Title: Effect of Positive Screens on Financial Performance: Evidence from Ethical Mutual Fund Industry

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Effect of Positive Screens on Financial Performance: Evidence from Ethical Mutual Fund Industry

Abstract- In this paper we study the effect of positive screens on SR mutual funds financial performance. With this aim, we test the financial performance of three different SR mutual funds: those which implement a combination of positive and negative screens, those which only consider negative screens and those which are religious and whose investment strategy usually consists of negative screens. We also analyze three conventional matched-pair portfolios.

Our results indicate that mutual funds which implement positive screens achieve better financial performance than those which do not, and moreover do not underperform their conventional counterparts. Additionally our results are robust after size effect control and they are not sensitive to intensity of positive screens. However the positive effect from positive screens tends to disappear over time.

We also carry out control by stock-picking and market timing abilities. The three SR portfolios do not show timing ability. Moreover, we note that the "Negative Screens" and "Religious" portfolios show a significant and negative stock-picking ability. However the Positive Screen portfolio gets a non-significant alpha coefficient.

Keywords- Positive screens, Negative screens, Religious mutual funds, Financial performance, Stock-picking and Market timing

Introduction

According to Eurosif1's 2010 European Socially Responsible Investment (SRI) Study, SRI is *a generic term covering any type of investment process which combines investors' financial objectives with their concerns about environmental, social and governance (ESG) issues*.

SRI has shown a great growth in last years around the world. Total SRI assets under management in Europe reached around €5,000 billion at the end of 2009 and around $3,000 billion at the end of 2010 in the USA.

In this context, Socially Responsible (SR) mutual funds are one of the most important financial products. For example, according to the Social Investment Forum[2] (SIF), 493 SR mutual funds managed $569 billion in the USA in December 2010. Taking into account these impressive figures, the interest that SRI has raised in the financial literature is understandable.

A manager of a SR mutual fund takes the investment decisions considering not only financial aspects (as in the case of a conventional mutual fund manager), but also environmental, social and governance (ESG) issues. SR mutual funds implement several screening processes in order to choose stocks complying with specific ESG criteria.

As stated by Climent & Soriano (2011) there are two main groups of SRI studies: those which analyze the SR investors' behavior and those which analyze the financial performance of sustainable investments.

With regards to the second topic, existing studies find in general terms that SR mutual funds show a very similar financial performance to their conventional counterparts. Nevertheless, many of these studies suffer from an important bias, since they do not consider the different SRI strategies that a SR mutual fund may implement.

That is, it is not the same to implement a negative screen strategy [to remove stocks from "Sin" industries[3], for example] as to implement a positive screen strategy [to select stocks with good records on environmental issues, for example]. Each of these strategies may lead to different financial performance results.

In this paper we will analyze the financial performance of SR mutual funds, controlled by the type of SR strategy implemented, an issue widely neglected in financial literature. Specifically, we will study in depth the effect of positive screens on SR mutual funds financial performance. With this aim, we will implement a comparative analysis between SR mutual funds which implement a strategy based on a combination of positive and negative screens[4] and SR mutual funds which only implement negative screens. Moreover, we build a matched pair sample of conventional mutual funds for each of the kinds of SR mutual funds considered. Finally, we carry out several robustness tests.

In this way, we extend the prior empirical evidence about the effect of positive screens on financial performance, using a more sophisticated methodology (multifactorial performance model) than in prior articles as Goldreyer et al. (1999); implementing the analyses on a broad and updated sample of conventional and SR mutual funds in comparison to the study of Kempf & Osthoff (2007) who analyze the effect of positive screens from a sample of portfolios built by stocks based on the SRI ratings of KLD Research & Analytics; and controlling by several important effects such as, size effect, performance over time, intensity of positive screens and market timing strategies.

The organization of the paper is as follows. Section 2 deals with the research hypothesis and reviews the literature. Section 3 briefly describes the data used in the study. Section 4 explains the methodology used in the analyses. Section 5 shows the empirical results. In section 6, several robustness tests are developed. Section 7 concludes the study.

Research Hypothesis

It has traditionally been supposed that SR investors may show a multifactorial utility function which includes financial and non-financial attributes. In this way, an SR investor may be willing to invest in an SR mutual fund or hold his/her money in it even though the financial performance provided by this fund is not very high, since the loss of utility from financial attributes can be offset by the gain in utility from non-financial attributes[5]. It seems that SR investors implement a values-driven investment approach in which moral and personal values play a main role in the investment decisions [Derwall et al. (2011)].

There are several results in literature which seem to converge towards this assumption. For example, Renneboog et al (2008) highlight in their work two interesting results from SIF reports:

"… *during the stock market downturn over the first 9 months of 2001, there was a 94% drop in the money inflows into all US mutual funds, whereas the fall in net investments in socially screened amounted to merely 54%*".

"*Typically, social investors' assets are "stickier" than those of investors concerned only with financial performance. In other words, social investors have been less likely to move investments from one fund to another and more inclined to stay with funds than conventional investors*".

Additional evidence is provided by the existing empirical analyses about the flow-performance ratio for SR investors. Bollen (2007), Benson & Humphrey (2008), Peifer (2010) and Renneboog et al. (2011) obtain results supporting the next hypothesis: financial performance has less influence on SR mutual fund net flows and SR investors' investment decisions in comparison to their influence on conventional mutual funds.

Another argument for this assumption is suggested by Benson & Humphrey (2008). These authors believe that SR investors may suffer lower fund flow volatility than conventional investors due to the limited number of funds which satisfy their non-financial criteria[6].

On the other hand, many studies have analyzed whether ethical fund investors suffer a cost (resulting in poorer financial performance) for investing in SR investment portfolios instead of conventional funds.

Some of these articles are as follows. Luther et al. (1992), Mallin et al. (1995) or Gregory & Whittaker (2007) for the UK; Goldreyer et al (1999), Statman (2000) or Gezcy et al. (2006) for the US market; and Bauer et al. (2005), Kreander et al. (2005), Bauer et al. (2006), Bauer et al. (2007) and Renneboog et al (2008 b) for other markets.

From the traditional Financial Theory point of view, when an investor chooses to invest in an SR mutual fund, he/she makes a deliberate choice to concentrate on a subset of assets in which to invest. In a theoretical mean-variance context[7], such a strategy results in a suboptimum portfolio, i.e., in poorer financial performance with regards to a portfolio without a restricted stock universe.

Despite what the traditional financial theory says, the empirical evidence about this topic is mixed. In this way, although some studies obtain different results for each kind of funds, the majority of the above articles do not find any significant differences between the financial performances of the two types of funds.

Nevertheless, all these results could be suffering from an important bias since many of them do not consider the SR strategy implemented by a fund. That is, these studies analyze if conventional and SR mutual funds provide a different financial performance, considering the SR mutual fund as a homogenous category, when really there could be many differences between SR mutual funds [green funds, religious funds, social funds,…].

Recently some papers have controlled financial performance by the different type of screens implemented by the SR funds. The scarce empirical evidence seems to indicate that this aspect is important when the financial performance of SR mutual funds is analyzed.

Goldreyer et al. (1999) examine a sample of 49 mutual funds. One of the analyses carried out by these authors is the partition of the sample into funds that implement inclusion (positive) screens and those that do not employ this kind of screens. Their results indicate that mutual funds that use inclusion screens outperform funds that do not implement this type of screens.

Kempf & Osthoff (2007) also find that a positive screens strategy obtains a better result than other kind of SRI strategies. However these results are not obtained from a mutual funds sample but from portfolios of stocks built based on SRI ratings of KLD Research & Analytics.

Other studies have analyzed the relationship between intensity of screens (number of screens considered by a fund) and financial performance. That is the case of Barnett & Solomon (2006) and Lee et al. (2010). Both studies show a curvilinear relation between intensity of screens and financial performance.

Renneboog et al. (2008 b) report that funds which invest in firms which adopt policies focused on community involvement achieve better financial performance. With regards to the intensity of screens, these authors obtain that fund returns decrease with screening intensity.

Climent & Soriano (2011) test the financial performance of a sample of environmental mutual funds. Their results indicate that Green funds underperform conventional funds with similar characteristics in the 1987-2009 period. However, Green and conventional funds achieve a very similar financial performance in the 2001-2009 period.

Religious mutual funds also have been analyzed in the financial literature. While some authors conclude that this kind of mutual funds outperform the market and other kind of SR mutual funds [Lyn & Zychowicz (2010), for example], other authors find the contrary result [Ferruz et al. (2011), for example].

Derwall et al. (2011) find an explanation for all these differences in financial performance according to the type of SRI strategy implemented by a fund. These authors suggest that the SRI movement could be split in two different investors segments (with a different investment behavior).

On the one hand the value-driven investors, who base their investment decisions on social and personal values (these investors would be willing to accept a loss in financial performance in exchange for non-financial utility). On the other hand the profit-seeking

investors, who use socially responsible investment as a strategy to achieve abnormal financial performance.

Taking into account the results shown by Renneboog et al (2011)[8], Derwall et al. (2011) consider that value-driven investors employ negative screens based on ethical or moral criteria (to exclude stocks from Sin industries, for example). While profit-seeking investors implement other kind of SR strategies, specially based on positive screens (to select companies with good record in ESG issues, for example).

Besides, value-driven investors that implement negative screens (based on excluding Sin industries, for example) may suffer a penalty in financial performance since this kind of stocks (Sin stocks) could provide superior financial returns as suggested by Hong & Kacperczyk (2009)[9]. Nevertheless, as this kind of investors get utility from non-financial attributes (to invest according with their moral principles), it offsets the loss in financial performance resulting of the implementation of negative screens.

For other hand, profit-seeking investors could be obtaining a superior financial performance from their SR strategies. There are some articles which show how companies with positive records on environmental and responsibility issues provide superior stock returns and positive earnings surprises [Derwall et al. (2005), Kempf & Osthoff (2007), Statman & Glushkov (2009)].

The hypothesis behind these results is that Corporate Socially Responsible (CSR) information is value-relevant and the market is slow to recognize the positive impact that strong CSR practices have on companies' expected future cash flows.

The value of environmental, social and governance information has been analyzed in several empirical works. Derwall et al. (2005) show how companies highly ranked in eco-efficiency issues provide substantially higher average returns than their lower ranked counterparts. The authors propose two explanations for this result. Firstly, the stock market undervalues the environmental information. Secondly, the eco-efficiency premium captures the premium of some missing risk factors in asset pricing models.

The same explanations are put forward by Kempf & Osthoff (2007) for their results. These authors build a portfolio with companies presenting good records in the following issues: community, diversity, employee relations, environment, human rights and products. They find that this portfolio achieves a better financial performance than other portfolios built by implementing negative screens (excluding firms dedicated to alcohol, tobacco, gambling, military, nuclear powers and firearms).

As Derwall et al. (2011) maintain that CSR practices are multidimensional and in some cases subjective, which results in the market failing to value some CSR practices properly.

These authors examine whether the two views of SRI (values-driven and profit-seeking) can coexist in the long run. They build two portfolios, one formed by Sin stocks and the other consisting of companies with good scores in employment relations. Both portfolios have a positive abnormal return. However, while the financial performance of the Sin stocks portfolio is more or less constant throughout, the SR stocks portfolio shows decreasing financial performance over time. Although the CSR information is initially value-relevant, the superior return of this strategy disappears as investors learn about sources of firms' future cash flows.

In this manner, the value-relevant approach is durable in time although it provides an inferior performance, since investors get utility from non-financial attributes. However, the

advantage in financial performance provided by a profit-seeking approach tends to disappear as conventional investors incorporate CSR information in their decisions.

In this paper we want to empirically contrast all the hypotheses proposed by Derwall et al. (2011) and the results found by Kempf & Osthoff (2007), but using the information from SR mutual funds which implement strategies characteristic of value-driven and profit-seeking approaches.

One problem in checking these questions with SR mutual fund data, as detected by Derwall et al. (2011), is the fact that the vast majority of SR mutual funds use a combination of positive and negative screens, which could override the effect promoted by the different kind of screens. However there are mutual funds which only implement negative screens and others which implement both negative and positive screens.

We could extract empirical evidence comparing both types of SR mutual funds, although both implement negative screens, since in the case of SR mutual funds which also implement positive screens, the latter could offset the effects of the former.

The review and arguments above lead us to pose the following research hypotheses:

Hypothesis 1: Socially Responsible mutual funds implementing positive screens achieve a better performance than SR mutual funds which do not.

Hypothesis 2: Socially Responsible mutual funds which fulfill religious concerns show poorer financial performance than SR mutual funds which implement positive screens.

Hypothesis 3: The superior financial performance of SR mutual funds which implement positive screening tends to disappear over time.

Additionally we test if mutual fund size has an influence on its financial performance, as examined by Renneboog et al (2008 b). Besides, we check whether intensity of positive screens affects the results achieved. Finally, we control our results by the stock-picking or market timing ability of mutual fund managers in order to test SR mutual fund financial performance may come from the manager's abilities or from focusing on socially responsible strategies.

We contribute to financial literature by providing evidence, previously somewhat lacking, about the financial performance of different ethical mutual funds. Specifically we study in depth the effect of positive screens on financial performance, improving the prior study of Goldreyer et al. (1999) in two main areas: the methodological approach (they use unifactorial financial performance measures and we will use multifactorial performance models); the robustness tests (we extent the prior empirical evidence, implementing several robustness tests that contribute to increase the relevance of our results). Finally, we also test the findings of Derwall et al. (2011) with data from an SR mutual funds sample, interpreting our results considering the hypothesis developed by these authors.

Data

The monthly data on US mutual funds come from Thomson Reuters. The database comprises the monthly returns (net of fees) and the monthly TNA (Total Net Assets) of all the Socially Responsible (SR) mutual funds with an "Equity North America" investment vocation, domiciled in the United States in the period from January 1994 to September 2010. Our database is free of survivorship bias as all the SR domestic equity mutual funds existing at some point during the analyzed period are considered[10].

In accordance with the procedure of Renneboog et al. (2011), we aggregate different share classes for a given fund into one observation using the method implemented by these authors[11].

We obtained the information about screens implemented for the SR mutual funds from socialfunds.com[12]. This website provides information about the screens implemented for US SR mutual funds for the following issues: environment, human rights, employment, product safety, weapons, animal rights, nuclear power, alcohol, tobacco and gambling. From this site we collected information for 49 SR mutual funds [in appendix 1, we show the list of mutual funds which implement at least 1 positive screen and in appendix 2 there is a list of SR mutual funds which implement negative screens; all funds in appendix 2, except one, are of religious nature].

Additionally, we were able to identify 43 religious SR mutual funds from other sources such as SIF or mutual fund prospectuses (9 of them were included in the list above). We were not able to find precise information about the screens implemented by some of these funds but the SR strategy of religious mutual funds typically consists of negative screens[13], excluding industries considered "Sin" or "unethical"[14] [the list of religious mutual funds considered is set out in appendix 3].

In order to test our research hypotheses we implemented the 4-factor Carhart model [Carhart (1997)] on portfolios formed by mutual funds which implement each type of SR strategy. In this manner we built the following portfolios:

- One portfolio formed by the SR mutual funds which implement at least one positive screen, built from 39 SR mutual funds. We call this "Positive Screens Portfolio".
- One portfolio formed by 10 SR mutual funds which only consider negative screens. We call this "Negative Screens Portfolio".
- One portfolio formed by religious SR mutual funds, built from 43 SR mutual funds. We call this "Religious Portfolio".

Moreover, in order to test the size effect we built size-weighted portfolios for each of the above portfolios. The summary statistics of the six portfolios are provided in table 1:

Insert Table 1

Additionally, with the aim of comparing the results from each type of SR mutual fund portfolio relative to that of conventional mutual funds, we build a control group of conventional US investment vocation mutual funds for each type of SR portfolio. In order to build this control group, we followed the same methodology as Bollen (2007), who uses two matching procedures.

Firstly, for each SR fund, only those conventional funds with first and last years in the database that are within three years of the first and last years of the SR under consideration are eligible as candidates. With this first step, Bollen wants to ensure that the funds analyzed suffer similar macroeconomic time-series effect. Besides, in order to control for age, the conventional fund have to be no more than three years younger or older than the SR fund.

Secondly, for a given SR fund, all eligible funds are scored based on the distance between the conventional fund's size and β coefficients and the SR fund's size and β coefficients[15]. Finally, for each annual observation of SR fund flow, fund flows from the three conventional funds with the shortest distance to the SR fund are added to the control group. Through this procedure, we find a matched sample of US domestic equity conventional mutual

funds comprising 105 funds for "Positive Screens" SR portfolio, 24 funds for "Negative Screens" SR portfolio and 110 funds for "Religious" portfolio. The summary statistics of these three portfolios are provided in table 2:

Insert Table 2

Methodology

In order to analyze the financial performance of SR mutual funds controlled by the type of SR screens strategy used, we implement the 4-factor Carhart model [Carhart (1997)] on each of the aforementioned portfolios. Some of the most recent papers about the financial performance of SR mutual funds have implemented this methodology [Bauer et al. (2005), Bauer et al. (2006), Bauer et al. (2007), Kempf & Osthoff (2007) or Climent & Soriano (2011), among others].

The 4-factor Carhart model is shown in the following expression:

$$r_{it} = \alpha_{iT} + b_{iT} RMRF_t + s_{iT} SMB_t + h_{iT} HML_t + p_{iT} PR1YR_t + e_{it} \quad (1)$$

in which r_{it} refers to the excess return of portfolio i on the risk-free asset[16] at the moment t; α_{it} is the 4-factor-adjusted return of the portfolio; $RMRF_t$ is the excess return on the risk-free asset of the benchmark market for portfolio i at the moment t[17]; SMB_t is the size factor, HML_t is the book-to-market factor and $PR1YR_t$ is the momentum factor[18].

SMB_t (Small minus Big) is the mean return of the three small portfolios minus the mean return of the three large portfolios:

$$SMB = 1/3 \left(SmallValue + SmallNeutral + SmallGrowth \right)$$
$$- 1/3 \left(BigValue + BigNeutral + BigGrowth \right)$$

HML_t (High minus Low) is the mean return of two value portfolios minus the mean return of two growth portfolios:

$$HML = 1/2 \left(SmallValue + BigValue \right) - 1/2 \left(SmallGrowth + BigGrowth \right)$$

Regarding the momentum factor at one year ($PR1YR_t$), Carhart (1997) in his work describes how this is constructed. It is done by calculating the equally-weighted mean portfolio formed by the 30% of securities which produced higher returns over the last 11 months, lagged one month, minus the equally-weighted mean portfolio formed by the 30% of securities which obtained lower returns over the last 11 months, lagged 1 period.

To check the presence of stock-picking and market timing abilities, one of the most widely used models in financial literature is the one proposed by Treynor & Mazuy (TM) (1966). This model is set out in the following expression:

$$r_{it} = \alpha_{iT} + b_{iT} RMRF_t + \gamma_{iT} RMRF_t^2 + e_{it} \quad (2)$$

in which r_{it} refers to the excess return of portfolio i on the risk-free asset at the moment t; α_{iT} is the stock-picking ability of the manager, in which a positive and significant α would indicate correct stock-picking ability; $RMRF_t$ is the excess return on the risk-free asset of the benchmark market for portfolio i at the moment t; γ_{iT} measures the market return timing ability of the manager. If a manager increases (reduces) market exposure before the market is bullish (bearish), this would indicate that the manager is capable of suitable market timing, the

return of the fund will be a convex function of market return and the gamma coefficient will adopt a significant positive sign.

This model is based on the existence of a convex relationship between the return of the fund and the return of the market, meaning the manager increases market exposure (specific risk) in the event of an increase in market return, with the reverse being true in the event of a reduction in market return. This is what is known as market timing.

In this sense, Bollen & Busse (2001), taking the multifactorial performance measurement models [Fama & French (1993) and Carhart (1997)] as a reference, propose extending the TM timing model (1966), in order to take into account the factors/styles set out in these models. The following expression contains the extension used in the work of Bollen & Busse (2001):

$$r_{it} = \alpha_{iT} + \sum_{j=1}^{4} \beta_{iT,j} r_{j,t} + \gamma_p RMRF_t^2 + e_{it} \qquad (3)$$

in which the summation refers to the Carhart 4-factor model (1997), i. e. the market as a whole, size factor (SMB), book-to-market factor (HML) and momentum factor (PR1YR). We will implement regression 3 on our SR portfolios in order to control the financial performance results by managers' stock-picking and market timing abilities.

Empirical results

Table 3 shows the results when we implement the 4 factor Carhart Model on the different portfolios:

Insert Table 3

First, if we compare the results from the "Positive Screens" portfolio with the results from "Negative Screens" portfolio we can see how the first have a non-superior financial performance [the alpha coefficient achieved by this portfolio is near 0 and non-significant] while the second one has a significant negative alpha coefficient. In the case of "Religious portfolio[19]", we observe that it achieves a very similar result to "Negative Screens" portfolio. Taking into account that the Religious fund strategy mainly consists of excluding "Sin" or "unethical" companies from its universe of stocks, this result is not surprising.

All this empirical evidence could indicate that the positive screens contribute in a positive way to the financial performance of an SR mutual fund, since the mutual funds which make up the Positive Screens portfolio implement both positive and negative screens but do not have the negative financial performance of the other categories ["Negative Screens" and "Religious"] which only implement negative screens.

All these results support the findings of other authors such as Goldreyer et al. (1999) and Kempf & Osthoff (2007) who find that positive screen strategies provide better financial performance than negative screens.

Moreover, if we compare the results achieved by the different SR portfolios with their matched-pair conventional portfolio, we note that in the case of the "Positive Screens" portfolio it performs equally to their conventional counterpart, and in the case of "Negative Screens" and "Religious" portfolios they underperform their conventional counterparts. These results show that an SR strategy consisting of excluding certain kinds of companies could lead to underperformance, while an SR strategy consisting of picking stocks with good records in

ESG issues achieves good financial performance which offsets the negative effect of negative screens.

The portfolios formed by SR mutual funds which implement positive screens will fulfill the aims of profit-seeking investors (these funds do not perform differently to conventional ones). At the same time, portfolios with negative screens representative of value-driven investors have an inferior financial performance. However these investors could get utility from non-financial attributes, so they may be willing to assume this loss of financial performance. From these results we can accept our two first hypotheses.

Robustness tests
Size effect

The effect of portfolio size on the financial performance obtained by the portfolio has been widely analyzed in financial literature. These works include the following for conventional mutual funds: Chen et al. (2004), Chan et al. (2005) and Gallagher & Martín (2005), among others. In the case of SR mutual funds, size effect on financial performance is considered by Gregory et al. (1997), Girard et al. (2007) or Renneboog et al. (2008 b), among others.

To implement this analysis we build three size-weighted SR portfolios. We implement the 4-factor Carhart on these portfolios:

Insert Table 4

If we compare the results obtained for equally-weighted portfolios (table 3) with the results shown in table 4 (4-factor Carhart model for size-weighted portfolios) we note that both kinds of portfolio (equally-weighted and size-weighted) for the three SR categories considered (Positive Screens, Negative Screens and Religious) show very similar results. We can conclude that size does not affect the financial performance of the SR mutual fund analyzed [in line with Gregory et al. (1997), Girard et al. (2007) or Renneboog et al. (2008 b)]. Moreover, the kind of SR strategy is irrelevant in size-effect.

Performance over time

The superior financial performance of SR mutual funds which implement positive screens (superior in comparison with the financial performance of SR mutual funds applying only negative screens) could be generated by the fact that markets misprice CSR information. However, as demonstrated by Derwall et al. (2011), this SR approach is not durable in time and the superior financial performance that it generates disappears over time as investors learn about the sources of firms' future cash flows.

We want to test this interesting empirical result by analyzing SR mutual funds which implement positive screens. We therefore split our temporary sample (Jan-1994 to Sep-2010) in two equal-length temporary subsamples [the first time sample is from January 1994 to April 2002 and the second from May 2002 to September 2010], and we estimate the 4-factor Carhart model for each of our equally-weighted portfolios in the two temporary subsamples.

The results are shown in table 5:

Insert Table 5

We note that in the case of the "Negative Screens" and "Religious" portfolios, the results achieved are quite similar in the two temporary subsamples, in other words, a negative, significant alpha coefficient is achieved in both portfolios for both periods, indicating that SR

mutual funds which implement only negative screens strategies show a negative financial performance persistent over time.

However, for the "Positive Screens" portfolio we observe a different result according to the temporary subsample considered. The mutual funds which implement positive screens are able to achieve non-negative financial performance in the first time subsample. However, in the second period this is not the case. This result provides empirical evidence from SR mutual funds for the results reached by Derwall et al. (2011). The superior financial performance provided by a positive screen strategy disappears over time. This result leads us to accept our third hypothesis.

Intensity of positive screens

Recently, several authors have examined the relation between the intensity of screens (number) implemented by a SR mutual fund and its financial performance. The results are mixed. On the one hand, Barnett & Solomon (2006) and Lee et al. (2010) find a curvilinear relation. On the other hand, Renneboog et al. (2008 b) report that fund returns decrease with screening intensity. Anyway, it seems that the number of screens implemented by the SR mutual funds may have an influence on their financial performance.

In this robustness test, we check if the number of positive screens implemented by a fund has an influence on the financial performance. To do it, we divide our sample of mutual funds that at least implement one positive screen in two groups: those that implement positive screens in the four issues considered by SocialFunds.com (environment, human rights, employment, product safety), and those that no implement the four positive screens but at least consider one of them. In this way, we build two portfolios:

- One formed by 32 mutual funds that implement positive screens in the four aforementioned issues

- Another formed by 7 mutual funds that no implement the 4 positive screens but at least implement 1 positive screen

In table 6, we show the results of the 4-factor Carhart model for the two above portfolios and for the "Positive Screens" portfolio:

Insert Table 6

From the results, we note that there is not differences among the three portfolios with regards to the financial performance (in the three cases it is reached alpha coefficients very near to zero and non-significant). This result leads us to think that the intensity of positive screens do not have any influence on the financial performance.

Stock-picking and market timing abilities

Within the framework of active management, it has traditionally been supposed that a manager's success is determined by his/her ability to choose stocks which outperform other securities with a similar level of non-diversifiable risk. This strategy is known as stock-picking.

The other strategy employed by managers to improve their results is to seek to change their exposure to the market at the right moment. Specifically, a good manager will maintain a higher beta in a bull market and a lower beta in a bear market. This is market timing strategy. Market timing involves swapping securities with different betas or changing the proportion of the portfolio invested in different stocks.

Using this robustness test we will examine the source of the financial performance for each kind of SR strategy. Although the financial performance of SR mutual funds has been extensively analyzed in financial literature, there are few studies of the stock-picking and market timing abilities of SR mutual fund managers.

Most notable among these few works are the papers of Schröeder et al. (2004), Kreander et al. (2005) and Renneboog et al. (2008b). All these papers show little evidence that SR mutual fund managers are able to time the market.

Testing for the presence of these abilities among mutual fund managers is important, since Kempf & Osthoff (2007) point out that the performance of SR mutual funds could be provided by the managers' abilities and not from focusing on socially responsible investments.

In table 7, we show the results from the 4-factor Carhart model extended in order to incorporate the TM (1966) timing variable[20]:

Insert Table 7

First, we note how the SR portfolios analyzed do not show market timing abilities. All of them achieve a positive but non-significant gamma coefficient. This result is in line with the scarce empirical evidence existing about market timing for SR mutual fund managers and allows us to reject the assumption that the financial performance results of SR mutual funds are generated by the positive or negative market timing ability of the mutual fund manager.

Regarding the coefficient alpha which represents stock-picking ability, we observe that the "Negative Screens" and "Religious" portfolios show a negative, significant alpha coefficient. This result could be interpreted as inferior stock-picking ability resulting from the implementation of negative screens.

Negative screens exclude from the universe of stocks companies from controversial sectors, which could give abnormal positive financial performance. In this way, a manager who implements an SR strategy consisting only of excluding this kind of stocks may show a worse financial performance, as our results have shown.

The Positive Screen portfolio shows a non-significant alpha coefficient. This result indicates that a manager who implements positive screens does not show negative stock-picking ability. This finding may be the result of two effects: a negative effect from negative screens (as we demonstrated in the two other SR portfolios), and a possible positive effect from the implementation of positive screens, which could offset the first effect.

Several empirical works (see the two first parts of this paper) show how good performance in ESG issues and good financial performance are positively related. In this way an SR mutual fund manager who implements both positive and negative screens obtains a negative effect on his/her stock-picking abilities from negative screens (excluding companies from controversial sectors with a good financial performance) but this is offset by a positive effect from investing in companies with good ESG records.

Conclusions

Several recent findings indicate that SR investors may show different sensitivity to financial performance according to the SR strategy implemented. In this way, we could find value-driven investors who are willing to accept a loss in financial performance in exchange for non-financial utility and who usually implement negative screens.

On the other hand profit-seeking investors use SRI as a strategy to achieve good financial performance and usually implement positive screens.

We test the effect of positive screens on financial performance achieved by SR mutual funds. To do it, we analyze financial performance of SR mutual funds that implement different type of strategies, an aspect widely neglected in financial literature.

To this end we form three portfolios: one built from mutual funds which implement at least one positive screen in the following areas: environment, human rights, employment or product safety; another built from mutual funds which implement at least one negative screen in the following areas: weapons, animal rights, nuclear power, alcohol, tobacco and gambling, and do not implement any positive screens; finally we form a portfolio from religious mutual funds (mutual funds which typically implement negative screens, excluding industries considered "Sin" or "unethical"). Additionally we build one conventional matched-pair portfolio for each SR portfolio.

The results reached from the 4-factor Carhart model show how the funds that at least consider one positive screen, achieve a superior financial performance than the portfolios formed by religious mutual funds and mutual funds which implement negative screens. Moreover, the Positive Screen portfolio performs equally to its conventional matched-pair portfolio. However, Religious and Negative Screens Portfolios show an inferior negative financial performance in comparison to their conventional counterparts. All these results indicate that positive screens offset the negative effect on financial performance from implementing negative screens. Additionally our results are robust after size effect control. Another robustness test reveals that the intensity of positive screens does not affect to the financial performance.

We also test whether the positive financial performance from a profit-seeking approach tends to disappear over time. To do this we split our time sample in two subsamples. For a sample of SR mutual funds, our results confirm and generalize to other kind of positive screens the empirical evidence reached by Derwall et al. (2011) from portfolios built with companies which show good records on employment relations.

The advantage in the financial performance of the SR profit-seeking approach is not long-lasting, since it disappears over time as investors learn about the sources of firms' future cash flows.

Finally, we control the presence of timing abilities. The results obtained allow us to reject the idea that differences from SR strategies are driven by managers' timing abilities.

The Religious and Negative Screens portfolios show negative stock-picking abilities, resulting from an SR strategy consisting solely of removing "Sin" and "unethical" companies from the eligible universe of stocks. However, the Positive Screens portfolio shows non-significant stock-picking ability which may be the result of two effects, one negative from the implementation of negative screens and another positive from the consideration of positive screens in investment decisions.

Footnotes:

[1] Eurosif (the European Sustainable Investment Forum) is a pan-European network and think-tank whose mission is to develop sustainability through European financial markets. (http://www.eurosif.org/)

[2] The Social Investment Forum (SIF) is the US membership association for professionals, firms, institutions and organizations engaged in socially responsible and sustainable investing. (http://www.socialinvest.org/)

[3] Such as Tobacco, Alcohol or Gambling

[4] We did not find any SR mutual fund that implements only positive screens

[5] As Renneboog et al. (2008) argue that if investors derive non-financial utility from investing in SRI, SRI growth may be expected to continue although its financial performance is below that of conventional investments.

[6] In this regard, an investor concerned about labour relations issues will achieve non-financial utility (for example) from an SR mutual fund which picks firms which provide good workplace conditions. However, this investor will not move his/her money to Green mutual funds (for example) which excludes firms which harm the Environment, since this is not an alternative which provides him/her with non-financial utility.

[7] Markowitz (1952) defines a portfolio as mean-variance efficient if it provides the major expected return for a given level of variance (risk), and the lowest variance for a given level of expected return. To maximize the risk/return relationship, investors make up their portfolio by selecting from the investment universe those investments which would make up the efficient portfolio. In theory, selecting from only a subset of the investment universe (for example, selecting from among socially responsible companies only) could result in a suboptimum portfolio.

[8] Renneboog et al (2011) find that SRI money flows are less related to past fund returns than conventional fund flows for Sin and ethical negative screen SR mutual funds, but money flows into funds with environmental screens are more sensitive to past positive returns than conventional fund flows.

[9] Hong & Kacperczyk (2009) show how society norms lead to investors underinvesting in this kind of stocks. Consequently, stocks are relatively cheaper and have higher expected returns (religious mutual funds typically implement this kind of SR strategies).

[10] As Chegut et al (2011) report, the topic of survivorship bias is worthy of vigilance. In fact, this bias could lead to inaccurate results in financial performance analyses.

[11] This method consists of two steps: i) Firstly, they aggregate the TNAs of the different share classes of a given fund; ii) Secondly, for fund returns, they take the weighted average of this variable using the one-month lagged TNAs of the individual share classes as the weights.

[12] SocialFunds.com features over 10,000 pages of information on SRI mutual funds, community investments, corporate research, shareowner actions and daily social investment news, and is the largest personal finance site devoted to socially responsible investing. For further information: http://www.socialfunds.com/

[13] Although we also can find some exceptions such as *Capstone Steward Small-Mid Cap Enhncd Index Fd* or *MMA Praxis mutual funds family* that implement some positive screens despite their religious nature.

[14] Such as: Christian mutual funds (excluding firms which in any way promote or support abortion, companies whose policies are judged to be anti-family, such as companies which produce or distribute pornography or whose policies undermine the sacrament of marriage, etc), or Islamic mutual funds (excluding firms from the pork products sector, conventional financial services such as banking or insurance, etc). In appendix 1 of Ferruz et al. (2011), we can find additional evidence about this assumption.

[15] A broader explanation about these matching procedures and the algorithm used to calculate the distance could be found in the original work of Bollen (2007), p. 700.

[16] One month US Treasury-Bills have been considered as the variable representative of the risk-free asset

[17] Taking into account the characteristics of our sample of funds (domestic equity mutual funds of the US market), the market benchmark used includes stocks of the New York Stock Exchange (NYSE), the American Stock Exchange (AMEX) and the Nasdaq Stock Exchange (NASDAQ)

[18] All this information was obtained from the Kenneth French website: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/

[19] The slight differences that the reader could find for the results obtained from the religious portfolio in this work and the results shown in Ferruz et al. (2011) are caused by the differences in the sample of religious mutual funds employed. Some religious mutual funds considered in Ferruz et al. (2011) have been included in this work in the sample of positive screens mutual funds, since we have detected that these funds at least consider 1 positive screen. We have made this decision since the main aim of the present article is to analyze the effect of positive screen on financial performance.

[20] In order to carry out the timing analyses, we remove from our sample (from which we build the three types of SR portfolios) several mutual funds, given that they are index funds. An index fund by definition does not involve active management, so its consideration in the analyses could bias the results of timing abilities.

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Table 1: Summary Statistics on "Positive Screens", "Negative Screens" and "Religious" equally-weighted and size-weighted portfolios

Panel A: Equally-weighted portfolios			
Portfolio	**Return (%)**	**Standard Deviation (%)**	**Nº of Funds**
Positive Screens Portfolio	0.3846	4.6180	39
Negative Screens Portfolio	0.2265	4.2887	10
Religious Portfolio	0.3053	4.5494	43
Panel B: Size-weighted portfolios			
Positive Screens Portfolio	0.3763	4.6964	39
Negative Screens Portfolio	0.2040	4.4506	10
Religious Portfolio	0.3078	4.3499	43

Table 1 comprises Panel A and Panel B. Panel A shows summary statistics for Positive Screens, Negative Screens and Religious, equally weighted-portfolios. The information shown is the mean return and Standard Deviation of these portfolios in the sample period from January 1994 to September 2010.

Panel B shows the same information as panel A but for size-weighted portfolios.

Table 2: Summary Statistics for Conventional matched-pair funds equally-weighted portfolios

Portfolio	**Return (%)**	**Standard Deviation (%)**	**Nº of Funds**
Conventional Portfolio for Positive Screens Portfolio	0.4780	4.6520	105
Conventional Portfolio for Negative Screens Portfolio	0.4250	4.4333	24
Conventional Portfolio for Religious Portfolio	0.4366	4.4822	110

Table 2 shows summary statistics for Conventional matched-pair equally-weighted portfolios for Positive Screens, Negative Screens and Religious, equally weighted-portfolios. The information shown is the mean return and Standard Deviation of these portfolios in the sample period from January 1994 to September 2010.

Table 3: 4-factor Carhart model on equally-weighted portfolios

Portfolio	α	β	SMB	HML	MOM	R-squared
Positive Screens Portfolio	-0.001 (0.285)	0.947*** (0)	0.078** (0.013)	0.082*** (0)	-0.040** (0.012)	0.967
Matched Pair non-ethical portfolio for Positive Screens SR portfolio	0.000 (0.587)	0.981*** (0)	0.098*** (0)	0.114*** (0)	0.012 (0.353)	0.980
Negative Screens Portfolio	-0.002*** (0.004)	0.833*** (0)	0.068* (0.062)	0.124*** (0)	-0.026 (0.222)	0.954
Matched Pair non-ethical portfolio for Negative Screens SR portfolio	-0.001 (0.283)	0.896*** (0)	0.132*** (0)	0.182*** (0)	-0.021 (0.339)	0.942
Religious portfolio	-0.001** (0.017)	0.943*** (0)	0.080** (0.018)	0.024 (0.313)	0.020 (0.208)	0.964
Matched Pair non-ethical portfolio for Religious portfolio	-0.001 (0.392)	0.933*** (0)	0.125*** (0)	0.135*** (0)	0.010 (0.274)	0.963

Table 3 shows the results reached when the 4-factor Carhart model is applied to equally-weighted portfolios described in data. The information shows the value of the estimated coefficients along with their associated p-value between brackets. Coefficient α represents the 4-factor-adjusted return of the portfolio; β represents the sensitivity of the funds to the market benchmark; β_{SMB}, β_{HML} and β_{PR1YR} show the sensitivity of the funds analyzed to size, book-to-market and momentum at 1 year styles respectively. R^2 shows the explanatory power of the model. *** Significant at 1%; ** Significant at 5% and * Significant at 10%.

Table 4: 4-factor Carhart model on Size-weighted portfolios

Portfolio	α	β	SMB	HML	MOM	R-squared
Positive Screens Portfolio	-0.001 (0.283)	0.951*** (0)	0.089** (0.016)	0.115*** (0)	-0.049** (0.015)	0.946
Negative Screens Portfolio	-0.002*** (0)	0.917*** (0)	0.026 (0.35)	0.098*** (0)	-0.056*** (0.001)	0.972
Religious Portfolio	-0.001* (0.059)	0.898*** (0)	0.052* (0.064)	0.045** (0.029)	-0.018 (0.201)	0.964

Table 4 shows the results reached when the 4-factor Carhart model is applied to size-weighted portfolios described in data. The information shows the value of the estimated coefficients along with their associated p-value between brackets. Coefficient α represents the 4-factor-adjusted return of the portfolio; β represents the sensitivity of the funds to the market benchmark; β_{SMB}, β_{HML} and β_{PR1YR} show the sensitivity of the funds analyzed to size, book-to-market and momentum at 1 year styles respectively. R^2 shows the explanatory power of the model. *** Significant at 1%; ** Significant at 5% and * Significant at 10%.

Table 5: 4-factor Carhart model on different temporary samples

Panel A: January 1994 to April 2002						
Portfolio	**α**	**β**	**SMB**	**HML**	**MOM**	**R-squared**
Positive Screens Portfolio	0.000 (0.881)	0.939*** (0)	0.061* (0.083)	0.107*** (0.003)	-0.052** (0.029)	0.949
Negative Screens Portfolio	-0.002* (0.069)	0.899*** (0)	0.074** (0.042)	0.200*** (0)	-0.073* (0.056)	0.940
Religious Portfolio	-0.002* (0.074)	0.980*** (0)	0.073** (0.049)	0.061* (0.082)	0.008 (0.759)	0.941
Panel B: May 2002 to September 2010						
Portfolio	**α**	**β**	**SMB**	**HML**	**MOM**	**R-squared**
Positive Screens Portfolio	-0.002*** (0.002)	0.963*** (0)	0.205*** (0)	-0.055*** (0.006)	-0.036* (0.064)	0.989
Negative Screens Portfolio	-0.002*** (0.001)	0.933*** (0)	0.165*** (0)	-0.045 (0.227)	0.024 (0.103)	0.986
Religious Portfolio	-0.001*** (0.003)	0.920*** (0)	0.171*** (0)	-0.023 (0.326)	0.023* (0.058)	0.990

Table 5 comprises Panel A and B. Panel A shows the results reached when the 4-factor Carhart model is applied to equally-weighted portfolios described in data for the period from January 1994 to April 2002. The information shows the value of the estimated coefficients along with their associated p-value between brackets. Coefficient α represents the 4-factor-adjusted return of the portfolio; β represents the sensitivity of the funds to the market benchmark; β_{SMB}, β_{HML} and β_{PR1YR} show the sensitivity of the funds analyzed to size, book-to-market and momentum at 1 year styles respectively. R^2 shows the explanatory power of the model. Panel B shows the same information as A but for the period from May 2002 to September 2010. *** Significant at 1%; ** Significant at 5% and * Significant at 10%.

Table 6: Intensity of Positive Screens

Portfolio	α	β	SMB	HML	MOM	R-squared
4 Positive Screens Portfolio	-0.001 (0.128)	0.956*** (0)	0.039 (0.174)	0.024 (0.241)	-0.023 (0.129)	0.968
Under 4 Positive Screens Portfolio	0.001 (0.646)	0.887*** (0)	0.267*** (0.001)	0.377*** (0)	-0.119*** (0.002)	0.855
Positive Screens portfolio	-0.001 (0.285)	0.947*** (0)	0.078** (0.013)	0.082*** (0)	-0.040** (0.012)	0.967

Table 6 shows the results when the 4-factor Carhart model is applied to the different portfolios built for controlling by intensity of positive screens. Coefficient α represents the stock-picking abilities; β represents the sensitivity of the funds to the market benchmark; β_{SMB}, β_{HML} and β_{PR1YR} show the sensitivity of the funds analyzed to size, book-to-market and momentum at 1 year styles respectively; R^2 shows the explanatory power of the model. *** Significant at 1%; ** Significant at 5% and * Significant at 10%.

Table 7: Timing analyses on SR portfolios

Portfolio	α	β	SMB	HML	MOM	γ	R-squared
Positive Screens Portfolio	-0.001 (0.516)	0.943*** (0)	0.092*** (0.005)	0.088*** (0.001)	-0.037** (0.029)	0.003 (0.992)	0.962
Negative Screens Portfolio	-0.003*** (0.004)	0.876*** (0)	0.081* (0.055)	0.153*** (0)	-0.005 (0.855)	0.197 (0.261)	0.941
Religious Portfolio	-0.002** (0.013)	0.945*** (0)	0.085** (0.015)	0.023 (0.342)	0.023 (0.152)	0.110 (0.455)	0.963

Table 7 shows the results from the 4-factor Carhart model extended in order to control market timing abilities (Treynor & Mazuy model). We implement expression 3 on the three types of SR equally-weighted portfolios considered in the work. Coefficient α represents the stock-picking abilities; β represents the sensitivity of the funds to the market benchmark; β_{SMB}, β_{HML} and β_{PR1YR} show the sensitivity of the funds analyzed to size, book-to-market and momentum at 1 year styles respectively; Coefficient γ represents the market timing abilities. R^2 shows the explanatory power of the model. *** Significant at 1%; ** Significant at 5% and * Significant at 10%.

Appendix 1: SR mutual funds which implement at least 1 positive screen

Mutual fund name
Appleseed Fund
Ariel Appreciation Fund
Ariel Focus Fund
Ariel Fund
Calvert Aggressive Allocation Fund
Calvert Capital Accumulation Fund
Calvert Enhanced Equity Portfolio
Calvert Equity Portfolio
Calvert Large Cap Growth Fund
Calvert Mid Cap Value Fund
Calvert New Vision Small Cap Fund
Calvert Small Cap Value Fund
Calvert Social Index Funds
Calvert World Cap Acc
Capstone Steward Small-Mid Cap Enhncd Index Fd
Domini Social Equity Fund
Green Century Equity Fund
MMA Praxis Core Stock Fund
MMA Praxis Growth Index Fund
MMA Praxis Small Cap Fund
MMA Praxis Value Index Fund
Neuberger Berman Socially Responsive Fund
Parnassus Equity Income Fund
Parnassus Fund
Parnassus Mid-Cap Fund
Parnassus Small-Cap Fund
Parnassus Workplace Fund
Pax MSCI North America ESG Index ETF
Pax World Growth Fund
Pax World Small Cap
Pax World Value Fund
Pax World Women's Equity Fund
Sentinel Sustainable Core Opportunities Fund
Sentinel Sustainable Emerging Companies Fund
Sentinel Sustainable Emerging Growth Opptys Fund
TIAA-CREF Social Choice Equity Fund
Walden Small Cap Innovations Fund
Walden Social Equity Fund
Winslow Green Growth Fund

Appendix 2: SR mutual funds which implement negative screens

Fund name
Epiphany Faith & Family Values 100 Fund
Epiphany FFV Focused Fund
Epiphany Large Cap Core Fund
Eventide Gilead Fund; Retail
Integrity Growth & Income Fund
LKCM Aquinas Growth Fund
LKCM Aquinas Small Cap Fund
LKCM Aquinas Value Fund
New Covenant Growth Fund
Vanguard FTSE Social Index Fund

Appendix 3: Religious mutual funds

Mutual Fund Name
Allied Asset Advisors Iman Fund
Amana Growth Fund
Amana Income Fund
American Trust Allegiance Fund
Ave Maria Catholic Values Fund
Ave Maria Growth Fund
Ave Maria Opportunity Fund
Ave Maria Rising Dividend Fund
Azzad Ethical Mid Cap Fund
CAMCO Investors Fund
Catholic Equity Fund
Centurion Christian Values Fund
Dominion Shepherd Large Cap Growth Fund
Epiphany Faith & Family Values 100 Fund
Epiphany FFV Focused Fund
Epiphany Large Cap Core Fund
Eventilde Gilead Fund; Retail
FaithShares Baptist Values Fund
FaithShares Catholic Values Fund
FaithShares Christian Values Fund
FaithShares Lutheran Values Fund
FaithShares Methodist Values Fund
GuideStone Capital Opportunities Fund GS8
GuideStones Equity Index Funds
GuideStone Growth Allocation Fund
GuideStone Growth Equity Fund
GuideStone Small Cap Equity Fund
GuideStone Value Equity Fund
Integrity Growth & Income Fund; A
iShares KLD 400 Social Index Fund
iShares KLD Select Social Index Fund
LKCM Aquinas Growth Fund
LKCM Aquinas Small Cap Fund
LKCM Aquinas Value Fund
New Covenant Growth Fund
Steward Large Cap Enhanced Index Fund
Steward Multi-Manager Equity Fund
Timothy Plan Aggressive Growth Fund
Timothy Plan Conservative Growth Fund
Timothy Plan Large/Mid-Cap Growth Fund
Timothy Plan Large/Mid-Cap Value Fund

Timothy Plan Small Cap Value Fund
Timothy Plan Strategic Growth Fund