to as “sin stocks”). If it is true that social norms cause various institutional investors to shun socially sensitive stocks, the question arises whether there are similar investment implications for mutual funds that make investment decisions on behalf of institutional clientele.⁴ Extending the logic of Hong and Kacperczyk (2009) to the setting of mutual funds, one could expect that funds in which institutional clientele can participate through specific share classes are more inclined to cater to institutions by avoiding socially sensitive stocks.⁵

We expect another range of funds to be responsive to social controversies in investing because fund managers’ investments are influenced by local values, beliefs, and norms. Fund managers may make investments in conformity with local social values simply because their own preferences are influenced by people in their area with whom they interact (see, e.g., Shu et al, 2012; Hong et al., 2004). Alternatively, fund managers might choose to integrate local social values in investing in order to cater to local clientele because research has indicated that people select investment opportunities that are geographically close to their homes.⁶ Based on earlier literature on the relation between values, norms, and social responsibility, we would expect that at least two local factors matter in explaining mutual funds’ stance to socially sensitive investments: local political values, and religion.

⁴ We thank an anonymous referee for suggesting this possibility.

⁵ If funds’ social considerations cater to institutional clients at the expense of weaker investment performance then non-institutional clientele who do not share the social investment preferences of their institutional counterparts would suffer a cost. However, this potential conflict of interest is potentially less severe when institutional shares classes represent a greater fraction of assets under management.

⁶ See Ivkovic and Weisbenner (2005) for local investment bias among households.

The link between political values and social dimensions in decision making has been shown at both the investor level and corporate level. In a study related to ours, Hong and Kostovetsky (2012) show that mutual fund managers that donate more to democrats are less invested in politically sensitive stocks. At the level of individual investors, Hood et al. (2014) connect households' preferences for socially responsible stocks to the dominant political views in their county. At the corporate level, it has been shown that firms with lower scores on corporate social responsibility - the corporate equivalent of socially conscious investing - tend to be run by CEOs that contribute more to the Republican party (see Di Giuli and Kostovetsky 2014), and tend to be located in areas with more support for the Republican Party (see, e.g., Rubin, 2008; Van Soest et al., 2012).⁷ Studies that connect corporate social responsibility to firm location build on the notion that managers' views on the role of corporations in society are influenced by those of local stakeholders. A natural follow-up question to ask is whether mutual fund managers are just as responsive as corporate managers to local stakeholders' preferences for social responsibility, as inferred from their political affiliation. Concerning the U.S. political landscape, the conventional wisdom is that people who favor the views of the Democratic party tend to oppose more strongly than Republicans socially controversial businesses (e.g., Rubin, 2008; van Soest et al, 2012; Hong and Kostovetsky, 2012; Di Giuli and Kostovetsky 2014; Hood et al., 2014). Hence, it can be anticipated that mutual funds located in areas that strongly favor the Democratic Party are more inclined to translate local political views into avoidance of socially controversial investments.

Next to the local political landscape, religiosity represents the second local factor that can be expected to drive social dimensions in mutual funds holdings. While the link between religious beliefs and investing can be seen most clearly from explicitly religious mutual funds mentioned earlier, local religious beliefs may shape the investment choices of mutual funds that do not have an explicit religious affiliation. Prior studies found that local religiosity affects the risk-taking behavior of mutual fund managers' (Shu et al., 2012) and that of corporate managers (Hillary and Hui, 2011). Given the historic link between religion and social investing, it can be expected that mutual funds' exposure to socially

⁷ In addition, Kumar et al. (forthcoming) find that firms with a Republican culture are more likely to be confronted with environment-, labor- and civil rights-related lawsuits than Democratic firms.

controversial assets depends on the extent to which they operate in a strongly religious environment. Although people with different religious backgrounds may have different attitudes towards specific social issues, their actual investment choices might have more in common (Ghoul and Karam, 2005). Exclusionary criteria such as tobacco, alcohol, and gambling appear on the agenda of Catholic investors (see Dibartolomeo and Kurtz, 2005), but also weigh into investment decision of many Islamic and Christian investors (Ghoul and Karam, 2005). Assuming that most dominant religions have a set of social considerations in common, we expect that the degree of local religiosity affects fund managers' aversion to socially sensitive investments.

Taken together, the findings above lead to several testable predictions regarding the determinants of mutual funds' socially sensitive investments. The first prediction is that explicit SRI funds are differently exposed to controversial investments. Second, we expect that explicitly religious funds are in different proportions invested in socially controversial investments. Third, funds are expected to avoid socially controversial investments more as a greater fraction of their assets under management stems from share classes that target institutional clientele. Fourth, funds located in areas that strongly favor the Democratic Party exhibit a different exposure to socially sensitive investments than do funds located in strongly Republican areas. Fifth, funds located in strongly religious areas are expected to invest in different proportions in socially sensitive investments compared to funds from areas with weaker local religiosity.

If these predictions hold, they provide support for the argument that various mutual funds beyond just the subset of SRI and religious funds translate norms and values into avoidance of socially controversial investments. These effects may also have implications for asset pricing. Recent theories illustrate how norms and values influence asset prices and investment returns precisely when such investors come in larger numbers than implied by the market for explicit SRI alone. We turn to these theories in the next section and discuss their relevance for mutual funds.

2.2. Implications of norms and values for the cross-section of mutual fund returns

The idea that a significant number of mutual funds and other types of investors avoid socially sensitive assets has potential implications for the cross-section of stock and mutual fund returns. Angel and Rivoli (1997), Heinkel et al. (2000), and Hong and Kacperczyk (2009) all provide the theoretical prediction that socially sensitive stocks have a higher expected return than less sensitive stocks beyond what is implied by differences in exposure to typical common risk factors. As the argument goes, investor boycotts of the stocks of socially sensitive companies expose shareholders of socially sensitive companies to additional risks they would not face in the absence of boycotts, such as limited risk sharing due to a smaller shareholder base and exposure to idiosyncratic risk that cannot be diversified away. Consequently, it is predicted that stocks of these companies trade at lower prices and have higher expected returns, *ceteris paribus*.

Studies that have tested hypothetical investment strategies provide evidence that controversial stocks indeed outperform other stocks controlling for common risk factors such as beta, size, value, and momentum effects; see, for example Fabozzi et al. (2008), Hong and Kacperczyk (2009), Statman and Glushkov (2009), Derwall et al. (2011). According to Hong and Kacperczyk (2009), the annualized average risk-adjusted return of a portfolio long in sin stocks (tobacco, alcohol, and gaming stocks identified using SIC and NAICS codes) and short in comparable stocks is in the range of 0.26% to 0.33% per month. Statman and Glushkov (2009) and Derwall et al. (2011) identify a broader set of sin stocks using socially controversial business indicators from a research firm KLD. They document a positive risk-adjusted return on a value-weighted portfolio composed of “shunned” stocks – stocks that are associated with tobacco, alcohol, gaming, military and firearms, and nuclear operations. Beyond the U.S. equity market, Salaber (2013) hypothesizes that the Protestant religion in Europe is associated with greater aversion to sin stocks compared to the Catholic religion, with implications for European stock returns. She finds that stocks of European “sin” firms that are domiciled in mainly Protestant countries outperform sin stocks of firms from Catholic countries. Her findings lend support to the notion that aversion to socially sensitive assets is partially rooted in religion.

Although the return premium associated with socially sensitive stocks appears to be economically and statistically significant in most portfolio studies, it remains an open question whether

social dimensions in investing materially influence the returns of real traded portfolios, such as those managed by mutual funds. An abundance of studies finds that risk-adjusted returns of conventional mutual funds are no different from those of SRI funds, which explicitly state a policy to screen out socially sensitive stocks from their investment universe (for a review, see Derwall et al., 2011). Bauer et al. (2005) and Renneboog et al. (2008) report that SRI funds have not underperformed their conventional peers in terms of Carhart's (1997) four-factor alpha in most countries they investigated.

We can think of at least three possible reasons for why SRI funds that screen out socially sensitive stocks do not experience a performance loss even though hypothetical controversial stock portfolios appear to produce positive abnormal returns. First, the effects of social norms on stock prices might have no meaningful investment implications once trading costs, portfolio managers' benchmark constraints, and illiquidity are accounted for. Previous studies that use mutual funds have shown that common stock anomalies such as size, value, momentum, and accruals effects in stock returns are also different on paper than in reality (e.g., Ali et al. 2008; Huij and Verbeek 2009). Second, socially sensitive stocks might have a higher expected return precisely because not only SRI funds but also conventional funds limit their exposure to controversial businesses. Hong and Kostovetsky (2012) suggest that various conventional funds may engage in a form of closet-SRI, e.g., by shunning socially sensitive stocks without an explicit SRI policy. Third, mutual funds may not experience higher returns from tilts to controversial stocks if they maintain a definition of controversial stocks that differs from the consensus. Heinkel et al. (2000) estimate that a stock of a polluting company has a higher expected return when it is shunned by 10% to 20% of the financial market, but question whether environmentally controversial stocks are prone to exclusion by such a significant fraction of investors. The U.S. social investment forum (USSIF, 2005) reports that the four most common exclusionary screens employed by SRI funds revolved around tobacco, alcohol, gambling, and weapons. Hong and Kacperczyk (2009) hypothesize that tobacco, alcohol, and gaming in the U.S. are more likely to be deemed objectionable among norms-constrained

institutional investors than weapons manufacturers because social norms are more lenient toward guns. In more recent years, though, investors have displayed increased attention to investing subject to so-called environmental, social and governance (ESG) issues, which stretch beyond classic sin sectors (see, e.g., Borgers et al., 2013).

Based on the reasoning above, we predict that mutual fund returns are related to socially sensitive investments, but only to the extent that these investments are deemed sufficiently controversial by the majority of investors. By considering more narrow as well as broader definitions of socially sensitive stocks, we expect to better understand how well norms and values explain funds' portfolio weights in companies that have core operations in controversial industries versus those that are more distantly regarded as controversial.

3. Data

3.1. Data on socially sensitive stocks

For the identification of securities that are deemed socially sensitive, we consider different definitions proposed in the literature. According to Hong and Kacperczyk (2009), especially sin stocks are shunned by investors because of societal norms against funding “vice.” Following Hong and Kacperczyk (2009), we use the CRSP stocks database to identify a group of sin stocks (SIN_HK) based on SIC and NAICS codes, pertaining to companies that have core operations in the tobacco, alcohol, and gambling industries.

Next, we rely on corporate social responsibility indicators from Morgan Stanley Capital Indexes (MSCI) to arrive at alternative sets of socially sensitive stocks. The MSCI STATS database has since 2003 provided, on an annual basis, more than 50 indicators from 7 broader

“Environmental, Social, and Governance” (ESG) categories covered for all constituents of the Russell 3000 universe. Among the indicators that STATS covers are controversial business indicators that span a firm’s involvement in tobacco, alcohol, gambling, firearms, military, and nuclear power, as well as “concerns” and “strengths” indicators in ESG areas beyond the aforementioned controversial businesses (e.g., employee relations, environment, community relations, and diversity). Because the indicators from STATS flag firms on tobacco, alcohol, and gambling even when they are merely loosely connected to these businesses, we determine a second class of sin stocks based on the looser STATS definition (SIN_STATS). We also consider a third class of sin stocks, which are derived from using both the Hong and Kacperczyk (2009) and STATS identification approaches (SIN_All).

Our most broad definition of sin stocks (BROADSIN) includes those that STATS associates with tobacco, alcohol, gambling, weapons, firearms and nuclear operations (see, e.g., Statman and Glushkov, 2009; Derwall et al., 2011).

3.2. Mutual fund holdings, returns, characteristics, and location

Using the CRSP Mutual Funds Database, we gather information about the holdings, monthly returns, and characteristics - such as expenses, assets under management, and share classes - of mainly domestic U.S. equity mutual funds from January 2004 up to December 2012. We exclude funds that had less than 75% of their assets invested in U.S. equities, index funds, specialty funds, global funds, micro-cap funds, and ETFs.⁸ In order to identify which of the securities held by U.S. mutual funds are socially controversial, we match all their equity holdings with the CRSP stocks database and the MSCI STATS ESG database (see Section 3.1). Each fund must have at least 25

⁸ We keep funds with the following investment objectives (retained from Lipper data as well as Fund names): Capital Appreciation, Growth, Growth Income, Income, Mid Cap, Small Cap.

stocks and 75 percent of its equities successfully matched with STATS to remain in our final sample. Finally, we estimate each fund's risk-adjusted return using the Carhart (1997) four-factor model and drop a fund if the four-factor model explains less than 50% of its return variation (suggesting the fund is not a pure domestic-equity fund). The factor data are from the Kenneth French Data Library.⁹ The selection procedure results in a sample of 6443 mutual fund-year observations that we use to study funds' socially sensitive investments from January 2004 to December 2012. Our final sample covers over 89% of the total market capitalization of all equities covered in the STATS database.

Included in the sample of mutual funds in the U.S. are certain SRI funds, which explicitly state the use of social screens in investment decisions. In order to determine which of the mutual funds in our sample involve explicit SRI funds, we use Morningstar Premium, the U.S. Social Investment Forum, SocialFunds.com, and previous studies on SRI mutual funds. To determine the accuracy of these sources, we hand-collected information about the social responsibility screens that the funds claim to apply in their investments, using the funds' websites, prospectuses, and occasionally email correspondence with fund managers. A fund is confirmed to be explicitly socially responsible (SRI = 1) if the fund indicates that it applies to its investment opportunity set at least one of the screens that we consider.¹⁰ The number of U.S. SRI equity funds in our sample with confirmed investment screens increases over time, from 52 in 2004 to 72 in 2012. In a similar way, we identify mutual funds with an explicitly religious affiliation based on public sources such as the U.S. social investment forum, prior studies, and searches for religious terms in fund names.

⁹ http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html#HistBenchmarks, these factors are based on Fama French (1993) extended with the momentum factor from Carhart (1997).

¹⁰ We verify the responsible investment screens applied by the funds in this set to the presence of screens concerning alcohol, gambling, tobacco, weapons, and nuclear operations. In addition to these screens we evaluate the presence environmental, social, and governance screens, and other "social" screens (community, diversity, employee, environment, human rights, and governance).

For explorations into funds' local political and religious climate, we use Lipper information from Factset SPAR on the location by state of funds' management company.¹¹ As with firm location data, financial databases provide only current location data for mutual funds and we thus implicitly assume that funds remained located in the same state throughout our study period.

3.3. State-level data on political preferences, religiosity and controversial business

We match mutual fund location data with presidential election results and religious adherence by state in order to determine funds' local political and religious environment. Based on the 2000 – 2012 U.S. Presidential election data from the U.S. Electoral College (www.archives.gov), we define annually the top 20% of states in terms of votes cast for the Democrat (Republican) party during presidential elections as strongly Democrat-leaning (Republican-leaning). Hypothetical votes during non-election years are derived through linear interpolation. In a similar way, local religious environment is derived from 2000 and 2010 survey data on the fraction of religious adherents by state, which is provided by the American Religion Data Archive (ARDA). “Religious” states are in the top 20% of states in terms of religious adherence. We also collect additional information on the extent to which funds operate in states where sin businesses are more prevalent. “Alcohol states” are defined as states with per capita alcohol consumption in the top 20% of the U.S. based on data from the National Institute on Alcohol Abuse and Alcoholism (NIAA). Following Hood et al. (2014) we determine that “Tobacco states” comprise the six major tobacco-producing states (GA, KY, NC, SC, TN, and VA) according to the National Agricultural Statistics Service, 1997. United States Department of Agriculture, US Printing Office, Washington DC. Finally, in each year we classify “Gambling states” to be those states with commercial casino operations according to the American Gambling Association (www.americangaming.org).

4. Empirical analysis

¹¹ Data were collected at the end of 2014.

4.1. Measuring mutual funds' controversial investments

In our main analyses, for every mutual fund-year observation in our sample, we determine holdings-based scores that measure in four alternative ways the extent of socially sensitive common stock investment. As described in Section 3.1, we first measure funds' exposure to sin stocks based on the sin stock definition of Hong and Kacperczyk (2009). We subsequently consider controversial business indicators from MSCI STATS to score funds based on looser definitions of sin stocks as well as broader interpretations of a socially sensitive investment.

To derive the four scores for mutual fund i , we use the fund's holdings and value weight the firm level j . We first determine the following mutual fund scores without any adjustment for sin stock exposures that are inherent in specific investment styles:

$$Unadj.FundSIN_HK_{i,yr} = \sum_{j=1}^J weight_{j,yr} * Dfirm_sin_HK_{j,yr-1} \quad (1a)$$

$$Unadj.FundSIN_STATS_{i,yr} = \sum_{j=1}^J weight_{j,yr} * Dfirm_sin_STATS_{j,yr-1} \quad (1b)$$

$$Unadj.FundSIN_All_{i,yr} = \sum_{j=1}^J weight_{j,yr} * Dfirm_sin_All_{j,yr-1} \quad (1c)$$

$$Unadj.FundBROADSIN_{i,yr} = \sum_{j=1}^J weight_{j,yr} * Dfirm_broadsin_{j,yr-1} \quad (1d)$$

where $Dfirm_sin_HK$ is 1 if stock j classifies as a sin stock according to the definition of Hong and Kacperczyk (2009) based on SIC codes, and zero otherwise, $Dfirm_sin_STATS$ is 1 if the stock j held by the fund is associated with tobacco, alcohol, or gambling sectors according to STATS and zero otherwise, $Dfirm_broadsin$ is a dummy variable that equals 1 if stock j is associated with tobacco, alcohol, gambling, firearms and military, or nuclear operations according to STATS, and $Dfirm_sin_All$ takes the value of 1 if either $Dfirm_sin_STATS$ or $Dfirm_sin_HK$ equals 1. Because quarterly holdings data is not complete for all funds – that is, funds tend to report only

(semi-)annually, especially in the earlier years of our sample - we use the yearly average of all quarterly available fund scores for each mutual fund.

Since exposures to socially sensitive assets have been shown to be inherent in several classic investment styles such as those based on “value” and “size”, style-adjusted mutual fund scores are central to our main analyses. We determine for each fund in our sample the fund’s sensitivity to the four factors from Carhart (1997). The factor loadings for each fund are estimated by means of the following four-factor regression:

$$R_{i,t} - R_f = \alpha_i + \beta_{0,i}(R_{m,t} - R_{f,t+1}) + \beta_{1,i}SMB_t + \beta_{2,i}HML_t + \beta_{3,i}MOM_t + \varepsilon_{i,t} \quad (2)$$

where $R_{i,t}$ represents each mutual funds’ monthly return, $R_{m,t} - R_f$ is the return on a value-weighted portfolio composed of all stocks from the NYSE/AMEX/Nasdaq exchanges, in excess of a risk-free rate of return from Ibbotson. SMB_t is the return difference between a small cap portfolio and a large cap portfolio, and HML_t is the return difference between a “value” portfolio (with a high book/market value ratio) and a growth (low book/market value) portfolio; MOM_t is the return difference between a portfolio of past 12-month winners and a portfolio of past 12-month losers¹².

We then allocate each fund to a style class based on 3x3 grid of investment styles, determined using the distribution of funds’ loadings on the size (SMB) and value (HML) factors and the 33.3rd and 66.6th percentiles as cut-off levels. To estimate the factor loadings we use returns over the past 2 years and require that for each fund month we have at least 20 monthly returns. Our main analysis will rely on the following style-adjusted fund scores:

¹² Fama and French (1993) and Carhart (1997) provide more details on the construction of the factors and the performance evaluation model.

$$FundSIN_HK_{i,yr} = Unadj.FundSIN_HK_{i,yr} - StyleSIN_HK_{i,yr} \quad (3a)$$

$$FundSIN_STATS_{i,yr} = Unadj.FundSIN_STATS_{i,yr} - StyleSIN_STATS_{i,yr} \quad (3b)$$

$$FundSIN_All_{i,yr} = Unadj.FundSIN_All_{i,yr} - StyleSIN_All_{i,yr} \quad (3c)$$

$$FundBROADSIN_{i,yr} = Unadj.FundBROADSIN_{i,yr} - StyleBROADSIN_{i,yr} \quad (3d)$$

where $StyleSIN_HK_{i,yr}$ is the average of $Unadj.FundSIN_HK_{i,yr}$ scores associated with funds that belong in the same style group as fund i .

Descriptive statistics on the mutual fund score-year observations from 2004 up to 2012 are presented in Table 1, along with other characteristics of the mutual funds in our sample. The average fund is 178 months old, has \$1.6 billion of assets under management, and charges 1% of expenses excluding 12b1 fees. About 52% of all fund-year observations correspond to funds that have at least one class charging load fees.

Moreover, Table 1 shows that the average fund has 2.4% of its assets under management invested in sin stocks (tobacco, alcohol, gambling) as derived from SIC and NAICS codes (mean $Unadj.FundSIN_HK = 0.024$). The average sin stock exposure increases to 4.1% if we define sin firms as those associated with tobacco, alcohol and gambling according the MSCI STATS database (mean $Unadj.FundSIN_STATS = 0.041$), and to 4.4% if we if a firm is connected to sin businesses by either of these two approaches (mean $Unadj.FundSIN_All = 0.044$). The average fund's exposure to controversial stocks increases considerably to 13.4% if we consider sin stocks from STATS augmented with those connected to firearms, military, and nuclear operations (mean $Unadj.FundBROADSIN = 0.134$). Furthermore, 2.7% of all fund-year observations pertain to explicitly SRI-labeled funds, and 2.1% represent religious funds.

In an analysis that is not tabulated, we also calculated sin stock exposures for a market capitalization-weighted stock portfolio that contains the firms covered in the STATS database (which spans the Russell 3000 index). On average, 3.9% of this portfolio's market capitalization comprised sin stocks over the period 2004-2012, when this estimate is based on the sin-stock definition of Hong and Kacperczyk (2009). Furthermore, 6.4% of the portfolio's market value represented sin stocks in the STATS database, and 17.8% were associated with all controversies that we consider in our broadest category of sin stocks. Hence, the mean exposures of the funds in our sample are somewhat below that of a representative market-wide portfolio.

The histograms A to D of annual mutual fund scores reported in Figure 1 indicate that U.S. mutual funds are to a varying degree invested in controversial stocks, with a few funds having more than 50 percent of their total assets under management invested in controversial firms. For example, among those that score high on the four mutual fund scores are the Vice Fund, Fidelity's Defense & Aerospace Portfolio, and several Industrial funds. On the other hand, a significant number of mutual funds had no capital invested in companies that STATS associates with Tobacco, Alcohol, Gambling, Weapons and Military, and Nuclear operations-related businesses.

Figure 2 shows that the four mutual fund scores display a more normal distribution once exposures to socially sensitive stocks are adjusted for investment style. The style-adjusted exposure are central to the main analyses in the paper.

Table 2 provides a first impression on the extent to which mutual funds other than explicit SRI funds avoid socially sensitive stocks in comparison to explicit SRI funds. In Table 2, we allocate non-SRI funds to quartile portfolios using one of the four measures of exposure to socially sensitive stocks. Subsequently we compute for each quartile the difference between the average style-adjusted exposure of all explicit SRI funds in our sample and the quartile. It appears that explicit SRI funds on average score significantly *higher* on *FundSIN_HK*, *FundSIN_STATS*, and *FundBROADSIN* than does the bottom quartile conventional funds, and significantly higher on *FundSIN_All* than the bottom two

quartiles conventional funds. The spread $FundSIN_HK$ between the average SRI fund and the bottom quartile is about half a standard deviation.

Hence, although SRI funds might have a smaller weight in socially sensitive stocks on average in comparison to conventional funds, these descriptive statistics provide a first indication that various conventional mutual funds exhibit zero or very little exposure to socially sensitive stocks. In the next section, we more formally explore what drives differences in funds' exposure to socially sensitive stocks.

4.2. The determinants of mutual fund exposure to socially sensitive investments

To test our hypotheses on the determinants of mutual funds exposures to socially sensitive stocks, we perform two sets of OLS regressions. We first examine the relative exposures of SRI funds, religious funds and funds with institutional shares classes, using OLS regressions of the form:

$$FundSCORE_{i,yr} = c + \gamma_1 SRI_{i,yr-1} + \gamma_2 Religious_{i,yr-1} + \gamma_3 Institutional_{i,yr-1} + \sum_{k=4}^K \gamma_k Controls_{i,k,yr-1} + \varepsilon_{i,y} \quad (4)$$

where $FundSCORE$ refers to one of the alternative style-adjusted measures of a fund's exposure to socially sensitive stocks. We start with modelling exposure to sin stocks based on the narrowest definition of sin stocks ($FundSIN_HK$), which is based on Hong and Kacperczyk (2009), and then consider broader definitions of sin stocks $FundSIN_STATS$, $FundSIN_All$, and $FundBROADSIN$. $SRI_{i,yr-1}$ indicates whether fund i explicitly claimed to have at least one social investment screen, $Religious_{i,yr-1}$ equals 1 if the fund is an explicitly religiously affiliated fund, $Institutional_{i,yr-1}$ represents the fraction of assets under management from institutional investor shares classes. Included in the vector $Controls_{i,k,yr-1}$ are fund specific, time-specific and style variables that have mentioned as potential drivers of social dimensions in investors' portfolios (e.g., Bauer et al., 2005; Hong and Kostovetsky, 2012; Hood et al., 2014): the natural logarithm of fund age (the age of the oldest share class of the mutual fund measured in months since the inception date), fund size (the natural logarithm

of total net assets (TNA) in million US\$), family size (the natural logarithm of the sum of TNAs of all funds that belong to the same family), 12b1 fees, a fund's expense ratio (excluding 12b1 fees)¹³, a dummy variable that indicates load fees, the prior-year standard deviation of monthly fund returns, twelve fractions of assets invested in each of the Fama-French 12 industries, year fixed effects, and 9 investment style dummy variables that are derived by estimating sensitivities of funds' past 24-month returns to the four factors from Carhart (1997), as described in section 4.1.

Because the inclusion of fund location data limits the number of regression observations significantly, we separately run regressions for testing the importance of fund location in explaining funds' controversial investments:

$$\begin{aligned}
 FundSCORE_{i,yr} = & c + \lambda_1 SRI_{i,yr-1} + \lambda_2 Religious_{i,yr-1} + \lambda_3 Institutional_{i,yr-1} + \\
 & \lambda_4 D_Strongreligion_{i,yr-1} + \lambda_5 D_strongDem_{i,yr-1} + \lambda_6 D_strongRep_{i,yr-1} + \\
 & \sum_{k=7}^K \lambda_k Controls_{i,k,yr-1} + \varepsilon_{i,y}
 \end{aligned} \tag{5}$$

where $D_strongreligion_{i,yr-1}$ equals 1 if the fund is located in the top 20% of U.S. states in terms of religious adherence, $D_strongDem_{i,yr-1}$ equals 1 if the fund is located in the top 20% of Democrat-leaning U.S. states in terms votes cast during presidential elections, and $D_strongRep_{i,yr-1}$ equals 1 if the fund is located in the top 20% of Republicans-leaning U.S. states. In addition, next to local political and religious factors, location as such might affect investment choices when socially sensitive business practices are well-established close to a fund's location. Covall (1999) showed that fund managers invest in stocks of companies that are geographically proximate, even within a single country. Eichholtz et al. (2012) find that the portfolio of a Real Estate Investment Trust (REIT) comprises more environmentally certified buildings when the trust is located in an area where green investment among REITS are more prevalent. Regarding individual investors, Hood et al. (2014) hypothesize a larger tilt towards sin stocks in the portfolios of investors who live in regions with a strong representation of

¹³ Since the fee data is on fund class level, we value-weight the fees.

tobacco and alcohol producers, and in typical gambling cities. Since these typical “sin states” might differ from other states in terms of religiosity and political climate, it is possible that such location effects may lead to spurious inferences about the effect of political preferences and religiosity on exposure to socially sensitive assets. We therefore augment our control variables with these potential location effects by adding to our controls a dummy *D_AlcState* for states with per-capita alcohol consumption in the top 20% of the U.S., a dummy *D_TobState* for the six major tobacco-producing states (GA, KY, NC, SC, TN, and VA; see Hood et al., 2014), and a dummy *D_GameState* for states with commercial casino operations.

Table 3 shows the results of estimating specification 4. We find that SRI funds score on average lower along all four measures of socially sensitive investment exposure. The style-adjusted exposure of the average SRI fund to stocks from classical sin sectors (tobacco, alcohol and gambling) is *ceteris paribus* about 1.3% lower according to the coefficients on *FundSIN_HK*, *FundSIN_STATS*, and *FundSIN_all*. SRI funds are also less exposed to socially sensitive assets when we broaden the definition of sin stocks to include weapons and nuclear energy, as measured by *FundBROADSIN*.

In contrast to SRI funds, Table 3 suggests that mutual funds with an explicit religious affiliation are not significantly less invested in sin stocks as measured by *FundSIN* as well as by broader measures of sin stock involvement. It is possible that the coefficient on *Religious Fund* is not significantly different from zero because of a strong overlap between religious funds and SRI funds. Robustness tests, which we do not report here, confirm that the coefficient on *Religious Fund* becomes statistically significant with the expected sign once *SRI* is dropped from the regressions. We therefore also break down our SRI and religious fund identifiers into “non-religious SRI funds”, “religious non-SRI funds”, and “religious SRI funds.” The results in Table 3 indicate that non-religious SRI funds are less invested in sin stocks across all sin-stock definitions we consider, but

religious non-SRI funds on average do not display statistically significant underweighting in these stocks.

In addition to SRI funds, funds with a greater fraction of assets under management stemming from institutional share classes have a lower exposure to socially sensitive stocks according to five of the eight regression models presented in Table 3. These results reasonably support the idea that mutual funds cater to potentially norms-sensitive institutional clientele by avoiding sin stocks, but this conclusion mainly finds support in narrower definitions of sin stocks.

Table 4 shows whether mutual funds' exposure to sin stocks depends on religiosity and political preferences in the State where the fund is located, based on specification (5). The negative and statistically significant coefficient concerning $D_strongDem_i$ indicates that funds located in states that strongly favor the Democratic party are in smaller proportions invested in sin stocks if we identify these stocks using the Hong and Kacperczyk (2009) approach ($FundSIN_HK$). In contrast, when mutual funds' exposures to sin stocks are measured by our alternative measures $FundSIN_STATS$ and $FundBROADSIN$, the coefficients on $D_strongDem_i$ are no longer significantly different from zero. When $FundSIN_All$ is used as dependent variable, we find that location in strongly Democrat-leaning states is significantly associated with lower sin stock exposure. Funds located in Republican-leaning states do not appear to be more or less invested in sin stocks, regardless of how we measure funds' sin stock exposure.

As for local religiosity, three of the four models presented in Table 4 point to a positive relation between the level of religiosity in the state where the fund is located and sin stock exposure. All three models measure sin stock exposure by involvement with tobacco, alcohol and gambling - either using the method of Hong and Kacperczyk (2009), the STATS database, or both. These results do not support the idea that religiosity is associated with greater aversion to socially sensitive investments.

Regarding our control variables, we controlled for the possibility that funds located in typical tobacco, alcohol and gambling states tilt to sin stocks, regardless of political values and religion in that state. Of those location variables, the control variable pertaining to location in typical gambling states is significantly positively associated with exposure to *FundSIN_STATS* and *FundBROADSIN*.

Note that the coefficient on *Institutional* in Table 4 is not significantly different from zero, unlike the coefficients reported in Table 3, which we attribute to the reduction in sample size caused by the inclusion of location variables.

Taken together, Tables 3 and 4 indicate that SRI funds on average are tilted to sin stocks regardless of the sin stock definition we employ to score mutual funds. The variables related to institutional clientele in Table 3 and funds' local political and religious environment in Table 4 are significantly related to sin stock exposure, but this conclusion leans on the definition of sin stocks we consider. The relationships appear most robust when mutual funds' scores rely entirely or in part on the "sin stock" definition of Hong and Kacperczyk (2009). These findings suggest that norms and values affect investment choices mainly in regards to companies whose primary businesses are heavily rooted in the three classic sin sectors of tobacco, alcohol and gambling (as indicated by industry classification codes). Because the results are less significant once funds are evaluated along more loose sin stock definitions, it stands to reason that values and norms do not materially influence the degree of investments in companies that are merely distantly associated with controversial business activities.

Since mutual funds' scores derived from more narrow definitions of sin stock exposure are more significantly related to the variables we consider to identify norms and values in investment decisions, a natural follow-up question is whether more narrow measures of funds' sin stock exposure are also more important determinants in the cross-section of mutual funds returns. We turn to this question in the next section.

4.3 Socially sensitive assets and the cross-section of mutual fund returns

The previous section focused on explaining mutual funds' exposure to socially sensitive stocks. This section turns to the payoff associated with such exposures. To understand the payoff associated with controversial stock investments, as witnessed in mutual fund holdings, we first perform pooled cross-section regressions with monthly risk-adjusted fund returns $aret_{i,t}$ as dependent variable and measures of mutual funds' controversial investments as the independent variables that are central to this study. Our regression models are written as:

$$aret_{i,t} = c + \gamma_1 Fund\ Score_{i,t-1} + \sum_{k=2}^K \gamma_k Controls_{i,k,t-1} + \varepsilon_{i,t} \quad (6)$$

where $aret_{i,t}$ is the monthly return of mutual fund i in excess of the return predicted by the Carhart (1997) four-factor model as in equation (2) shown earlier:

$$R_{i,t} - R_f = \alpha_i + \beta_{0,i}(R_{m,t} - R_{f,t+1}) + \beta_{1,i}SMB_t + \beta_{2,i}HML_t + \beta_{3,i}MOM_t + \varepsilon_{i,t} \quad (2)$$

$aret_{i,t}$ is then defined as:

$$aret_{i,t} = \alpha_i + \varepsilon_{i,t} \quad (6b)$$

In independent regressions involving model (6), we allow for permutations of four different independent $Fund\ Score_{i,t-1}$ variables, which served as dependent variable in the previous section. Included in the vector $Controls_{i,k,t-1}$ are fund-specific characteristics, style fixed effects, and year-month fixed effects. Next to a control variable for explicit SRI funds, we include fund-specific

controls that are common in the literature on the mutual fund performance (e.g., Carhart, 1997; Amihud and Goyenko, 2013; Renneboog et al., 2008): a dummy variable that indicates load fees, the natural logarithm of fund age, fund size, family size, fund flow (following the approach of Sirri and Tufano (1998)), 12b1 fees, a fund's expense ratio (excluding 12b1 fees)¹⁴, idiosyncratic volatility (based on the fund's residual returns from the four-factor model over the past 12 months, and 9 investment style dummy variables derived from funds' loading on the four factors from Carhart (1997)).

Table 5 shows the results. According to the reported coefficients on the control variables, funds have higher returns when they previously had lower 12b1 fees, larger money inflows, fewer assets under management, a larger fund family, and less idiosyncratic risk as measured by R^2 from a four-factor regression. As for the main variables that are central to this study, Table 5 provides evidence of a positive and statistically significant payoff associated with funds' exposure to sin stocks, when measured by involvement with tobacco, alcohol and gaming sectors.¹⁵ As for economic significance, the coefficient on sin stock exposure as measured by *FundSIN_HK* is 0.61, which suggests that a standard-deviation increase from style-adjusted sin stock exposure is associated with annualized increase in risk-adjusted return of about 0.21%. As we adopt looser definitions of sin stocks, we find that the coefficient on funds' sin stock exposure eventually becomes insignificant. The relation between our broadest measure of funds' sin stock exposure – *FundBROADSIN* - and risk-adjusted returns is not statistically significant regardless of the way standard errors are computed.

So far, the results based on holdings data suggest that sin stock exposure does appear to be associated with positive payoffs. But its magnitude is smaller than the return differences between

¹⁴ Since the fee data is on fund class level, we value-weight the fees.

¹⁵ Using raw monthly fund returns instead of risk-adjusted returns yields qualitatively similar results.

hypothetical sin stock portfolios and sin-free portfolios seen in earlier studies (e.g, Hong and Kacperczyk 2009). Furthermore, consistent with our observation that values and norms drive sin stock exposures mainly along rather narrow definitions (i.e., tobacco, alcohol and gambling), we find that funds' returns are significantly higher when they score higher on narrow measures of sin stock exposure (i.e., *FundSIN_HK*, *FundSIN_STATS*, and *FundSIN_All*).

Next to the payoff associated with sin stock exposure among mutual funds, another interesting observation in Table 5 concerns the *SRI* variable. The coefficient on the dummy variable for explicit SRI funds is not significantly different from zero, which is consistent with the vast majority of studies that compare the returns of SRI-labeled funds in the U.S. with those of conventional funds. (Moreover, in analyses that are not reported here, the coefficient on *SRI* continues to be insignificant when Funds' scores on exposure to socially sensitive stocks are dropped from the regressions.) That risk-adjusted mutual fund return is predicted by an actual holdings-based measure of sin stock investment and not by an explicit SRI label could be taken to imply that SRI funds do not have materially lower exposures to socially sensitive stocks, even though they score significantly lower on sin stock exposure on average from a statistical point of view. A related explanation, which can be inferred from the results so far, is that exposures to sin stocks are generally not sufficiently diverse across funds to see the payoff translated into differences in returns, precisely because numerous SRI and non-SRI funds shun socially sensitivity stocks.

4.3. Mutual fund quartiles formed on exposure to socially sensitive stocks

Another way to assess the economic significance of performance differences arising from sin stock exposure is to form rank portfolios of mutual funds. Every year, we rank all funds on one of their fund scores and then allocate funds to one of four quartiles. We collect monthly returns on each portfolio for the next twelve months. By annually ranking funds using updated mutual fund scores, we eventually obtain monthly returns on mutually exclusive quartile portfolios, which differ along the aforementioned

scores, for the period January 2004-December 2012. If exposure to socially sensitive stocks plays an important role in mutual fund performance, we would expect to see a positive risk-adjusted return difference between top-ranked and bottom-ranked quartile portfolios.

Table 6 shows risk-adjusted average returns per quartile based on the intercept from a four-factor model (as in specification (2)). Panel A shows returns for quartiles portfolios that are formed by weighing each fund in the quartile based on its total net assets (TNA) under management relative to the quartile's total TNA. In addition, we provide a high minus low (H-L) portfolio to illustrate the risk-adjusted return difference between the high-ranked and low-ranked quartile. Panel B presents the H-L return if we assign equal weights to mutual funds in each quartile instead of TNA-based weights.

The results in Table 6 indicate that the annualized risk-adjusted return difference between top- and bottom-ranked funds is statistically not significant, regardless of the score we consider to rank funds on their socially sensitive stock exposure.¹⁶ For two of the four TNA-weighted H-L quartiles, the average annualized risk-adjusted return is in the range of 0.47% to 0.69%, which is not significant at the conventional cut-off levels. We continue to find non-significant return differences between H and L if we use equal-weighted quartiles. These non-significant performance differences contrast with the large sin stock premiums from earlier literature on hypothetical sin stock portfolios.

Panel A of Table 7 sheds more light on the underlying sin stock exposure of each quartile that was formed in this section, which are derived by taking within each quartile the average of all funds' style-adjusted scores. The difference in *FundSIN_STATS* between the high-ranked and low-ranked quartiles is about two standard deviations. Given that the results of Table 4 imply a 0.21% payoff associated with a standard deviation of sin stock exposure, we would need a difference in sin stock exposure between high- and low-ranked quartiles of over four standard deviations in order to obtain an expected return difference of 1%. This estimated performance difference is still well below the annualized return difference between sin stocks and non-sin stocks that studies have reported using hypothetical portfolios. Our holdings-based analysis therefore suggests that exposures to socially

¹⁶ We also considered tercile and quintile portfolios of mutual funds, the results remain virtually unchanged for these fund selection procedures.

sensitive stocks are not sufficiently diverse across mutual funds to cause material differences in their returns.

5. Additional tests

5.1. Local Catholic versus Protestant religion

Our main analysis suggests that mutual funds in a more religious local environment are more exposed to controversial stocks, despite the widely held view that objections against investment in sin stocks such as alcohol and tobacco partially have religious roots. By using local religiosity as independent variable, we implicitly assumed that religious people have homogenous beliefs about what constitutes undesirable stocks. In their study on individual investors, Hood et al. (2014) contend that it is what religion is followed rather than being religious that explains social investment behavior, and breaks down household location by various types of religion at the country level. Given that prior studies such as Salaber (2012) and Hood et al. (2014) suggest that Catholics are less averse to sin stocks than for instance Protestants, we relax our assumption in a number of robustness tests in which we examine whether the prevalence of a Catholic or Protestant religion affects mutual funds' investments. Results, which we do not tabulate here, indicate that funds in more Catholic states exhibit greater exposure to our narrower set of sin stocks, consistent with Hood et al. (2014), whereas Protestants display greater exposure to our broader class of controversial stocks. Hence, we do not find evidence that the prevalence of any these religions leads to a reduction in the sin stock investments of mutual funds managers.¹⁷

5.2. Alternative scores: social "concerns" and "strengths"

While our main analysis has focused on mutual funds' exposure to stocks from a set of well-known socially sensitive sectors, investors' social considerations may stretch beyond these controversial

¹⁷ We also computed a Catholic-to-Protestant ratio similar to Kumar et al. (2012), which revealed a positive association with sin stock exposure.

business areas. In addition to screening sin stocks, various investors are known to employ so-called “negative” screens to identify firms that display weaknesses in social areas such as human rights, employee relations, diversity, and community relations. In principle, stocks of companies with weaknesses in these areas might also have a higher expected return if many investors shun them due to social norms or values. Heinkel et al. (2001) provide a theoretical model that connects environmental concerns to higher expected returns for polluting firms, and empirical results in El Ghouli et al. (2011) and Chava (2014) suggest that firms with environmental and social concerns have a higher implied cost of equity capital. Alternatively, at the other end of the social performance spectrum, firms that display leadership in these social areas might have lower expected returns.

However, unlike more clear-cut controversial business indicators like alcohol, tobacco and gambling, it is not obvious that a sufficient number of investors agree on the stocks that are undesirable on the basis of these alternative social and environmental performance measures. For example, Hood et al. (2014) find that U.S. individual investors do not have preferences for stocks based on the same social features. They also show that individual investors located in areas with relatively more support for the Democratic Party *underweighted* investments in stocks with environmental *strengths*, which runs counter to theoretical predictions.¹⁸ If social concerns do not translate into boycotts of a specific set of stocks by a large base of investors, then one would not expect that exposure to these stocks affects mutual fund returns in the cross-section.

Whether social concerns (strengths) indicators of companies affect the investment choices and performance of mutual funds is thus an interesting additional question that we explore in this

¹⁸ Furthermore, several studies suggest that firms with strong environmental and social scores have historically been associated with positive abnormal stock returns (e.g., Edmans, 2011; Borgers et al., 2013; Eccles et al., 2014), but less so in recent years (Borgers et al, 2013; Bebchuck et al, 2012). These findings could be taken to imply that stocks with strong social features attract not only fund managers who translate norms and value into investment choices but also any other investor who seeks to improve the return/risk tradeoff.

section. We created two measures of a fund’s exposure to environmental and social concerns and strengths using all ESG indicators from STATS adjusted for industry and market capitalization.¹⁹

$$FundCONCERNS_{i,yr,q} = \sum_{j=1}^J weight_{i,j,yr,q} * Adj_firm_CON_{j,yr-1} \quad (7)$$

$$FundSTRENGTHS_{i,yr,q} = \sum_{j=1}^J weight_{i,j,yr,q} * Adj_firm_STR_{j,yr-1} \quad (8)$$

where $Adj_firm_CON_{j,yr-1}$ ($Adj_firm_STR_{j,yr-1}$) equals 1 if a firm belongs to the top (bottom) 20 percent of firms ranked on all size- and industry-adjusted ESG concerns (strengths) covered by STATS and bottom 20 percent in terms of total adjusted ESG strengths (concerns).

The coefficients regarding *SRI* in Table 8 indicate that SRI funds are significantly less exposed to stocks with strong (adjusted) ESG concerns and more exposed stocks with ESG strengths. *Religious* on the other hand neither influences funds’ ESG concerns nor affects ESG strengths. In fact, models that include the interaction term *SRI*Religious* indicate that SRI funds exhibit weaker (stronger) exposure to stocks with ESG concerns (strengths) but much less so when they have an explicit religious affiliation. Furthermore, while funds with a greater fraction of assets from institutional shares displayed weaker exposure to sin stocks in some of our main analyses, they do not shun stocks with strong ESG concerns. In fact, they also appear to invest in smaller proportions in stocks with ESG strengths. Table 9 shows that funds’ ESG-strengths and ESG-concerns scores are related to the funds’ local religious and political environment, but not all coefficients corroborate our expectations. Funds with a strongly religious local environment have score significantly lower on ESG concerns and marginally higher on ESG strengths. Surprisingly, funds that are located in states that strongly favor the Democratic Party reveal a significantly greater exposure to stocks with strong ESG concerns. In addition, these funds

¹⁹ Industry and firm size are especially known to affect the number social and environmental indicators from STATS (e.g. Kempf and Osthoff, 2007; Statman and Glushkov, 2009). For example, we found that large firms in the natural resources industry have more ESG concerns as well as strengths indicators than do small and midsized financial services firms.

display weaker exposure to stocks with ESG strengths, which is in line with the investment tilts that Hood et al. (2014) document for households domiciled in Democrat-leaning counties.

Table 10 reports on the payoff associated with exposure to stocks identified as having strong ESG concerns, and the payoff associated with strong ESG strengths. We find that neither the coefficient on *FundSTRENGTH* nor the coefficient on *FundCONCERNS* is significantly different from zero. Hence, while this section shows that the drivers of funds' ESG strengths and concerns scores are to a certain extent consistent with expectations, ESG exposures in mutual fund holdings, as measured through the STATS database, are nevertheless not associated with a significant payoff.

6. Conclusion

So far, there has been mixed evidence concerning the question whether social norms and values have a sufficiently widespread impact on investor behavior in order to influence asset prices. This paper provides a deeper look at the materiality of social considerations in the financial market by studying the holdings and returns of domestic U.S. equity mutual funds over the period 2004-2012. Our findings complement prior studies that link mutual fund managers' political contributions to socially conscious investment, and to studies on the determinants of social investing by specific institutional and individual investors.

While most previous studies have linked social considerations in investing to specific institutions and individuals, this study suggests that social considerations also factor into mutual fund managers' portfolios. The results indicate that next to explicitly socially conscious funds, various conventional funds display social dimensions in their holdings that can be explained by variables that describe the nature of funds' targeted clientele, local political preferences, and local religiosity. These variables are significantly related to funds' investment in stocks of firms that have their core operations in "sin" (tobacco, alcohol and gambling) industries, but less related to investments in a broader set of controversial stocks that may be more distantly associated with core controversies.

That social considerations by investors mainly translate into avoidance of core sin industries finds further support in our analysis of mutual fund returns. The estimated payoff per fraction invested in socially sensitive stocks is positive and statistically significant for the smallest subset of classic sin sectors. Beyond these specific social dimensions, we did not find robust evidence that exposures to a broader set of "sin" stocks and stocks with ESG strengths and concerns influences risk-adjusted mutual fund returns. However, while these results support the hypothesis that investor boycotts cause sin stocks to have higher expected returns, we also found that most mutual funds do not display sizable exposures to these controversial assets in order to generate higher returns. Due to limited cross-

sectional variation in sin stock exposure, the annualized risk-adjusted return spread between a portfolio of funds with highest sin scores and its lowest-ranked counterpart was not significantly different from zero over the period January 2004 – December 2012. The results could be taken to imply that fund managers do not tilt towards controversial stocks exactly because of social considerations, and possibly also due to practical constraints (such as benchmark restrictions).

We expect that there is ample potential for future research to shed more light the drivers of socially conscious investing based by means of mutual fund holdings, more refined fund location data, and information about socioeconomic data about fund managers. Future research could also focus on the question why some funds do not market themselves explicitly as “SRI” when the social profiles of their holdings are nevertheless in line with those of explicit SRI funds.

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Table 1. Mutual fund summary statistics.

	Obs	Mean	Std. Dev.	Min	Max
<i>Fund Scores</i>					
Unadj.FundSIN_HK	6434	0.024	0.027	0.000	0.567
Unadj. FundSIN_STATS	6443	0.041	0.038	0.000	0.749
Unadj.FundSIN_All	6434	0.044	0.036	0.000	0.680
Unadj.FundBROADSIN	6443	0.134	0.080	0.000	1,000
FundSIN_STATS	6443	0.000	0.025	-0.044	0.534
FundSIN_HK	6434	0.000	0.034	-0.081	0.690
FundSIN_All	6434	0.000	0.031	-0.086	0.625
FundBROADSIN	6443	0.000	0.057	-0.204	0.966
<i>Fund Characteristics</i>					
SRI	6443	0.027	0.161	0.000	1,000
Religious	6443	0.021	0.142	0.000	1,000
Institutional	6443	0.183	0.330	0.000	1,000
Fund size	6443	1626	5878	5	161912
Family size	6432	138235	301221	7	2991189
Age (months)	6443	178	152	21	1021
Flow	6324	-0.005	0.0417	-0.297	0.572
12b1	6443	0.001	0.002	0.000	0.010
Expense ratio	6443	0.013	0.005	0.000	0.089
Load fee indicator	6443	0.519	0.500	0.000	1,000

Reported are descriptive statistics on the sample of mutual funds that received scores concerning socially sensitive investments. *Unadj. FundSIN_HK* measures the fraction of stocks invested in sins stocks, derived stocks' SIC and NAICS codes using the approach of Hong and Kacperczyk (2009). *Unadj. FundSIN* measures the fraction of total net assets that a fund is invested in stocks associated with tobacco, alcohol, and gambling according to MSCI STATS. *Unadj. FundSIN_All* measures the fraction in stocks identified as sin either by STATS or by means of SIC and NAICS codes. *Unadj. FundBROADSIN* measures the fraction of total net assets that a fund is invested stocks associated with tobacco, alcohol, gambling, weapons/defense, and nuclear operations according to MSCI STATS. The fund characteristics are presented for the period 2004-2012. A fund is defined as *SRI* if it has at least one explicit social investment screen. *Religious* denotes religiously affiliated funds. *Age* is the natural logarithm of the age of the oldest share class of the mutual fund, *Fund size* is the natural logarithm of the total net assets (TNA) of the fund, *Family size* is the natural logarithm of accumulated TNAs of funds that belong to the same fund family, *Load fee indicator* is a dummy for the presence of load fees, *12b1* is the fraction of 12b1 fees while all other expenses fall under the *Expense ratio*. *Flow* is inferred from total net assets using the approach suggested in Sirri and Tufano (1998).

Table 2. Conventional funds' exposure to socially sensitive stocks by quartile net of average SRI fund's exposure

	<i>FundSIN_HK</i>	<i>FundSIN_STATS</i>	<i>FundSIN_All</i>	<i>FundBROADSIN</i>
Lowest quartile - SRI	-0.011*** (-26.406)	-0.019*** (-26.242)	-0.020*** (-29.297)	-0.013*** (-8.700)
2nd – SRI	0.002*** (6.737)	0.001 (0.942)	-0.002*** (-3.033)	0.032*** (33.430)
3rd – SRI	0.012*** (37.872)	0.016*** (27.670)	0.013*** (24.145)	0.062*** (62.636)
Highest quartile - SRI	0.039*** (26.359)	0.053*** (29.705)	0.047*** (28.937)	0.120*** (52.733)

Table 2 reports for non-SRI funds the equal-weighted average exposure to socially sensitive stocks by quartile after subtracting the sample-average exposure for all SRI funds. Non-SRI funds are allocated to quartiles based on one of the four measures of exposure to socially sensitive stocks: *FundSIN_STATS*, *FundSIN_HK*, and *FundSIN_All*, and *FundBROADSIN*. Standard deviations are in parentheses. The *t* statistics on the difference in exposure between SRI funds (as a whole) and a particular quartile of non-SRI funds is derived from a two-tailed test, and is presented in parentheses. *, **, and *** represent significance levels of 10%, 5%, and 1%, respectively.

Table 3. Determinants of funds' exposure to socially sensitive investment

	<i>FundSIN_HK</i>		<i>FundSIN_STATS</i>		<i>FundSIN_All</i>		<i>FundBROADSIN</i>	
<i>SRI</i> _{<i>i,yr-1</i>}	-1.312*** (-4.920)	-1.177*** (-3.543)	-1.213*** (-3.038)	-1.078** (-2.374)	-1.205*** (-3.687)	-1.144*** (-2.646)	-4.880*** (-5.396)	-5.511*** (-5.362)
<i>Religious</i> _{<i>i,yr-1</i>}	0.070 (0.263)	0.266 (0.997)	-0.240 (-1.059)	-0.042 (-0.234)	0.043 (0.168)	0.133 (0.569)	0.698 (1.080)	-0.231 (-0.359)
<i>SRI * Religious</i>		-0.583 (-0.996)		-0.587 (-1.185)		-0.266 (-0.414)		2.752 (1.527)
<i>Institutional</i> _{<i>i,yr-1</i>}	-0.237** (-2.168)	-0.240** (-2.229)	-0.259 (-1.623)	-0.262* (-1.652)	-0.240* (-1.739)	-0.242* (-1.755)	-0.111 (-0.414)	-0.094 (-0.352)
<i>l_age</i> _{<i>i,yr-1</i>}	0.011 (0.144)	0.011 (0.146)	0.021 (0.241)	0.021 (0.244)	0.088 (0.888)	0.088 (0.887)	0.309** (2.097)	0.307** (2.085)
<i>l_size</i> _{<i>i,yr-1</i>}	-0.028 (-0.809)	-0.028 (-0.809)	-0.061 (-1.246)	-0.061 (-1.248)	-0.059 (-1.470)	-0.059 (-1.471)	-0.182* (-1.700)	-0.182* (-1.695)
<i>l_12b1</i> _{<i>i,yr-1</i>}	72.916*** (3.356)	72.625*** (3.351)	100.893*** (3.111)	100.624*** (3.109)	86.081*** (3.293)	85.948*** (3.290)	195.695*** (3.367)	196.956*** (3.387)
<i>l_exp_ratio</i> _{<i>i,yr-1</i>}	-24.208** (-2.095)	-23.316** (-1.980)	-28.512 (-1.268)	-27.622 (-1.212)	-37.604** (-2.106)	-37.197** (-2.048)	-34.873 (-1.119)	-39.042 (-1.247)
<i>Dload_fees</i> _{<i>i,yr-1</i>}	0.052 (0.412)	0.052 (0.417)	0.168 (1.051)	0.168 (1.055)	0.043 (0.266)	0.043 (0.268)	-0.302 (-1.366)	-0.305 (-1.376)
<i>l_family_size</i> _{<i>i,yr-1</i>}	-0.007 (-0.242)	-0.007 (-0.241)	0.044 (1.133)	0.044 (1.135)	0.016 (0.376)	0.016 (0.376)	0.064 (1.051)	0.064 (1.042)
<i>ret volatility</i> _{<i>i,yr-1</i>}	-6.103*** (-2.763)	-6.246*** (-2.911)	-4.491 (-1.641)	-4.637* (-1.730)	-3.170 (-1.288)	-3.235 (-1.344)	-29.679** (-2.142)	-28.998** (-2.079)
<i>Constant</i>	33.591*** (9.722)	33.582*** (9.725)	37.382*** (8.465)	37.373*** (8.464)	35.534*** (8.178)	35.530*** (8.182)	27.393*** (5.543)	27.439*** (5.564)
<i>Style FE</i>	YES	YES	YES	YES	YES	YES	YES	YES
<i>Industry exposures</i>	YES	YES	YES	YES	YES	YES	YES	YES
<i>Year FE</i>	YES	YES	YES	YES	YES	YES	YES	YES
Observations	6,053	6,053	6,053	6,053	6,053	6,053	6,053	6,053
R-squared	0.251	0.251	0.198	0.198	0.199	0.199	0.190	0.191

We perform pooled cross-section regressions, with funds' style-adjusted exposure to socially sensitive stocks (*FundSIN_KLD*, *FundBROADSIN*, *FundSIN_HK*, and *FundSIN_All*) as dependent variable and as independent variables: a dummy for SRI funds (*SRI*_{*i,yr-1*}), a dummy for religious funds (*Religious*_{*i,yr-1*}) the fraction of assets under management from institutional investor share classes (*Institutional*_{*i,yr-1*}) a fund's age, (*l_age*_{*i,yr-1*}: the natural logarithm of the age of the oldest share class of the mutual fund), *l_size*_{*i,yr-1*} (the natural logarithm of the total net assets (TNA) of the fund), *l_family_size*_{*i,yr-1*} (the natural logarithm of accumulated TNAs of funds that belong to the same fund family), a dummy for the presence of load fees, (*Dload_fees*), and that of other expenses (*l_exp_ratio*_{*i,yr-1*}), the prior-year standard deviation of monthly returns (*ret volatility*_{*i,yr-1*}), twelve portfolio weights in each of the twelve Fama-French industries from Kenneth French's library (*Industry exposures*_{*i,yr-1*}), year fixed effects (*Year FE*), and style fixed effects derived from funds' four-factor betas (*Style FE*). *T* statistics derived from two-way clustered standard errors are presented in parentheses. Coefficients are multiplied by 100 for expositional convenience. *, **, and *** represent significance levels of 10%, 5%, and 1%, respectively.

Table 4. Mutual funds' socially sensitive investment exposures: location variables

	<i>FundSIN_HK</i>		<i>FundSIN_Stats</i>		<i>FundSIN_All</i>		<i>FundBROADSIN</i>	
<i>SRI</i> _{<i>i,yr-1</i>}	-1.322***	-1.274***	-1.463***	-1.285**	-1.356***	-1.331**	-5.721***	-6.461***
	(-3.846)	(-2.959)	(-2.680)	(-2.178)	(-3.163)	(-2.513)	(-5.466)	(-6.077)
<i>Religious</i> _{<i>i,yr-1</i>}	-0.246	-0.151	-0.057	0.305	-0.043	0.008	0.844	-0.656
	(-0.936)	(-0.814)	(-0.206)	(1.380)	(-0.146)	(0.033)	(1.188)	(-0.972)
<i>SRI * Religious</i>		-0.224		-0.852		-0.121		3.532**
		(-0.339)		(-1.641)		(-0.164)		(2.541)
<i>Institutional</i> _{<i>i,yr-1</i>}	-0.296	-0.300	-0.220	-0.232	-0.241	-0.243	-0.178	-0.127
	(-1.447)	(-1.481)	(-0.906)	(-0.963)	(-1.066)	(-1.074)	(-0.468)	(-0.333)
<i>D_strongreligion</i> _{<i>i,yr-1</i>}	0.385**	0.379**	0.344*	0.322	0.469**	0.465**	0.352	0.444
	(2.350)	(2.283)	(1.712)	(1.576)	(2.415)	(2.362)	(0.953)	(1.231)
<i>D_strongDem</i> _{<i>i,yr-1</i>}	-0.255**	-0.251**	-0.195	-0.178	-0.568***	-0.566***	0.202	0.132
	(-2.228)	(-2.195)	(-1.472)	(-1.312)	(-4.126)	(-3.999)	(0.472)	(0.325)
<i>D_strongRep</i> _{<i>i,yr-1</i>}	-0.043	-0.040	0.213	0.224	0.149	0.151	0.132	0.087
	(-0.320)	(-0.298)	(1.183)	(1.236)	(0.915)	(0.926)	(0.464)	(0.305)
<i>D_TobState</i> _{<i>i,yr-1</i>}	0.941	0.939	0.288	0.281	0.375	0.374	1.094	1.124
	(1.137)	(1.133)	(0.393)	(0.383)	(0.481)	(0.480)	(0.924)	(0.950)
<i>D_GameState</i> _{<i>i,yr-1</i>}	0.174	0.174	0.413**	0.413**	0.231	0.231	0.790***	0.787***
	(1.554)	(1.554)	(2.235)	(2.236)	(1.450)	(1.448)	(2.885)	(2.870)
<i>D_AlcState</i> _{<i>i,yr-1</i>}	-0.184	-0.182	0.333	0.338	0.070	0.071	0.338	0.315
	(-0.642)	(-0.635)	(0.704)	(0.715)	(0.175)	(0.177)	(0.594)	(0.549)
<i>Fund controls</i>	YES	YES	YES	YES	YES	YES	YES	YES
<i>Industry exposures</i>	YES	YES	YES	YES	YES	YES	YES	YES
<i>Style FE</i>	YES	YES	YES	YES	YES	YES	YES	YES
<i>Time FE</i>	YES	YES	YES	YES	YES	YES	YES	YES
Observations	4,187	4,187	4,187	4,187	4,187	4,187	4,187	4,187
R-squared	0.253	0.253	0.231	0.231	0.218	0.218	0.234	0.236

We perform pooled cross-section regressions, with funds' style-adjusted exposure to socially sensitive stocks (*FundSIN_KLD*, *FundBROADSIN*, *FundSIN_HK*, and *FundSIN_All*) as dependent variable and as independent variables: a dummy variable that equals 1 if the fund is located in the top 20% of U.S. states in terms of religious adherence (*D_strongreligion*_{*i,t-1*}), a dummy that equals 1 if the fund is located in the top 20% of Democrat-leaning U.S. states in terms votes cast during presidential elections (*D_strongDem*_{*i,t-1*}), a dummy that equals 1 if the fund is located in the top 20% of Republicans-leaning U.S. states in terms votes cast during presidential elections (*D_strongRep*_{*i,t-1*}), dummy variables indicating respectively whether the funds is located a top-20% state in terms of consumption of Alcohol (*D_AlcState*_{*i,t-1*}), Tobacco (*D_TobState*_{*i,t-1*}) and Gaming (*D_GameState*_{*i,t-1*}), a dummy for explicit SRI funds (*SRI*_{*i,t-1*}), a dummy for explicitly religious funds (*Religious*_{*i,yr-1*}), the interaction term for SRI and religious funds (*SRI*Religious*), the fraction of assets under management from institutional investor shares classes (*Institutional*_{*i,t-1*}), the fund-specific controls variables (*l_{age}*_{*i,t-1*}, *l_{size}*_{*i,t-1*}, *l_{family_size}*_{*i,t-1*}, *Dload_fees*, *l_{exp_ratio}*_{*i,t-1*}, *ret volatility*_{*i,t-1*}), twelve fractions of assets invested in each of the twelve Fama-French industries (*FF12 Industry exposures*_{*i,t-1*}), year fixed effects (*Year FE*), and style fixed effects derived from funds' four-factor betas (*Style FE*). *T* statistics derived

from two-way clustered standard errors are presented in parentheses. Coefficients are multiplied by 100 for expositional convenience. *, **, and *** represent significance levels of 10%, 5%, and 1%, respectively.

Table 5. Payoff to controversial investment in cross-section of fund returns

	<i>FunSIN_HK</i>	<i>FundsIN_STATS</i>	<i>FundSIN_All</i>	<i>FundBROADSIN</i>
<i>Fundscore</i>	0.709 (2.775)***	0.611 (2.448)**	0.643 (3.582)***	0.531 (2.898)***
<i>l_flow_{i,t-1}</i>		0.494 (2.673)***	0.479 (2.591)***	0.490 (2.656)***
<i>R2Carhart_{i,t-1}</i>		-0.719 (-4.485)***	-0.678 (-4.215)***	-0.717 (-4.486)***
<i>SRI_{i,t-1}</i>		-0.017 (-0.399)	-0.025 (-0.555)	-0.019 (-0.435)
<i>l_age_{i,t-1}</i>		-0.004 (-0.427)	-0.003 (-0.411)	-0.004 (-0.490)
<i>l_size_{i,t-1}</i>		-0.011 (-2.144)**	-0.011 (-2.195)**	-0.011 (-2.128)**
<i>l_12b1_{i,t-1}</i>		-7.702 (-1.941)*	-7.537 (-1.898)*	-7.714 (-1.949)*
<i>l_exp_ratio_{i,t-1}</i>		-2.803 (-0.568)	-2.923 (-0.594)	-2.780 (-0.563)
<i>Dload_fees_{i,t-1}</i>		0.022 (1.348)	0.021 (1.269)	0.022 (1.369)
<i>l_family_size_{i,t-1}</i>		0.012 (3.921)***	0.011 (3.753)***	0.012 (3.838)***
Constant	0.017 (2.749)***	0.774 (4.280)***	0.017 (2.690)***	0.743 (4.108)***
Style FE	YES	YES	YES	YES
Year*month FE	YES	YES	YES	YES
Observations	50,965	50,649	50,965	50,649
R-squared	0.000	0.081	0.000	0.082

We perform pooled cross-section regressions, with monthly Carhart (19974) risk-adjusted fund returns from rolling 24 month regressions as dependent variable and as independent variables in our complete models: one of the funds' style-adjusted exposures to socially sensitive stocks (*FundSIN_STATS*, *FundBROADSIN*, *FundSIN_HK*, and *FundSIN_All*), a dummy for explicit SRI funds (*SRI*), the natural logarithm of the age of the oldest share class of the mutual fund (*l_age_{i,t-1}*), *l_size_{i,t-1}* (the natural logarithm of the total net assets (TNA) of the fund), *l_family_size_{i,t-1}* (the natural logarithm of accumulated TNAs of funds that belong to the same fund family), the R-squared from the four-factor model over the past 24 monthly returns (*R2Carhart_{i,t-1}*), a dummy for load fees, (*Dload_fees*), the natural logarithm of 12b1 fees, (*l_12b1_{i,t-1}*) and that of other expenses (*l_exp_ratio_{i,t-1}*), past-month fund flow (*l_flow_{i,t-1}*) inferred from total net assets as in Sirri and Tufano (1998), year-month fixed effects, and style fixed effects derived from funds' rolling 24 month four-factor betas. *T* statistics derived from two-way clustered standard errors are presented in *round* brackets and derived from Newey-West corrected standard errors with 24 lags in *squared* brackets. Coefficients are multiplied by 100 for expositional convenience. *, **, and *** represent significance levels of 10%, 5%, and 1%, respectively.

Table 6. Performance of mutual funds that are ranked on exposure to socially sensitive assets

	TNA weighted					Equal weighted
	1/4 th (L)	2/4 th	3/4 th	4/4 th (H)	H-L	H-L
<i>FundSIN_HK</i>	0.16% (0.285)	-0.88% (-1.276)	-0.30% (-0.592)	0.84% (1.364)	0.69% (1.265)	0.18% (0.482)
<i>FundSIN_STATS</i>	0.47% (0.814)	-0.58% (-1.200)	-0.33% (-0.612)	0.41% (0.615)	-0.05% (-0.108)	-0.15% (-0.437)
<i>FundSIN_All</i>	-0.03% (-0.0562)	-0.18% (-0.337)	-0.30% (-0.582)	0.44% (0.690)	0.47% (0.838)	-0.18% (-0.644)
<i>Funds_BROADSIN</i>	0.64% (1.027)	0.12% (0.193)	-0.38% (-0.664)	-0.05% (-0.0777)	-0.69% (-1.098)	0.14% (0.384)

Every year, we rank all mutual funds in our sample for which holdings information is available on their exposure to socially sensitive stocks, using one of four scores: *FundSIN_STATS*, *FundBROADSIN*, *FundSIN_HK*, and *FundSIN_All*). We style adjust the scores by subtracting the mean of the score within each style group. Immediately following the ranking, we assign funds with high (low) scores to a portfolio composed of Top (Bottom) ranked funds. For each of the four scores, we form quartile portfolios based on the cross-sectional variation in the funds' scores. We compute the portfolios' monthly returns for the next twelve consecutive months. This procedure ultimately yields monthly post-formation returns from January 2004 to December 2012. We run Carhart (1997) four-factor regressions to estimate the risk-adjusted average return on each quartile. The first columns report risk-adjusted return on each quartile of funds based on weighting by funds total assets (TNA), and the difference in risk-adjusted return between the top and bottom quartile (H-L). The last column reports the risk-adjusted return difference between the top and bottom quartile based on equal weighting. *T* statistics are presented in parentheses.

Table 7. Funds' exposure to socially sensitive stocks: high-exposure versus low-exposure quartiles

	<i>FundSIN_HK</i>	<i>FundSIN_STATS</i>	<i>FundSIN_All</i>	<i>FundBROADSIN</i>
Lowest Quartile (L)	-0.021 (0.007)	-0.032 (0.012)	-0.030 (0.011)	-0.065 (0.029)
2 nd	-0.008 (0.003)	-0.012 (0.004)	-0.011 (0.004)	-0.018 (0.009)
3 rd	0.002 (0.004)	0.003 (0.005)	0.004 (0.005)	0.012 (0.010)
Highest quartile (H)	0.028 (0.032)	0.041 (0.039)	0.038 (0.035)	0.071 (0.047)

We report the equal-weighted average exposure to socially sensitive stocks by quartile, for each of the four mutual funds scores: *FundSIN_STATS*, *FundSIN_HK*, and *FundSIN_All* , and *FundBROADSIN*. Standard deviations are in parentheses.

Table 8. Determinants of funds' ESG "strengths" and "concerns": SRI and religious funds, and institutional clientele

	<i>FundCONCERNS</i>		<i>FundSTRENGTHS</i>	
<i>SRI</i> _{<i>i, yr-1</i>}	-1.000*	-1.341**	1.962***	2.364***
	(-1.722)	(-2.282)	(3.560)	(3.523)
<i>Religious</i> _{<i>i, yr-1</i>}	0.113	-0.388	-0.341	0.251
	(0.317)	(-1.052)	(-0.651)	(0.580)
<i>SRI * Religious</i>		1.484*		-1.752*
		(1.869)		(-1.907)
<i>Institutional</i> _{<i>i, yr-1</i>}	0.003	0.012	-0.274*	-0.285**
	(0.018)	(0.084)	(-1.940)	(-1.993)
<i>l_age</i> _{<i>i, yr-1</i>}	-0.100	-0.101	-0.091	-0.090
	(-1.236)	(-1.252)	(-0.699)	(-0.694)
<i>l_size</i> _{<i>i, yr-1</i>}	0.025	0.025	0.103**	0.103**
	(0.506)	(0.502)	(2.224)	(2.236)
<i>l_12b1</i> _{<i>i, yr-1</i>}	-6.145	-5.465	-35.240	-36.042
	(-0.178)	(-0.159)	(-0.964)	(-0.995)
<i>l_exp_ratio</i> _{<i>i, yr-1</i>}	-0.244	-2.491	-15.716	-13.063
	(-0.013)	(-0.127)	(-0.763)	(-0.644)
<i>DLoad_fees</i> _{<i>i, yr-1</i>}	0.251*	0.250*	-0.254	-0.252
	(1.693)	(1.689)	(-1.404)	(-1.410)
<i>l_family_size</i> _{<i>i, yr-1</i>}	0.014	0.014	-0.078**	-0.078**
	(0.506)	(0.504)	(-2.327)	(-2.329)
<i>ret volatility</i> _{<i>i, yr-1</i>}	9.310**	9.677**	-12.189*	-12.623*
	(2.333)	(2.533)	(-1.695)	(-1.795)
<i>Constant</i>	0.362	0.387	3.398	3.369
	(0.162)	(0.172)	(1.407)	(1.388)
Industry exposures	YES	YES	YES	YES
Style FE	YES	YES	YES	YES
Time FE	YES	YES	YES	YES
Observations	6,053	6,053	6,053	6,053
R-squared	0.051	0.051	0.052	0.053

Table 9. Determinants of Funds' ESG "concerns" and "strengths": location variables

	<i>FundCONCERNS</i>		<i>FundSTRENGTHS</i>	
<i>SRI</i> _{<i>i, yr-1</i>}	-1.009 (-1.494)	-1.101 (-1.581)	2.613*** (4.154)	2.901*** (3.712)
<i>Religious</i> _{<i>i, yr-1</i>}	0.253 (0.575)	0.066 (0.124)	-1.141*** (-2.841)	-0.558 (-1.521)
<i>SRI * Religious</i>		0.440 (0.506)		-1.374 (-1.139)
<i>Institutional</i> _{<i>i, yr-1</i>}	0.018 (0.100)	0.025 (0.136)	-0.178 (-0.884)	-0.198 (-0.955)
<i>D_strongDem</i> _{<i>i, yr-1</i>}	0.440** (2.162)	0.432** (2.129)	-0.374* (-1.957)	-0.346* (-1.720)
<i>D_strongRep</i> _{<i>i, yr-1</i>}	0.097 (0.479)	0.091 (0.450)	0.086 (0.368)	0.103 (0.436)
<i>D_strongreligion</i> _{<i>i, yr-1</i>}	-0.528*** (-2.884)	-0.516*** (-2.772)	0.463* (1.751)	0.427 (1.577)
<i>Constant</i>	-0.791 (-0.272)	-0.778 (-0.266)	4.775 (1.634)	4.735 (1.618)
<i>Fund & location controls</i>	YES	YES	YES	YES
<i>Industry exposures</i>	YES	YES	YES	YES
<i>Style FE</i>	YES	YES	YES	YES
<i>Year FE</i>	YES	YES	YES	YES
Observations	4,187	4,187	4,187	4,187
R-squared	0.068	0.069	0.061	0.062

We perform pooled cross-section regressions, with funds' social concerns and social strengths measures (*FundCONCERNS*, *FundSTRENGTHS*) as dependent variables and as independent variables: a dummy variable that equals 1 if the fund is located in the top 20% of U.S. states in terms of religious adherence (*D_strongreligion*_{*i, t-1*}), a dummy that equals 1 if the fund is located in the top 20% of Democrat-leaning U.S. states in terms votes cast during presidential elections (*D_strongDem*_{*i, t-1*}), a dummy that equals 1 if the fund is located in the top 20% of Republican-leaning U.S. states in terms votes cast during presidential elections (*D_strongRep*_{*i, t-1*}), dummy variables indicating respectively whether the funds is located a top-20% state in terms of consumption of Alcohol (*D_AlcState*_{*i, t-1*}), Tobacco (*D_TobState*_{*i, t-1*}) and Gaming (*D_GameState*_{*i, t-1*}), a dummy for explicit SRI funds (*SRI*_{*i, t-1*}), a dummy for explicitly religious funds (*Religious*_{*i, yr-1*}), the interaction term for SRI and religious funds (*SRI*Religious*), the fraction of assets under management from institutional investor shares classes (*Institutional*_{*i, t-1*}), the fund-specific control variables (*l*_{*age*}_{*i, t-1*}, *l*_{*size*}_{*i, t-1*}, *l*_{*family_size*}_{*i, t-1*}, *Dload_fees*, *l*_{*exp_ratio*}_{*i, t-1*}, *ret volatility*_{*i, t-1*}), twelve fractions of assets invested in each of the twelve Fama-French industries (*FF12 Industry exposures*_{*i, t-1*}), year fixed effects (*Year FE*), and style fixed effects derived from funds' four-factor betas (*Style FE*). *T* statistics derived from two-way clustered standard errors are presented in parentheses. Coefficients are multiplied by 100 for expositional convenience. *, **, and *** represent significance levels of 10%, 5%, and 1%, respectively.

Table 10. Payoff associated with mutual funds ESG strengths and concern scores

<i>FundCONCERNS</i>	0.045 (0.250)		0.040 (0.218)
<i>FundSTRENGTHS</i>		-0.063 (-0.316)	-0.059 (-0.297)
<i>l_flow_{i,t-1}</i>	0.453 (2.419)**	0.454 (2.422)**	0.453 (2.419)**
<i>R2Carhart_{i,t-1}</i>	-0.580 (-3.631)***	-0.583 (-3.629)***	-0.582 (-3.628)***
<i>SRI_{i,t-1}</i>	-0.036 (-0.775)	-0.036 (-0.773)	-0.037 (-0.785)
<i>l_age_{i,t-1}</i>	-0.003 (-0.332)	-0.003 (-0.344)	-0.003 (-0.340)
<i>l_size_{i,t-1}</i>	-0.011 (-2.211)**	-0.011 (-2.197)**	-0.011 (-2.203)**
<i>l_12b1_{i,t-1}</i>	-6.698 (-1.693)*	-6.729 (-1.702)*	-6.721 (-1.700)*
<i>l_exp_ratio_{i,t-1}</i>	-4.597 (-0.868)	-4.600 (-0.868)	-4.591 (-0.866)
<i>Dload_fees_{i,t-1}</i>	0.023 (1.386)	0.023 (1.392)	0.023 (1.399)
<i>l_family_size_{i,t-1}</i>	0.011 (3.440)***	0.011 (3.431)***	0.011 (3.439)***
<i>Constant</i>	0.863 (3.472)***	0.867 (3.488)***	0.864 (3.484)***
<i>Industry exposures</i>	YES	YES	YES
<i>Style FE</i>	YES	YES	YES
<i>Year*month FE</i>	YES	YES	YES
Observations	50,649	50,649	50,649
R-squared	0.088	0.088	0.088

We perform pooled cross-section regressions, with monthly Carhart (1997) risk-adjusted fund returns from rolling 24 month regressions as dependent variable and as independent variables in our complete models: one of the funds' style adjusted social performance scores (*FundCONCERNS* or *FundSTRENGTHS*), a dummy for explicit SRI funds (*SRI*), the natural logarithm of the age of the oldest share class of the mutual fund (*l_age_{i,t-1}*), *l_size_{i,t-1}* (the natural logarithm of the total net assets (TNA) of the fund), *l_family_size_{i,t-1}* (the natural logarithm of accumulated TNAs of funds that belong to the same fund family), the R-squared from the four-factor model over the past 24 monthly returns (*R2Carhart_{i,t-1}*), a dummy for load fees, (*Dload_fees*), the natural logarithm of 12b1 fees, (*l_12b1_{i,t-1}*) and that of other expenses (*l_exp_ratio_{i,t-1}*), past-month fund flow (*l_flow_{i,t-1}*) inferred from total net assets as in Sirri and Tufano (1998), year-month fixed effects, and style fixed effects derived from funds' rolling 24 month four-factor betas. *T* statistics derived from two-way clustered standard errors are presented in *round* brackets and derived from Newey-West corrected standard errors with 24 lags in *squared* brackets. Coefficients are multiplied by 100 for expositional convenience. *, **, and *** represent significance levels of 10%, 5%, and 1%, respectively.

Figure 1 Histograms of funds' portfolio weights in socially sensitive stocks

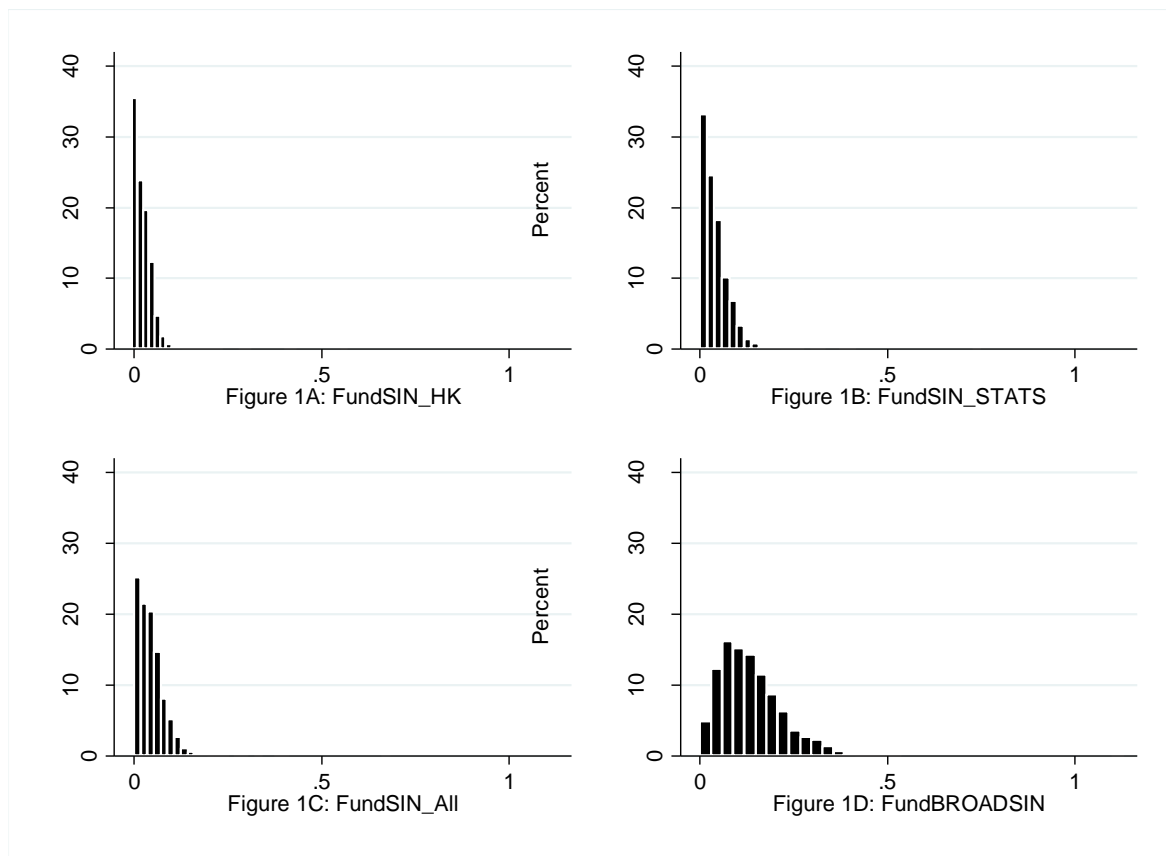
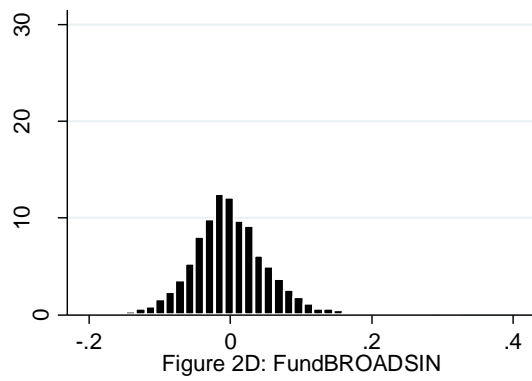
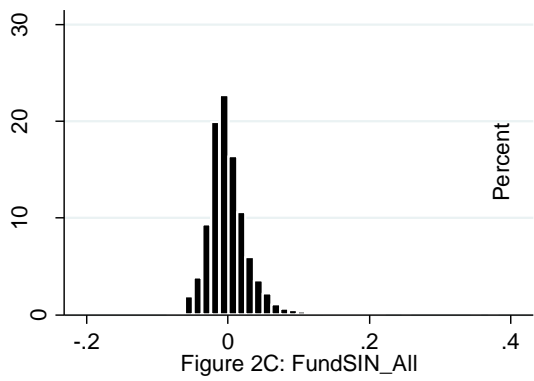
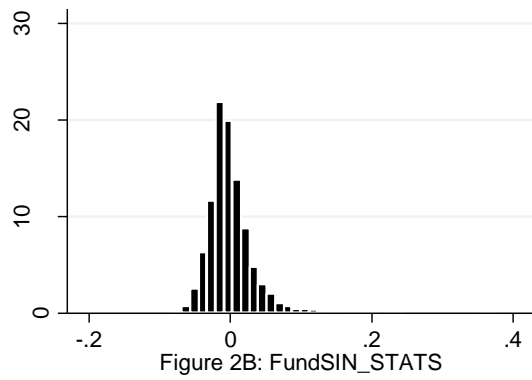
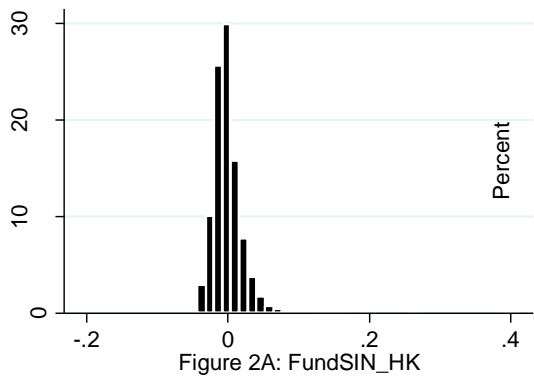


Figure 2. Histograms of funds' style-adjusted exposures to socially sensitive stocks



Note: extreme exposures of the Vice Fund are omitted from histograms