

Comparing the Socially Responsible US Equity Mutual Funds with Conventional Mutual Funds in Different Economic Regimes

Abstract

Using the survivorship bias-free US mutual fund data obtained from the Center for Research in Security Prices (CRSP), we compare performance of 235 socially responsible US equity mutual funds with a matching sample for the period of March 1967 to December 2014. In our comparison, we assume funds' returns are generated in unobservable market regimes that are characterized by a first-order k-state Markov chain. Applying CAPM, Fama and French (1993) 3-factor model, Carhart (1997) 4-factor model, and Fama-French 5-factor model, we compare abnormal return of these mutual funds, with a matching sample. Our results show that, irrespective of the model we use, in most cases, both the socially responsible mutual funds and their matching sample underperform their benchmarks but the level of underperformance is much smaller for the socially responsible funds. Our results are partially consistent with the finding of Nofsinger and Varma (2014) who report that, for the period 2000-2011, SR mutual funds out perform their matching sample during the period of market crisis but contradicts their founding that SR mutual funds underperform their matches in non-crisis period. However, we use ALL bull and bear markets (not just crisis and non-crisis) and different technique to identify these bear and bulls. Also, we test for robustness of our results by using three different matching processes.

I: Introduction:

Many incidences of well publicized high-profile corruption allegations in the last couple of decades, has brought a heightened level of public awareness and their attention to the way businesses conduct their operations. The public awareness also includes academic special interest in the topics of corporate social responsibility (CSR), Environmental, Social and Governance (ESG), and the issue of socially responsible investing.

Debate about the purpose of business organizations and responsibility of their managers goes back at least to 1970s when many followers of Milton Friedman (1970) were questioning why at all managers should deploy corporate resources towards social goals. Many of these economists were also swayed by somewhat one-dimensional application of agency theory based on the work of Michael Jensen (Jensen, 2005; Jensen & Meckling, 1976 & 2005).

On the other hand, an opposing view, presented by several scholars, maintains that corporations are responsible to all people and organizations that are affected by their activities, i.e. the firm's "stakeholders" (Edward Freeman, 1984) and that "firms are institutions created to serve human needs" (John Roberts, 2004). These scholars argue that the restrictive set of assumptions that are required for shareholders' wealth maximization to benefit the entire society do not hold in "the real world." This makes it necessary that "all relevant interests are recognized and taken into account." (John Roberts, 2004).

In addition to these normative positions, in order to positively examine the financial effect of allocating corporate resources to social goals, other scholars attempted to explore the link between corporate social and financial performances. Early researchers in that group published their work in the strategic management and business ethics journals (Waddock and Graves, 1997; Roman et al, 1999; Margolis & Walsh, 2001; Orlitzky & Benjamin, 2001).

The controversy about the link between social and financial scores of companies incentivised scholars in the fields of economics and finance to join the debate (see, for example, Barnea & Rubin, 2010; Statman, 2005; Goss & Roberts, 2011; Kempf & Osthoff, 2007; Huppé, 2011; Kotchen & Moon, 2011; Servaes & Tamayo, 2013; Statman, 2005; Goss & Roberts 2006;

Milevsky et al 2006). Most these research work report a positive link between social and financial performance of the firm. However, some believe that there is a limit to this positive link. For example, Barnia and Rubin (2010) report that the link between CSR expenditures and the firm value is non-linear with a maximum point, i.e., it is positive at low levels of CSR expenditures, and negative beyond a certain level. Goss and Roberts (2011) reach similar conclusion from a different angle. They report that firms with none or a very low level of CSR activities experience a higher cost of borrowing (by 16 basis points) but beyond certain level, CSR activities do not reduce cost of borrowing.

While on balance these research studies provide evidence in support of positive link between social and financial performance, some still claim that the link remain indefinable, or that an enhanced social performance is the by-product of a good financial performance not the other way around. However, Fatemi, Fooladi, & Wheeler (2009) provide evidence that market responds positively to CSR and develop a model to show how imposing the “social responsibility” constraint could result in higher profits for the firm. They test their model by comparing characteristics of the firms included in Domini 400 index with a matching sample for the 1990-2005 period. They report that, while the return and market risk of the two portfolios are not significantly different, idiosyncratic risk of the firms included in Domini 400 is significantly less than that of the matching sample. In another study, Fatemi, Fooladi, & Tehranian (2015) argue that the lower unique risk of the socially responsible firms reported in Fatemi et.al (2009) is attributed to the phenomenon that these firms, by and large, have more loyal employees, more loyal customers, lower chance for facing law suits, and thus a higher chance to survive longer. They develop a model to show that firms with higher chance to survive have higher share value.

It should be noted that higher profitability can result in higher valuation but it does not necessarily translate to a consistently higher rate of return for investors. Fatemi, Fooladi, & Wheeler (2009) also test market’s reaction to the firms that are deleted from or added to the index due to their social performance. They report that firms that are added to the Domini Index, experience a positive abnormal return and firms that are deleted from the index experience a

negative abnormal return¹. This one time jump in valuation (and hence the return) is, of course, different from having a consistently higher return for portfolio of SR firms. Although many researchers report a higher (risk-adjusted) return for socially responsible firms, the research on this field is still considered to be inconclusive.

Part of the research in economic benefit of social responsibility is done through studying mutual funds. Like studies at the firm level, results of studies on mutual funds are mixed. For example, Hong and Kacperczyk (2009) report that institutional investors such as pension funds, which abstain from investing on “sin” stocks (stocks of companies that produce alcohol, tobacco, and gambling) create a neglected effect that enhances expected return of these stocks and, in the process, deprive themselves from the higher risk-adjusted return these stocks provide. Similarly, Fabozzi, Ma, and Oliphant (2008) document that portfolio of “sin” stocks have a higher risk-adjusted return than the market in general. The premium on portfolio of “sin” stocks is also confirmed by Julie Salaber (2013) who attributes this premium to the religion preference of investors at a country level. She reports the prevalence of the premium in Protestant countries but does not find any evidence of such premium in Catholic countries. These reports of superior performance for portfolios of “socially controversial” stocks could be considered as an evidence for underperformance of SRI funds that typically exclude these stocks.

However, a large body of research work provide evidence in support of the idea that SRI portfolios over-perform conventional portfolios or, at the minimum, they do not underperform them. Statman and Glushkov (2009) report a return advantage in “tilting” portfolios toward companies that have higher social scores. However, they also report that the disadvantage of abstaining from “sin” stocks offsets that benefit. Applying Carhart (1997) multifactor model to a data base of ethical funds in the US, UK, and Germany, Bauer, Koedijk, and Otten (2005) find no significant differences between risk-adjusted return of these funds and conventional funds during the 1990-2001 period, after controlling for investment styles. Similar conclusion is made by Leitw and Cortez (2014) who studied SRI funds domiciled in selected countries in European

¹ The three-day cumulative abnormal return surrounding the announcement (-1, 0, +1) for firms that are added to (deleted from) index is reported to be 0.67% (-1.22%).

zone. They also find no significant difference between performances of these funds and their conventional, matches during the Jan. 2000- Dec. 2008 period.

Derwall et.al. (2011) examine financial performances of two types of portfolios for the 1992-2008 period; portfolios comprising of shunned (sin) stocks and portfolios that comprise stocks with high score on employment relations (as a surrogate for SRI funds). They report a consistent and statistically significant positive abnormal return during the study period for the former portfolio and an abnormal return that decreases substantially over time for the latter portfolio. While this could provide an evidence in favor of the “sin” portfolios, it makes the point that SRI portfolios do not underperform conventional funds. Derwall et.al. (2011) maintain that often in practice SRI are formed by both exclusionary screens, which typically result in higher return for portfolio of shunned stocks (SRIs) as compared to conventional funds, and positive screens of social scores, which are reported to create positive abnormal return for SRI compared to conventional funds. They hypothesize that the two effects could cancel out leaving “no net-effect” and that is why studies on SRI mutual funds “largely agree that SRI funds and conventional funds earn similar risk-adjusted returns.”

Borgers, Derwall, Koedijk, and Horst (2015) investigate whether the responsiveness in social issues that is reported in previous studies (such as Hong and Kacperczyk, 2009 and Hood et.al., 2014) in segments of individual and institutional investors also prevails in the mutual fund industry. In other words, they investigate whether these social considerations also influence mutual funds’ compositions. They report that, in addition to SRI funds, depending on their local political or religious factors, various other mutual funds also carry little or no socially controversial stocks. Also, they report that funds with higher percentage of institutional investors hold less percentage of “socially sensitive” stocks.

Borgers et.al. (2015) also investigate whether or not these social dimensions in mutual funds’ composition affect their performance. They find a statistically significant positive relation between mutual funds’ performance (measured by their risk-adjusted return) and their weight in “sin” stocks, which loses significance as they broaden their definition of socially controversial stocks. Interestingly, they report no significant spread between the risk-adjusted returns of portfolios with the highest and lowest sin scores.

Many studies on CSR and, particularly on performance effect of social considerations for mutual funds do not distinguish between good and bad economic times. One exception is the work of Nofsinger and Varma (2014) who use a database of US domestic equity SRI mutual funds for the 2000-2011 period to separately investigate performance of these funds during the crisis and non-crisis portion of that period. They report that socially responsible mutual funds outperform their matching sample of conventional funds during the crisis period and underperform the conventional funds during the non-crisis period.

In this paper, we investigate the performance of socially responsible mutual funds as compared to their matched conventional funds under different economic regimes. Unlike Nofsinger and Varma (2014) who investigate just the recent financial crisis, we investigate all bear and bull markets **since 1967**. As we explain below, our approach is to apply regime switching process to capture the probabilities of abrupt changes in macroeconomic variables and the way these fundamentals reflect in asset prices. To check the robustness of our approach, we also repeat our tests, using the bear and bull definition of National Bureau of Economic Research (NBER).

II: Data

The information on return and other characteristics of mutual funds are acquired from a survivorship bias-free monthly data on US Mutual Funds and FTE, which we obtained from Center for Research in Security Prices (CRSP) for the period of January 1962 to December 2014. We also obtained a list of 240 US equity mutual funds in the SRI category from Nofsinger and Varma (2014).² We identified 56860 funds in the CRSP database, including 235 of our list of 240 SRI Mutual funds. We could not find complete information for 5 of the funds in our list.

The historical distribution of our SRI funds and their growth are fairly similar to what was reported in Nofsinger and Varma (2014), with a minor difference due to the 5 funds for which we could not find complete information. However, as shown in Table 1, the number of SRI funds and the amount of assets under their managements grow until 2011. From 2011 to 2014, although the total asset under the SRI fund management in our dataset grew at 22.9% per annum, from \$26.7 trillion to \$49.5 trillion, their number declined from 179 to 159³.

² We are grateful to professor Abhishek Varma for his generosity for sending us the list of socially responsible

³ See Nofsinger and Varma (2014) for more detailed description of these funds and their categories.

Place Table 1 around here

As in many studies on the performance of SRI funds or group of CSR companies, we compare performance of our 235 SRI funds with a matching sample of conventional funds.⁴ Following Nofsinger and Varma (2014), on the first date that a SRI fund appears in our dataset, we pick three matches from the list of conventional funds. Our criteria for identifying closest match is to pick conventional funds that are of the same type (open versus closed), have the same objectives and classification codes, and on their last year in our database, are managing the closest total net asset value to our SRI funds. To make sure our results are not the artifact of our matching techniques, we also use two other matching criteria. First, we find the three matches (for each SRI fund in our database) that satisfy all the above criteria and have closest total net asset value to that of the SRI's last year in our database. secondly, for each SRI fund in our database, we also identify three match funds that commence on the same year that our SRI funds begin and have the safe life length (end within 1-2 years of the end dates of our SRI funds). As we explain in our discussion of test results, the outcomes are strikingly similar.

III: Models and methodology

a. Regime Switching Framework

Similar to Nofsinger and Varma (2014) we compare performance of SRI funds with that of the matching portfolios using their abnormal returns obtained from different factor models. For our asset pricing models, we use CAPM, Fama-French (1993) 3-factor model, Carhart (1997) 4-factor models, and Fama-French 5-factor model. However, the difference in our methodology is that in our models, we assume fund returns depend on economic regimes that are characterized by a hidden Markove Chain.

As reported in several studies (e.g., Hamilton (2005) many macroeconomic variables have tendency to change behavior in response to changes in the economic environments. When the changes in economic environment are abrupt, such as sudden change in political systems, business cycles, government policies and so forth, changes in macroeconomic variables could also be abrupt. Financial variables are not insulated from this behaviour and, as such, financial

⁴ For examples of matching criteria, see Nofsinger and Varma (2014), Fatemi, Fooladi, and Wheeler (2009), Renneboo et al (2008), Bollen (2007), and Bauer et al. (2005).

markets are characterized by regimes that depend on the changing patterns of economic indicators. It makes sense to have theoretical foundation that considers how these abrupt changes in fundamentals reflect on asset prices. Regime switching process serves that purpose. It is a process that opts to characterize the nature of abrupt changes by considering the probability of transition from one regime at time $t - 1$ to another at time t .

Considering these probabilities is important because the change from one regime to another is not a deterministic event that can be forecasted with certainty. Stock markets may be positioned in one regime for some uncertain length of time before transition to another regime. Ignoring probabilities of such transitions requires that either we make assumption about the exact time when the structural shifts would take place or that we average relationships that govern our data across regimes. Either way, we may end up with inaccurate forecasts and thus suboptimal strategies.

Instead, we may design a general model that encompasses all regimes with some random elements. As suggested by Hamilton (2005), a “complete description of the probability law governing the observed data would then require a probabilistic model of what caused the change” from one regime to another. One such model is:

$$F_t = \alpha_{M_t} + \beta_{M_t} F_{t-1} + \gamma_{M_t} \varepsilon_t \quad (1)$$

Where $F_t = (F_{t1}, F_{t2}, \dots, F_{tj})$ denote a set of macroeconomics indicators that follow a vector autoregressive process (VAR) and the parameters α_{M_t} , β_{M_t} , and γ_{M_t} are depended on the regimes.

In general, we assume there are M discrete regimes, which follow a first-order K -state stationary Markov chain with the following probability transition matrix:

$$P = \begin{bmatrix} p_{11} & p_{12} & \dots & p_{1K} \\ p_{21} & p_{22} & \dots & p_{2K} \\ \dots & \dots & \dots & \dots \\ p_{K1} & p_{K2} & \dots & p_{KK} \end{bmatrix}$$

where $Pr(M_t=j|M_{t-1}=i, M_{t-2} = k, \dots) = Pr(M_t = j|M_{t-1} = i) = p_{ij}$ is the conditional probability of transferring from regime i at time $t-1$ to regime j at time t . The Markov chain is unobservable and embedded in the observed economic indicators. The joint distribution of these indicators depends on the current observations as well as regime-switching model parameters. Because regimes are not observable, their probability distributions need to be dynamically updated as new data arrives.

In this paper, we identify the following seven macroeconomic indicators that drive the dynamics of the market regimes; the S&P500 Price Index (STX), the U.S. Credit Spread (UCS), the Treasury Yield Spread (TYS), the Consumer Confidence Index (CCI), the Leading Economic Index (LEI), the Consumer Price Index (CPI) and the U.S. Industrial Production Index (MIP). We used the period March 1967 to December 2014 for these macroeconomic indicators to match the information we took from “Kenneth R. French Data Library.” We also use “Bayesian Information Criterion” and find out that the optimum number of regimes for our data is two regimes with the following transition Matrix:

$$P = \begin{bmatrix} 0.9173 & 0.0827 \\ 0.0343 & 0.9657 \end{bmatrix}$$

Here regimes one and two are bear and bull regimes, respectively. The probabilities in this transition matrix show that the market is more likely (with 8.27% chance) to transfer from the bear market to Bull market than the other way around (with 3.43% chance). Also, with probabilities of 91.73% and 96.57%, both bear and bull markets are highly persistent.

b. Asset Pricing Models under Regime Switching

as mentioned earlier, we employ four different factor models, CAPM, Fama-French three-factor four-factor (Carhart) and five-factor models, to measure abnormal returns. In general, our asset pricing framework could be presented as:

$$R_{it} - R_{ft} = \alpha_{M_t} + \beta_{M_t} f_{t-1} + \sigma_{M_t} \varepsilon_t \quad (2)$$

Where R_{it} and R_{ft} are monthly return on funds and risk-free security, respectively, f_{t-1} is the vector of risk factors, and $\varepsilon_t \sim N(0, I)$. The model parameters $(\alpha_{M_t}, \beta_{M_t}, \sigma_{M_t})$ are regime-

dependent. As explained earlier, in general, there are M distinct regimes, following first order Markov Chain, with an initial regime distribution and a constant transition matrix indicating the conditional probability of transferring from regime i at time $t-1$ to regime j at time t . In our case, $M=2$. So, we measure the regime-dependant parameters for our four models as follows:

For CAPM:

$$R_{it} - R_{ft} = \alpha_{M_t} + \beta_{M_t} (R_{mt} - R_{ft}) + \varepsilon_t \quad (3)$$

Where $(R_{mt} - R_{ft})$ is the market risk premium and other variables are as defined above.

For 3-factor Fama-French:

$$R_{it} - R_{ft} = \alpha_{M_t} + \beta_{1,M_t} (R_{mt} - R_{ft}) + \beta_{2,M_t} SMB_{t-1} + \beta_{3,M_t} HML_{t-1} + \varepsilon_t \quad (4)$$

Where SMB and HML are size and valuation factors, retrieved from “Kenneth R. French Data Library” and other parameters are as defined earlier.

For 4-factor Fama-French:

$$R_{it} - R_{ft} = \alpha_{M_t} + \beta_{1,M_t} (R_{mt} - R_{ft}) + \beta_{2,M_t} SMB_{t-1} + \beta_{3,M_t} HML_{t-1} + \beta_{4,M_t} MOM_{t-1} + \varepsilon_t \quad (5)$$

Where MOM denotes momentum factor (retrieved from “Kenneth R. French Data Library”) and the rest of parameters are as defined earlier.

And for 5-factor Fama-French:

$$R_{it} - R_{ft} = \alpha_{M_t} + \beta_{1,M_t} (R_{mt} - R_{ft}) + \beta_{2,M_t} SMB_{t-1} + \beta_{3,M_t} HML_{t-1} + \beta_{4,M_t} RMW_{t-1} + \beta_{5,M_t} CMA_{t-1} + \varepsilon_t \quad (6)$$

Where RMW denotes “robust minus weak” and is the average return on the two robust operating profitability portfolios minus the average return on the two weak operating profitability portfolios.⁵ CMA , denotes “conservative minus aggressive” and is the average return on two

⁵ A robust operating profitability portfolio consists of stocks that create profit irrespective of the market condition, and a weak operating profitability portfolio consists of stocks with weak ability in creating profit (French, 2017).

conservative investment portfolios minus the average return on two aggressive investment portfolios (French, 2017).⁶

IV: Fund Performance in different regimes:

As mentioned earlier, for our first set of empirical studies, on the first date that a SRI fund appears in our database, we pick three matches from the list of conventional funds that have the same type, the same objectives and classification codes, and on their last year in our database, are managing the closest amount of assets to our SRI funds. We then form two sets of portfolios from these SRI funds; an equally weighted portfolio and a total-net-asset-value-weighted portfolio, and measure their average returns in bull and bear markets (determined based on our regime switching probabilistic model) separately. Next, we form the same two sets of portfolios from each set of matched Funds and measure their total return in bull and bear markets as well.

As indicated in Panel (a) of Table 2, for this category of matching, the results are qualitatively similar. In bear markets, an equally weighted portfolio of SRI funds provides slightly less monthly return than an equally weighted portfolio of best matched funds (-0.198% per month vs -0.160% per month) and in bull markets provides slightly higher return (0.804% per month vs -0.732% per month). When we form value weighted portfolios based on the amount that these funds manage (total net asset value) the results are similar, in bear and bull markets SRI funds provide slightly lower return (-0.201% per month vs -0.133% per month in bear markets and 0.98% per month vs 1.0% per month in bull markets).

Insert Table 2 around here

However, comparing average total returns without considering risk would not provide a clear picture of funds' performances. As mentioned earlier, we also measure performance of average SRI fund as compared with matched conventional funds by calculating their risk adjusted abnormal returns. To get the abnormal returns, similar to Nofsinger and Varma (2014), we used CAPM, Fama-French (1993) 3-factor model, and Carhart (1997) 4-factor model. Furthermore, we also used Fama-French 5-factor model. Our approach is different from previous studies in that we obtain these abnormal returns, separately in bear and bull markets that are determined by the probabilistic regime switching Markov Chain approach.

Panel (a) in Table 3 illustrates our calculation of abnormal return based on CAPM. The results show that an equally weighted portfolio of SRI funds outperforms its corresponding conventional funds (for best match as well as the average of 3 matches) both in bear and bull markets. All differences in bear markets are statistically significant at 1% confidence level and the difference with the best matching portfolio is statistically significant at the 5% confidence level.

⁶ A conservative portfolio mainly consists of lower risk securities such as bonds and cash, while an aggressive portfolio consists of higher risk securities such as stocks (French, 2017).

When we form value-weighted portfolio of SRI funds, they also outperform their corresponding conventional funds both at bear and bull markets. However, while the difference between abnormal returns of SRI funds and their corresponding conventional funds are significant in bear markets (7.39% positive return for SRI versus 4.64 percent negative return for the best matched conventional portfolio), the outperformance of SRI funds in bull market is not striking.

Next we use Fama-French 3-factor model (Equation 4) to obtain abnormal returns. The results are shown in Table 4. An equally-weighted portfolio of SRI funds outperforms its corresponding conventional funds both in bear and bull markets and p-values for differences are less than 2%. When we form value-weighted portfolios based on funds' total net asset values, SRI funds significantly outperform their corresponding conventional funds in bull markets and slightly underperform the best matching fund in bear markets, but the underperformance is not statistically significant.

Next, we obtain abnormal returns based on 4-factor Fama-French (Carhart) model. As shown in Tale 5, based on this 4-factor asset pricing model, both equally-weighted and value-weighted SRI funds outperform their matched funds (best match as well as average of 3 matches of conventional funds) in both bear and bull markets. The differences are statistically significant at 6% level in the bear markets but not significant in the bull markets.

Finally, we obtain abnormal returns based on 5-factor Fama-French model (Equation 6). As illustrated in Table 6, an equally-weighted portfolio of SRI funds significantly outperforms its corresponding conventional funds both in bear and bull markets and p-values for differences are less than 1%. When we form value-weighted portfolios based on funds' total net asset values, SRI funds outperform their corresponding conventional funds in bull markets and slightly underperform the best matching fund in bear markets, but the differences not statistically significant.

From what observe so far, consistent with the results of earlier studies, both SRI and conventional mutual funds often underperform their benchmark. However, SRI funds consistently outperform their matched conventional funds both in bear and bull markets when we form equally-weighted portfolio of these funds. They also almost always outperform their matched portfolio of conventional funds when we compare them by forming TNA value-weighted portfolios of these funds. In order to make sure that the results obtained by our tests are not artifacts of our matching process, we also obtained portfolios of conventional funds based on two sets of other matching criteria as explained below.

Our next set of matched conventional funds is found based on the same criteria as before (type, objective and classification codes, and total net asset value), except that we compare TNA based on the last year of the shorter life fund, regardless of whether this shorter life fund is SRI or conventional fund. Again, we compare performance of SRI funds with that of the matching portfolios by comparing their abnormal returns obtained from the same asset pricing models as

before, CAPM, Fama and French (1993) 3-factor model, Carhart (1997) 4-factor model, and Fama and French 5-factor model.

The results are tabulated in Tables 7 to 11 and are essentially the same as our results for the first set of matches. Total returns of SRI funds are similar to the returns of match funds and the difference between the abnormal return of SRI funds and match fund are also similar to their differences for the first set of matching, with perhaps minor differences. When we use CAPM to obtain abnormal return, both equally-weighted and value-weighted portfolios of SRI funds perform better than their conventional matches in bear markets and perform similarly in bull market.

Using 3-factor, and 4-factor models, as shown in Tables 9 and 10, equally-weighted SRI funds perform the same as conventional funds in bull markets and do better (with 3-factor) or the same (with 4 factor) in bear markets. Value weighted SRI funds, do better than conventional funds in bull markets and essentially the same (4-factor) or slightly worse (3-factor) in bear markets. However, none of these differences are statistically significant. Using 5-factor model (Table 11), we observe that SRI funds do better (value-weighted portfolios) or the same (equally-weighted portfolios) in bull markets and underperform their best match in bear markets.

Next, we find our matched portfolios using the same criteria, except this time we add a condition that the matched funds must have the same life length as the SRI funds, commencing at the same year of SRI commencement and terminating at the same year as SRI or at most within 1-2 years. Adding this new condition does not materially change the results. Using one factor model (Table 13), we observe that a value-weighted Portfolio of SRI funds performs substantially better than their corresponding conventional funds in both bear and bull markets. An equally-weighted SRI funds does performs the same in bull markets and slightly worse in bear market but the difference is not significant. Using 3 and 4-factor models (Tables 14 and 15), we find that value weighted SRI funds perform substantially better than conventional funds in both bear and bull markets and equally weighted portfolio of SRI funds perform slightly better in bull markets and essentially the same in bear markets. Using 5-factor model (Table 16), we observe again that value weighted SRI funds perform substantially better than conventional funds in both bear and bull markets while the equally-weighted SRI funds do slightly better (in bear markets) or the same (bull markets).

Robust Test of our Regime Switching Framework

To assure that our probabilistic approach captures bear and bull regimes appropriately, we also studied expansion and contraction regimes identified by the National Bureau of Economic Research (NBER). Our model's prediction of bear and bull regimes is strikingly close to those identified by NBER; over 94% overlap for the period of March 1967 to December 2014.

We also calculate gross and risk adjusted abnormal returns on the bear and bull markets as identified by the NBER and compare the results with what we obtain using our regime switching

approach. The actual average returns using various matching approaches are reported in Panel (b) of Tables 2, 7, and 12, and are essentially similar to those actual returns using regime switching framework.

As in earlier part, for each SRI fund we find matches with three different approaches and obtain abnormal return based on 1-factor, 3-factor, 4-factor, and 5-factor models. Results, using one-factor model are reported in Panel (b) of tables 3, 8, and 13. In almost all cases, SRI funds either performs better or similar to the conventional funds and the differences are mostly statistically significant.

Using our first set of matches and applying the 3-factor model of asset pricing, we find that SRI portfolios slightly outperform their conventional matches in bull markets and slightly underperform their matches in bear markets. None of these differences are statistically significant (Table 17). Applying 4-factor model, we observe that SRI funds outperform conventional funds at all times except when we compare them based on equally weighted portfolios, when they perform essentially the same in bear regimes. When we apply 5-factor asset pricing model, equally-weighted portfolios of SRI funds significantly outperform their conventional matches in both bear and bull markets and value weighted portfolios of SRI funds perform better in bull markets and the same in bear markets.

Using our 2nd set of matches, based on the 3-factor model, the risk adjusted abnormal return of equally-weighted SRI funds are basically the same as conventional funds. Value-weighted portfolio of SRI funds outperform their conventional funds in bull regimes and underperform them in bear regimes. None of these differences are statistically significant (Table 20). Based on the 4-factor model, value-weighted SRI portfolios substantially outperform their corresponding conventional funds, and equally weighted SRI funds have essentially similar performance (Table 21). When we use 5-factor model, SRI portfolios significantly outperform their conventional matches in all cases except for the equally weighted portfolios in bull regimes where SRI portfolio does slightly worse but the difference is not statistically significant (Table 22). Finally, when we find matches based on our third approach, using both 3-factor and 4-factor models result in substantially better performance for value-weighted portfolio of SRI funds relative to that of conventional funds in both bear and bull markets and similar performances in bull markets when we form equally-weighted portfolios. In bear markets equally weighted SRI portfolios underperform their conventional matches (Tables 23 and 24). When we use 5-factor model, SRI portfolios significantly outperform their conventional matches in all cases except for the equally weighted portfolios in bull regimes where SRI portfolio does slightly worse than conventional funds (Table 25).

Summary and Conclusion:

Although normative debate about the purpose of business organizations and responsibility of their managers goes back to the last century, positive examination of the financial effect of allocating corporate resources to social goals is relatively recent. Since the scholars in the fields of economics and finance joined the debate majority of researches report a positive link between social and financial performance of the firm. However, while these studies show positive correlations, only a few report causal relationship. Moreover, some show a limit to this positive link and some still claim that the link remain indefinable, or that an enhanced social performance is the by-product of a good financial performance not the other way around.

It should be noted that higher profitability can result in higher valuation but it does not necessarily translate to a consistently higher rate of return for investors. Despite studies such as Fatemi, Fooladi, & Wheeler (2009) who report a positive abnormal return for firms that are added to the Domini Index and negative abnormal return for those that are deleted from the index, this reported one time jump in valuation and return is different from having a consistently higher return for portfolio of SR firms.

Similar to studies at the firm level, results of studies on mutual funds are also mixed.

While a large number of studies provide evidence in support of the idea that SRI portfolios overperform conventional funds or, at the minimum, they do not underperform, several studies report opposite results. With the exception of a few researches such as Nofsinger and Varma (2014) who investigate performance of the US domestic equity SRI mutual funds separately during the crisis and non-crisis portion of the 2000-2011 period, many of these studies do not distinguish between good and bad economic times.

In this paper, we investigate the performance of socially responsible mutual funds relative to their matched conventional funds under different economic regimes. Unlike Nofsinger and Varma (2014) who investigated just the recent financial crisis, we investigate all bear and bull markets since 1967. Furthermore, our approach is to apply regime-switching process to capture the probabilities of abrupt changes in macroeconomic variables and the way these fundamentals reflect in asset prices.

We apply three different matching processes and for each process, we obtain three matches for each of our 235 SRI funds and compare their performances. For this comparison, we use 1, 3, 4, and 5-factor asset pricing models to obtain risk adjusted abnormal return for the SRI and their matches. The results vary depending on the matching process but, by and large, they provide strong evidence in support of the idea that socially responsible investing pays off in most cases, and at the minimum, SRI funds do not underperform their conventional matches.

We also, test the accuracy of our probabilistic regime-switching framework against the expansion and contraction periods, identified by the National Bureau of Economic Research (NBER), and find that there are over 94% overlap between our periods of bear and bull markets and their during the 1967-2014 period. We believe, our regime switching approach is more appropriate than using NBER expansion and contractions for two reasons. First, while NBER statistics report boom and bust of the past, our approach is capable of offering probabilities for switching from one economic regime to another in the future. Secondly, where as NBER announces a bull or bear economic state only after the economy has been in that state for six months, our approach identifies regimes in every month.

When we redo our test based on the bull and bear markets identified by NBER, in most cases, SRI funds either performs significantly better or similar to the conventional funds. In a few occasions where the SRI funds slightly underperform conventional funds, the differences are not statistically significant.

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Table 1: SRI funds' history

	Full period	1967.3	2000.1	2006.1	2010.1	2011.1	2014.1
# Fund	235	1	71	106	176	179	159
TNA		NA	7158.1	23139	22420	26661	49454
Fund type(#of funds)							
Non-indexed	185	0	59	80	140	147	128
index-based	19	1	7	8	11	11	11
ETF Pure index based	12	0	0	2	11	7	6
Non-ETF Pure index based	16	0	2	13	11	11	11
Index Fund enhanced	3	0	3	3	3	3	3

Table 2: Average actual returns of SRI funds and conventional funds:

Matches made based on the TNA on each fund's last year

Panel a: Regime Switching				
Portfolio type	Equally weighted		TNA Value weighted	
Market condition	Bear market	Bull market	Bear market	Bull market
SRI	-0.00198	0.00804	-0.00201	0.00984
Best Match	-0.00160	0.00732	-0.00133	0.01015
Average 3 Matches	-0.00159	0.00769	-0.00147	0.00981
Panel b: NBER				
Portfolio type	Equally weighted		TNA Value weighted	
Market condition	Bear market	Bull market	Bear market	Bull market
SRI	-0.00231	0.00838	-0.00225	0.01011
Best Match	-0.00199	0.00775	-0.00164	0.01062
Average 3 Matches	-0.00197	0.00807	-0.00174	0.01016

Table 3: Average abnormal return of SRI and conventional funds calculated by CAPM: Matches made based on the TNA on each fund's last year.

Panel a: Regime switching	Equally weighted				Value weighted			
	Bear market		Bull market		Bear market		Bull market	
	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta
SRI	-0.0646	1.0177	-0.1489	1.0217	0.0739	1.0303	-0.0816	1.0278
Best Match	-0.2901	1.0224	-0.2262	1.0303	-0.0464	1.0204	-0.0903	1.0167
Average 3 Matches	-0.2139	1.0318	-0.1811	1.0243	-0.0207	1.0155	-0.0864	1.0052
Panel b: NBER	Equally weighted				Value weighted			
	Bear market		Bull market		Bear market		Bull market	
	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta
SRI	0.0842	0.8915	-0.1609	1.0091	0.1895	0.9940	-0.0840	1.0255
Best Match	-0.0287	0.8605	-0.2307	1.0288	0.0782	0.8790	-0.0885	1.0163
Average 3 Matches	-0.0251	0.8432	-0.1834	1.0225	0.0915	0.9030	-0.0878	1.0043

Table 4: Average abnormal return of SRI and conventional funds calculated by Fama-French 3-factor Model:

Matches made based on the TNA on each fund's last year

Panel a: Value Weighted

Bear Regime				
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3
SRI	-0.0320	1.0173	0.1981	-0.0785
Best Matching	-0.0248	1.0163	0.1035	-0.1321
Average 3 Matches	-0.0321	1.0097	0.1043	-0.0952
Bull Regime				
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3
SRI	-0.0585	1.0043	0.0997	-0.0358
Best Matching	-0.0942	0.9917	0.0949	-0.0224
Average 3 Matches	-0.0877	0.9840	0.0914	0.0038

Panel b: Equally Weighted

Bear Regime				
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3
SRI	-0.0822	1.0014	0.2166	-0.1237
Best Matching	-0.2325	1.0263	0.1208	-0.0758
Average 3 Matches	-0.1935	1.0214	0.1297	-0.0733
Bull Regime				
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3
SRI	-0.1226	0.9949	0.1382	-0.0026
Best Matching	-0.2049	0.9978	0.1431	0.0375
Average 3 Matches	-0.1534	0.9903	0.1411	0.0358

Table 5: Average abnormal return of SRI and conventional funds calculated by Fama-French 4-factor Model:

Matches made based on the TNA on each fund's last year

Panel a: Value Weighted

Bear Regime					
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4
SRI	-0.0999	1.0059	0.1867	-0.0802	-0.0110
Best Matching	-0.1345	1.0005	0.0877	-0.1499	-0.0207
Average 3 Matches	-0.1310	0.9973	0.0882	-0.1033	-0.0132
Bull Regime					
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4
SRI	-0.0491	1.0011	0.1049	-0.0383	-0.0198
Best Matching	-0.0926	0.9928	0.0953	-0.0241	0.0012
Average 3 Matches	-0.0835	0.9832	0.0922	0.0028	-0.0022

Pane b: Equally Weighted

Bear Regime					
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4
SRI	-0.1796	0.9988	0.1695	-0.1183	0.0022
Best Matching	-0.2753	1.0154	0.1000	-0.0942	-0.0285
Average 3 Matches	-0.2605	1.0098	0.1155	-0.0790	-0.0150
Bull Regime					
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4
SRI	-0.1553	1.0041	0.1379	0.0123	0.0056
Best Matching	-0.1997	0.9998	0.1425	0.0391	0.0070
Average 3 Matches	-0.1493	0.9897	0.1409	0.0355	-0.0002

**Table 6: Average abnormal return of SRI and conventional funds calculated by Fama-French 5-factor Model:
Matches made based on the TNA on each fund's last year**

Panel a: Value Weighted

Bear Regime						
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4	Beta 5
SRI	-0.1320	0.9960	0.2442	-0.0856	0.0228	-0.1470
Best Matching	-0.0943	1.0198	0.1344	-0.1215	0.1046	-0.1330
Average 3 Matches	-0.1388	1.0100	0.1319	-0.0850	0.0841	-0.1363
Bull Regime						
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4	Beta 5
SRI	-0.0514	1.0097	0.1010	-0.0127	0.0052	-0.0787
Best Matching	-0.0875	1.0019	0.0973	-0.0030	0.0072	-0.1041
Average 3 Matches	-0.0789	0.9902	0.0936	0.0240	0.0070	-0.1053

Panel b: Equally Weighted

Bear Regime						
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4	Beta 5
SRI	-0.2407	0.9928	0.2275	-0.1284	0.0288	-0.1369
Best Matching	-0.3436	1.0254	0.1577	-0.0386	0.1288	-0.1830
Average 3 Matches	-0.3342	1.0138	0.1764	-0.0597	0.0889	-0.1543
Bull Regime						
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4	Beta 5
SRI	-0.1150	1.0029	0.1485	0.0085	0.0210	-0.0993
Best Matching	-0.1971	1.0078	0.1371	0.0307	-0.0113	-0.0657
Average 3 Matches	-0.1435	0.9953	0.1367	0.0396	-0.0026	-0.0714

**Table 7: Average actual returns of SRI funds and conventional funds:
Matches made based on the TNA on the last year of shorter life fund**

Panel a: Regime Switching				
Portfolio type	Equally weighted		TNA Value weighted	
Market condition	Bear market	Bull market	Bear market	Bull market
SRI	-0.00198	0.00804	-0.00204	0.00990
Best Match	-0.00160	0.00929	-0.00147	0.01025
Average 3 Matches	-0.00163	0.00926	-0.00145	0.01020
Panel b: NBER				
Portfolio type	Equally weighted		TNA Value weighted	
Market condition	Bear market	Bull market	Bear market	Bull market
SRI	-0.00230	0.00838	-0.00226	0.01012
Best Match	-0.00187	0.00958	-0.00174	0.01062
Average 3 Matches	-0.00194	0.00958	-0.00171	0.01050

Table 8: Average abnormal return of SRI and conventional funds calculated by CAPM: Matches made based on the TNA on the last year of shorter life fund

Panel a: Regime switching	Equally weighted				Value weighted			
	Bear market		Bull market		Bear market		Bull market	
	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta
SRI	-0.0648	1.0175	-0.1496	1.0228	0.0761	1.0308	-0.0815	1.0296
Best Match	-0.1049	1.0348	-0.1410	1.0241	0.0083	0.9999	-0.0753	0.9970
Average 3 Matches	-0.0677	1.0343	-0.1352	1.0111	0.0501	1.0052	-0.0709	0.9899
Panel b: NBER	Equally weighted				Value weighted			
	Bear market		Bull market		Bear market		Bull market	
	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta
SRI	0.0874	0.8896	-0.1615	1.0105	0.1989	0.9936	-0.0850	1.0272
Best Match	0.8903	0.0412	-0.1390	1.0226	0.0083	0.9999	-0.0706	0.9971
Average 3 Matches	0.4816	0.4363	-0.1307	1.0099	0.0501	1.0052	-0.0671	0.9899

Table 9: Average abnormal return of SRI and conventional funds calculated by Fama-French 3-factor Model:

Matches made based on the TNA on the last year of shorter life fund

Panel a: Value Weighted

Bear Regime				
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3
SRI	-0.0340	1.0182	0.2035	-0.0810
Best Matching	0.0096	0.9981	0.1091	-0.1167
Average 3 Matches	0.0100	0.9978	0.1266	-0.0848
Bull Regime				
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3
SRI	-0.0585	1.0053	0.1044	-0.0361
Best Matching	-0.0936	0.9830	0.0814	0.0036
Average 3 Matches	-0.0769	0.9756	0.0783	0.0041

Pane b: Equally Weighted

Bear Regime				
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3
SRI	-0.0838	1.0014	0.2205	-0.1266
Best Matching	-0.1351	1.0373	0.1173	-0.0753
Average 3 Matches	-0.1156	1.0301	0.1332	-0.0987
Bull Regime				
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3
SRI	-0.1231	0.9955	0.1413	-0.0026
Best Matching	-0.1251	0.9804	0.1320	0.0322
Average 3 Matches	-0.1386	0.9902	0.1463	0.0301

Table 10: Average abnormal return of SRI and conventional funds calculated by Fama-French 4-factor Model:

Matches made based on the TNA on the last year of shorter life fund

Panel a: Value Weighted

Bear Regime					
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4
SRI	-0.1021	1.0064	0.1916	-0.0831	-0.0121
Best Matching	-0.0944	0.9836	0.0933	-0.1319	-0.0235
Average 3 Matches	-0.0752	0.9856	0.1111	-0.0969	-0.0184
Bull Regime					
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4
SRI	-0.0493	1.0021	0.1096	-0.0386	-0.0196
Best Matching	-0.0889	0.9832	0.0823	0.0001	-0.0053
Average 3 Matches	-0.0749	0.9761	0.0775	0.0033	0.0020

Pane b: Equally Weighted

Bear Regime					
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4
SRI	-0.1812	0.9990	0.1729	-0.1210	0.0023
Best Matching	-0.1850	1.0139	0.1344	-0.0825	-0.0337
Average 3 Matches	-0.1981	1.0181	0.1252	-0.0994	-0.0138
Bull Regime					
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4
SRI	-0.1564	1.0049	0.1409	0.0125	0.0061
Best Matching	-0.1342	0.9907	0.1474	0.0283	-0.0043
Average 3 Matches	-0.1196	0.9805	0.1328	0.0288	-0.0046

Table 11: SOS 5factor RS

Panel a: Value Weighted

Bear Regime						
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4	Beta 5
SRI	-0.1374	0.9963	0.2510	-0.0878	0.0250	-0.1491
Best Matching	-0.0484	0.9952	0.1346	-0.1048	0.0522	-0.1350
Average 3 Matches	-0.0720	0.9834	0.1519	-0.0676	0.0450	-0.1613
Bull Regime						
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4	Beta 5
SRI	-0.0516	1.0109	0.1059	-0.0135	0.0059	-0.0798
Best Matching	-0.0961	0.9951	0.0854	0.0171	0.0225	-0.0941
Average 3 Matches	-0.0837	0.9861	0.0830	0.0131	0.0257	-0.0786

Panel b: Equally Weighted

Bear Regime						
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4	Beta 5
SRI	-0.2443	0.9924	0.2316	-0.1309	0.0288	-0.1384
Best Matching	-0.1970	1.0160	0.1818	-0.0078	0.1262	-0.2688
Average 3 Matches	-0.2527	0.9966	0.1773	-0.0657	0.0923	-0.1950
Bull Regime						
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4	Beta 5
SRI	-0.1154	1.0037	0.1518	0.0081	0.0211	-0.1002
Best Matching	-0.1283	0.9959	0.1427	0.0488	0.0029	-0.1140
Average 3 Matches	-0.1168	0.9846	0.1325	0.0479	0.0134	-0.1063

**Table 12: Average actual returns of SRI funds and conventional funds:
Matches made by selecting conventional funds that commence at the same year as the SRI funds' commencements and end within 1-2 years from SRI closing. Other criteria are the same and close matches are decided based on the TNA on commencement year.**

Panel a: Regime Switching				
Portfolio type	Equally weighted		TNA Value weighted	
Market condition	Bear market	Bull market	Bear market	Bull market
SRI	-0.0018	0.0083	-0.0015	0.0097
Best Match	-0.0015	0.0083	-0.0018	0.0094
Average 3 Matches	-0.0016	0.0082	-0.002	0.0096
Panel b: NBER				
Portfolio type	Equally weighted		TNA Value weighted	
Market condition	Bear market	Bull market	Bear market	Bull market
SRI	-0.0023	0.0084	-0.0023	0.0101
Best Match	-0.0019	0.0096	-0.0017	0.0106
Average 3 Matches	-0.0019	0.0096	-0.0017	0.0105

Table 13: Average abnormal return of SRI and conventional funds calculated by CAPM: Matches made by selecting conventional funds that commence at the same year as the SRI funds' commencements and end within 1-2 years from SRI closing. Other criteria are the same and close matches are decided based on the TNA on commencement year.

Panel a: Regime switching	Equally weighted				Value weighted			
	Bear market		Bull market		Bear market		Bull market	
	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta
SRI	-0.0603	1.0203	-0.1327	1.0174	0.2114	0.9831	0.0018	0.9509
Best Match	-0.0298	0.9997	-0.1377	1.0087	0.0535	0.9892	-0.0481	0.9602
Average 3 Matches	-0.0248	1.0144	-0.1377	1.0100	0.0398	1.0085	-0.0319	0.9713
Panel b: NBER	Equally weighted				Value weighted			
	Bear market		Bull market		Bear market		Bull market	
	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta
SRI	0.0879	0.9165	-0.1354	1.0101	0.3419	0.9492	-0.0026	0.9506
Best Match	0.0237	0.8875	-0.1266	1.0011	0.0849	0.9539	-0.0419	0.9580
Average 3 Matches	0.0496	0.9145	-0.1314	1.0056	0.0994	0.9717	-0.0314	0.9707

Table 14: Average abnormal return of SRI and conventional funds calculated by Fama-French 3-factor Model:

Matches made by selecting conventional funds that commence at the same year as the SRI funds' commencements and end within 1-2 years from SRI closing. Other criteria are the same and close matches are decided based on the TNA on commencement year.

Panel a: Value Weighted

Bear Regime				
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3
SRI	0.1198	0.9573	0.1980	-0.0253
Best Matching	0.0038	0.9942	0.0716	-0.0866
Average 3 Matches	0.0076	1.0095	0.0622	-0.0622
Bull Regime				
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3
SRI	-0.0051	0.9490	0.0538	0.0204
Best Matching	-0.0749	0.9610	0.0597	0.0464
Average 3 Matches	-0.0518	0.9715	0.0517	0.0421

Pane b: Equally Weighted

Bear Regime				
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3
SRI	-0.0791	0.9932	0.2207	-0.1039
Best Matching	-0.0499	0.9861	0.1690	-0.1293
Average 3 Matches	-0.0663	0.9958	0.1600	-0.0906
Bull Regime				
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3
SRI	-0.1111	0.9897	0.1307	0.0046
Best Matching	-0.1249	0.9749	0.1414	0.0196
Average 3 Matches	-0.1302	0.9838	0.1273	0.0245

Table 15: Average abnormal return of SRI and conventional funds calculated by Fama-French 4-factor Model:

Matches made by selecting conventional funds that commence at the same year as the SRI funds' commencements and end within 1-2 years from SRI closing. Other criteria are the same and close matches are decided based on the TNA on commencement year.

Panel a: Value Weighted

Bear Regime					
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4
SRI	0.0935	0.9557	0.1960	-0.0202	0.0022
Best Matching	-0.0571	0.9891	0.0586	-0.0940	-0.0035
Average 3 Matches	-0.0663	0.9963	0.0401	-0.0791	-0.0206
Bull Regime					
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4
SRI	0.0119	0.9433	0.0602	0.0188	-0.0222
Best Matching	-0.0674	0.9627	0.0592	0.0412	-0.0036
Average 3 Matches	-0.044	0.9704	0.0532	0.0402	-0.0061

Pane b: Equally Weighted

Bear Regime					
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4
SRI	-0.1530	0.9916	0.1853	-0.0930	0.0066
Best Matching	-0.1539	0.9942	0.1268	-0.1381	0.0045
Average 3 Matches	-0.1641	0.9890	0.1164	-0.1137	-0.0205
Bull Regime					
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4
SRI	-0.1082	0.9906	0.1335	0.0020	-0.0077
Best Matching	-0.1198	0.9740	0.1451	0.0167	-0.0084
Average 3 Matches	-0.1223	0.9826	0.1326	0.0217	-0.0121

Table 16: Average abnormal return of SRI and conventional funds calculated by Fama-French 5-factor Model: Matches made by selecting conventional funds that commence at the same year as the SRI funds' commencements and end within 1-2 years from SRI closing. Other criteria are the same and close matches are decided based on the TNA on commencement year.

Panel a: Value Weighted

Bear Regime						
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4	Beta 5
SRI	-0.0142	0.9556	0.2454	-0.0514	0.0928	-0.1238
Best Matching	-0.1296	1.0071	0.0963	-0.1050	0.1097	-0.0721
Average 3 Matches	-0.0912	1.0147	0.0866	-0.0675	0.0815	-0.0901
Bull Regime						
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4	Beta 5
SRI	-0.0373	0.9645	0.0670	-0.0088	0.0505	0.0192
Best Matching	-0.0901	0.9765	0.0796	0.0525	0.0698	-0.0793
Average 3 Matches	-0.0646	0.9834	0.0683	0.0458	0.0590	-0.0558

Panel b: Equally Weighted

Bear Regime						
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4	Beta 5
SRI	-0.2412	0.9941	0.2235	-0.1384	0.0319	-0.0949
Best Matching	-0.2708	1.0077	0.1755	-0.1737	0.1028	-0.0703
Average 3 Matches	-0.2311	1.0000	0.1690	-0.1101	0.0968	-0.1203
Bull Regime						
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4	Beta 5
SRI	-0.1059	1.0007	0.1409	0.0183	0.0286	-0.0924
Best Matching	-0.1020	0.9776	0.1437	0.0364	0.0051	-0.0884
Average 3 Matches	-0.1106	0.9890	0.1289	0.0416	0.0135	-0.0866

Table 17: Average abnormal return of SRI and conventional funds calculated by Fama-French 3-factor Model:

Matches made based on the TNA on each fund's last year. Bear and bull are identified by NBER.

Panel a: Value Weighted

Bear Regime				
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3
SRI	0.0229	0.9780	0.1591	-0.0530
Best Matching	0.0861	0.8562	0.0666	-0.0127
Average 3 Matches	0.0494	0.8913	0.0689	-0.0294
Bull Regime				
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3
SRI	-0.0586	1.0020	0.1021	-0.0378
Best Matching	-0.0874	0.9918	0.0928	-0.0269
Average 3 Matches	-0.0817	0.9827	0.0875	-0.0010

Pane b: Equally Weighted

Bear Regime				
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3
SRI	-0.0249	1.0306	0.1187	-0.0819
Best Matching	-0.0118	1.0421	0.0756	-0.0741
Average 3 Matches	-0.0783	1.0387	0.0863	-0.0836
Bull Regime				
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3
SRI	-0.1363	0.9876	0.1402	-0.0062
Best Matching	-0.1975	0.9966	0.1423	0.0321
Average 3 Matches	-0.1463	0.9884	0.1383	0.0318

Table 18: Average abnormal return of SRI and conventional funds calculated by Fama-French 4-factor Model:

Matches made based on the TNA on each fund's last year. Bear and bull are identified by NBER.

Panel a: Value Weighted

Bear Regime					
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4
SRI	-0.0758	0.9634	0.1531	-0.0658	-0.0195
Best Matching	-0.1986	0.8596	0.0595	-0.0809	-0.0283
Average 3 Matches	-0.1618	0.8927	0.0634	-0.0722	-0.0239
Bull Regime					
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4
SRI	-0.0482	0.9999	0.1063	-0.0409	-0.0156
Best Matching	-0.0907	0.9938	0.0914	-0.0274	0.0077
Average 3 Matches	-0.0823	0.9833	0.0867	-0.0010	0.0037

Pane b: Equally Weighted

Bear Regime					
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4
SRI	-0.2222	0.9766	0.0991	-0.1014	-0.0749
Best Matching	-0.1901	1.0183	0.0746	-0.1007	-0.0566
Average 3 Matches	-0.6497	1.0809	0.1026	-0.2735	-0.0724
Bull Regime					
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4
SRI	-0.1357	0.9905	0.1425	-0.0096	-0.0015
Best Matching	-0.2048	1.0021	0.1406	0.0354	0.0123
Average 3 Matches	-0.1515	1.4330	0.1984	0.0488	0.0070

Table 19: Average abnormal return of SRI and conventional funds calculated by Fama-French 5-factor Model: Matches made based on the TNA on each fund's last year. Bear and bull are identified by NBER.

Panel a: Value Weighted

Bear Regime						
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4	Beta 5
SRI	-0.1170	0.9589	0.1995	-0.0460	0.0769	-0.1579
Best Matching	-0.1157	0.8817	0.1028	-0.0485	0.1662	-0.1098
Average 3 Matches	-0.1186	0.9004	0.1037	-0.0417	0.1334	-0.1216
Bull Regime						
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4	Beta 5
SRI	-0.0532	1.0077	0.1057	-0.0177	0.0077	-0.0728
Best Matching	-0.0817	1.0010	0.0980	-0.0059	0.0143	-0.1040
Average 3 Matches	-0.0731	0.9884	0.0926	0.0219	0.0127	-0.1061

Panel b: Equally Weighted

Bear Regime						
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4	Beta 5
SRI	-0.1535	1.0186	0.1588	-0.0771	0.0742	-0.1345
Best Matching	-0.3659	1.0709	0.1365	-0.0972	0.2225	-0.2172
Average 3 Matches	-0.3624	1.0633	0.1354	-0.1029	0.1998	-0.1700
Bull Regime						
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4	Beta 5
SRI	-0.1263	0.9960	0.1527	0.0084	0.0282	-0.0892
Best Matching	-0.1918	1.0062	0.1384	0.0318	-0.0014	-0.0695
Average 3 Matches	-0.1396	0.9933	0.1371	0.0400	0.0064	-0.0723

Table 20: Average abnormal return of SRI and conventional funds calculated by Fama-French 3-factor Model:

Matches made based on the TNA on the last year of shorter life fund. Bear and bull are identified by NBER.

Panel a: Value Weighted

Bear Regime				
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3
SRI	0.0253	0.9771	0.1656	-0.0554
Best Matching	0.0663	0.8521	0.0752	-0.0121
Average 3 Matches	0.0539	0.8796	0.0986	-0.0285
Bull Regime				
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3
SRI	-0.0594	1.0030	0.1063	-0.0382
Best Matching	-0.0840	0.9831	0.0778	-0.0006
Average 3 Matches	-0.0693	0.9760	0.0746	0.0009

Panel b: Equally Weighted

Bear Regime				
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3
SRI	-0.0254	1.0307	0.1230	-0.0849
Best Matching	-0.0207	1.0199	0.1151	-0.0446
Average 3 Matches	-0.0347	1.0357	0.1036	-0.0788
Bull Regime				
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3
SRI	-0.1372	0.9881	0.1431	-0.0064
Best Matching	-0.1290	0.9892	0.1430	0.0267
Average 3 Matches	-0.1160	0.9801	0.1289	0.0285

Table 21: Average abnormal return of SRI and conventional funds calculated by Fama-French 4-factor Model:

Matches made based on the TNA on the last year of shorter life fund. Bear and bull are identified by NBER for.

Panel a: Value Weighted

Bear Regime					
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4
SRI	-0.0747	0.9622	0.1593	-0.0684	-0.02
Best Matching	-0.1973	0.8513	0.0684	-0.0764	-0.0301
Average 3 Matches	-0.1279	0.8758	0.0921	-0.0622	-0.0223
Bull Regime					
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4
SRI	-0.0490	1.0010	0.1105	-0.0414	-0.0157
Best Matching	-0.0821	0.9843	0.0771	-0.0030	0.0001
Average 3 Matches	-0.0711	0.9775	0.0726	0.0016	0.0072

Panel b: Equally Weighted

Bear Regime					
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4
SRI	-0.2237	0.9762	0.1031	-0.1044	-0.0757
Best Matching	-0.2080	1.0093	0.1150	-0.0918	-0.0454
Average 3 Matches	-0.2418	1.0221	0.1045	-0.1192	-0.0374
Bull Regime					
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4
SRI	-0.1367	0.9911	0.1453	-0.0098	-0.0012
Best Matching	-0.1294	0.9915	0.1417	0.0268	0.0038
Average 3 Matches	-0.1158	0.9819	0.1274	0.0273	0.0035

Table 22: Average abnormal return of SRI and conventional funds calculated by Fama-French 5-factor Model: Matches made based on the TNA on the last year of shorter life fund. Bear and bull are identified by NBER for.

Panel a: Value Weighted

Bear Regime						
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4	Beta 5
SRI	0.0054	0.9419	0.2009	-0.0285	0.1543	-0.0783
Best Matching	-0.1466	0.9884	0.0792	-0.0920	0.1676	-0.0658
Average 3 Matches	-0.1012	0.9940	0.0698	-0.0614	0.1408	-0.0876
Bull Regime						
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4	Beta 5
SRI	-0.0355	0.9623	0.0650	-0.0101	0.0473	0.0192
Best Matching	-0.0806	0.9747	0.0790	0.0552	0.0713	-0.0832
Average 3 Matches	-0.0602	0.9823	0.0671	0.0475	0.0589	-0.0562

Panel b: Equally Weighted

Bear Regime						
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4	Beta 5
SRI	-0.1584	1.0190	0.1606	-0.0745	0.0943	-0.1069
Best Matching	-0.3168	1.0278	0.1571	-0.0866	0.2168	-0.2419
Average 3 Matches	-0.3255	1.2524	0.1697	-0.1040	0.2611	-0.2553
Bull Regime						
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4	Beta 5
SRI	-0.1126	0.9944	0.1452	0.0118	0.0313	-0.0837
Best Matching	-0.0865	0.9749	0.1433	0.0356	0.0071	-0.0947
Average 3 Matches	-0.1217	1.2098	0.1585	0.0511	0.0174	-0.1076

Table 23: Average abnormal return of SRI and conventional funds calculated by Fama-French 3-factor Model:

Matches made by selecting conventional funds that commence at the same year as the SRI funds' commencements and end within 1-2 years from SRI closing. Other criteria are the same and close matches are decided based on the TNA on commencement year. Bear and bull are identified by NBER.

Panel a: Value Weighted

Bear Regime				
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3
SRI	0.1853	0.9237	0.1530	0.0074
Best Matching	0.0704	0.9516	0.0389	-0.0532
Average 3 Matches	0.1040	0.9659	0.0305	-0.0268
Bull Regime				
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3
SRI	-0.0087	0.9488	0.0522	0.0176
Best Matching	-0.0668	0.9596	0.0551	0.0464
Average 3 Matches	-0.0492	0.9713	0.0485	0.0422

Pane b: Equally Weighted

Bear Regime				
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3
SRI	-0.0348	0.9048	0.1119	-0.0626
Best Matching	0.0134	0.8685	0.0838	-0.0590
Average 3 Matches	0.0602	0.8896	0.0772	-0.0393
Bull Regime				
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3
SRI	-0.1154	0.9836	0.1331	0.0016
Best Matching	-0.1104	0.9660	0.1413	0.0169
Average 3 Matches	-0.1207	0.9782	0.1268	0.0229

Table 24: Average abnormal return of SRI and conventional funds calculated by Fama-French 4-factor Model:

Matches made by selecting conventional funds that commence at the same year as the SRI funds' commencements and end within 1-2 years from SRI closing. Other criteria are the same and close matches are decided based on the TNA on commencement year. Bear and bull are identified by NBER.

Panel a: Value Weighted

Bear Regime					
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4
SRI	0.1589	0.9245	0.1525	0.0044	-0.0002
Best Matching	-0.0318	0.9528	0.0397	-0.0772	-0.0093
Average 3 Matches	-0.0467	0.9567	0.0260	-0.0591	-0.0243
Bull Regime					
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4
SRI	0.0074	0.9444	0.0581	0.0164	-0.0171
Best Matching	-0.0646	0.9632	0.0520	0.0438	0.0056
Average 3 Matches	-0.0434	0.9709	0.0490	0.0414	-0.0025

Pane b: Equally Weighted

Bear Regime					
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4
SRI	-0.1924	0.8654	0.0955	-0.0836	-0.0589
Best Matching	-0.1278	0.8627	0.0834	-0.0912	-0.0230
Average 3 Matches	-0.1320	0.8550	0.0684	-0.0661	-0.0588
Bull Regime					
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4
SRI	-0.1147	0.9856	0.1373	-0.0011	-0.0040
Best Matching	-0.1120	0.9672	0.1424	0.0161	-0.0002
Average 3 Matches	-0.1170	0.9788	0.1298	0.0210	-0.0054

Table 25: Average abnormal return of SRI and conventional funds calculated by Fama-French 5-factor Model: Matches made by selecting conventional funds that commence at the same year as the SRI funds' commencements and end within 1-2 years from SRI closing. Other criteria are the same and close matches are decided based on the TNA on commencement year. Bear and bull are identified by NBER.

Panel a: Value Weighted

Bear Regime						
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4	Beta 5
SRI	0.0054	0.9419	0.2009	-0.0285	0.1543	-0.0783
Best Matching	-0.1466	0.9884	0.0792	-0.0920	0.1676	-0.0658
Average 3 Matches	-0.1012	0.9940	0.0698	-0.0614	0.1408	-0.0876
Bull Regime						
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4	Beta 5
SRI	-0.0355	0.9623	0.0650	-0.0101	0.0473	0.0192
Best Matching	-0.0806	0.9747	0.0790	0.0552	0.0713	-0.0832
Average 3 Matches	-0.0602	0.9823	0.0671	0.0475	0.0589	-0.0562

Panel b: Equally Weighted

Bear Regime						
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4	Beta 5
SRI	-0.1584	1.0190	0.1606	-0.0745	0.0943	-0.1069
Best Matching	-0.3168	1.0278	0.1571	-0.0866	0.2168	-0.2419
Average 3 Matches	-0.3255	1.2524	0.1697	-0.1040	0.2611	-0.2553
Bull Regime						
<i>Average</i>	Alpha	Beta 1	Beta 2	Beta 3	Beta 4	Beta 5
SRI	-0.1126	0.9944	0.1452	0.0118	0.0313	-0.0837
Best Matching	-0.0865	0.9749	0.1433	0.0356	0.0071	-0.0947
Average 3 Matches	-0.1217	1.2098	0.1585	0.0511	0.0174	-0.1076