GREEN AND GOOD?
THE INVESTMENT PERFORMANCE OF US ENVIRONMENTAL MUTUAL FUNDS

FRANCISCO J. CLIMENT-DIRANZO
PILAR SORIANO-FELIPE

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The investment performance of US environmental mutual funds

Francisco J. Climent-Diranzo*

Pilar Soriano-Felipe*

Abstract

Increased concern for the environment has increased the number of investment opportunities in mutual funds specialized in promoting responsible environmental attitudes. This paper examines the performance and risk sensitivities of US green mutual funds vis-à-vis their conventional peers. We also analyze and compare this performance relative to other Socially Responsible Investing (SRI) mutual funds. In order to implement this analysis, we apply a CAPM-based methodology and find that in the 1987-2009 period, environmental funds had lower performance than conventional funds with similar characteristics. Green funds achieved risk-adjusted returns not significantly different from the rest of SRI mutual funds.

Key words: Socially responsible investments; Mutual funds; Performance evaluation; Ethical investing; Corporate social responsibility.

JEL Classification: F30; G11; G15; G23; M14

Corresponding author: Pilar Soriano, Department ofFinancial Economics, Faculty of Economics, University of Valencia (46022), Spain. Email: Pilar.Soriano-Felipe@uv.es.
* Department of Financial Economics, Faculty of Economics, University of Valencia

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1. Introduction

Socially Responsible Investment (SRI) funds are not new in the marketplace, but in recent years, we have seen an increase in interest in them, specifically with respect to funds that seek environmentally responsible investments (green funds).

According to the Social Investment Forum, about one out of every nine dollars under professional management in the United States in 2007 was involved in socially responsible investing. In particular, assets in all types of socially and environmentally screened funds (including mutual funds, exchange traded funds (ETFs), closed-end funds, other pooled products, and alternative investments) rose to $201.8 billion in 2007. The largest share of socially and environmentally screened funds are mutual funds, with $171.7 billion in total net assets.

SRI integrates - apart from the financial criteria - social, environmental and/or ethical criteria into the processes of analysis, selection, and choice of investment. Therefore one could classify SRI funds according to the different criteria used in their composition into a more specific group of funds: religious funds, green funds, human rights funds,…
A growing concern about climate change and its risk for portfolios is intensifying the interest in SRI. In fact, climate change is now widely recognized as the most significant environmental issue facing the global economy. Therefore, investor demand is growing for portfolio opportunities in clean and green technology, alternative and renewable energy, green building and responsible property development, and other environmentally driven businesses (SIF, 2007).

However, environmental issues have received relatively limited attention in the finance literature, except as part of the more general literature on SRI.

The academic community has displayed considerable interest in the analysis of SRI investment performance. However, aggregate measures of SRI do not differentiate existing relationships between individual dimensions of SRI and returns. According to Galema et al.(2008), one of the reasons why the empirical literature yields few significant relations between SRI and expected returns may be due to the aggregation over different dimensions that have confounding effects. For example, it is possible that positive news on environmental friendly production is positively related to expected returns, whereas news pertaining to good employee relations is negatively related. Therefore, we will focus on a specific dimension of responsibility: environment. Undoubtedly, the contribution of each individual social investment criterion to fund return is an interesting empirical question.

In relation to SRI investment, Hamilton et al. (1993) tried to answer an important question: Could we be doing well while doing good? They presented three alternative hypothesis about the relative returns of SRI portfolios and conventional ones. The first hypothesis is that the expected returns of SRI portfolios are equal to expected returns of conventional portfolios. This is consistent with the idea that social responsibility is not priced. The second hypothesis is that the expected returns of SRI portfolios are lower than the expected returns of conventional portfolios. This would imply that the market prices the social responsibility characteristic. Finally, the third and last hypothesis is that the expected returns of SRI portfolios are higher than the expected returns of conventional portfolios. This would imply “doing well while doing good”. We will also try to answer this question in relation to environmental mutual funds.

When analyzing the financial performance of green or environmental funds, one should not forget about the importance of the industry factor. Some industries (such as mining, oil and gas) may be underweighted and other (utilities) overweighted in this kind of funds, and therefore performance biased. It is likely that the constituent assets of environmental funds are highly concentrated within certain industries, and this fact should be taken into account in the analysis. Moreover, restricting the investment set may reduce the ability to reduce risk through diversification. In fact, standard portfolio choice theory would suggest that the constraint implied by environmental selection would imply lower performance. However, this is not always the case, as SRI funds may be able to generate good risk-adjusted returns.

Environmentalists seeking to match their principles with their investment will most likely invest in environmental funds, regardless of returns. However, as Statman (2000)
points out, “socially responsible investors want to do well, not merely do good”. They want socially responsible mutual funds with a risk/return combination similar to that of conventional funds. Our study will investigate whether a long-run premium or penalty exists for holding environmentally responsible mutual funds. This is, we will focus exclusively on the environmental element of social responsibility.

The remainder of the article is organized as follows. Next, we present a literature review. In the data section, we describe the mutual fund data set we use in our analysis. The fourth section discusses the empirical methodology we use in order to measure and compare mutual fund performance. Empirical results are presented in the fifth section and, finally, in section six we make some concluding remarks.

2. Literature review

Studies related to SRI could be classified into two broad branches: those that analyze it from a behavioral point of view and those that analyze its financial efficiency through different performance measures as compared to other financial alternatives. Our study would fit in this second strand of the literature. In general, these studies reach the conclusion that SRI efficiency does not differ much from that of other types of investment.

Galema et al. (2008) provide an interesting theoretical discussion on SRI and performance.Most previous empirical studies compare the average performance of SRI and conventional funds in the US[*]. Nevertheless, this

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[*] See, for instance, White (1995), Statman(2000), Derwall et al. (2005), Benson et al. (2006), Kempf and

analysis has also been conducted in other international markets such as UK, Canada or Spain[†]. Earlier studies used to compare fund performance with either SRI or general indexes (see White, 1995), while more recent studies tend to evaluate fund performance with the so-called matched-pair analysis (see Mallin et al., 1995).

As stated before, comparative studies between SRI and traditional investment lead to the fact that an ethical, ecological and/or socially responsible positioning is not incompatible with profitability. In fact, some studies find that SRI funds have better performance than conventional funds with similar characteristics (see Kempf and Osthoff (2007), Galema et al. (2008), Fernandez and Matallin (2008) or Gil-Bazo et al. (2010)).

There are also empirical papers analyzing those particular factors that might have an influence on performance (for instance, fund's age, size or fees). Kreander et al. (2005) find that management fee is a significant explanatory variable for the Jensen measure[‡], while Benson et al. (2006) find no difference in fee levels nor managerial stock-picking skills between SRI and non-SRI funds. Therefore, there seems to be consensus in the fact that some factors such as age and size should be taken into account when comparing mutual fund performance. However, there is not a consensus yet on the effect of other factors. Benson et al. (2006) also point out differences in industry composition. If this factor had an effect on performance, we could see it through the analysis of a particular type of SRI funds: environmental funds. These funds will usually have a particular industry composition that will differentiate them from the rest of SRI funds. For instance, they might have a stronger weight on the natural resources or renewable energy industries.

As mentioned above, previous research on SRI mutual funds has focused on determining whether SRI funds have different financial performance than conventional funds. Diltz (1995) examined various dimensions of SRI for the US

Osthoff (2007), Galema et al. (2008), Gil-Bazo et al. (2010) or Derwall and Koedijk (2009).

[†] See, respectively, Gregory et al. (1997), Bauer et al. (2007) and Fernandez and Matallin (2008).

[‡] See the methodology section for a definition of the measure.

stock market. The paper found that employing environmental and military screens leads to a significantly positive performance, while all other screens do not have a significant impact on performance. Therefore, one might think that focusing in a subsample of the so-called SRI funds might give an insight into what is really happening with performance. In this paper, we contribute to the debate on the performance of SRI funds by identifying and separately addressing environmental funds.

As far as we know, White (1995) is the only previous paper to compare environmental funds with both SRI investment and conventional investment. They find that, during 1990-1993, US investors in environmental mutual funds earned inferior risk-adjusted returns vis-à-vis both the overall US market (proxied through the S&P500) and a counterpart index of US socially-responsible firms (proxied through the Domini index). However, German green funds fared better, achieving risk-adjusted returns not significantly different from the overall German stock market. In a similar attempt, Derwall et al. (2005) constructed and evaluated two US equity portfolios that differed in eco-efficiency. The high-ranked portfolio provided substantially higher average returns than its low-ranked counterpart over the 1995-2003 period. Therefore, there seems to be very scarce and puzzling evidence on environmental portfolios performance.

In this paper, we shed light on the debate about the financial performance of socially responsible investment mutual funds by particularly focusing on environmental funds.

It might be the case that some SRI funds owe their success/failure more to standard investment techniques (smaller firms, higher beta coefficients,…) than to a particular ethical screening technique. Therefore, we should not underestimate the importance of fund characteristics such as company size, age, managers, style, country, industry or investment universe, when comparing green versus SRI or conventional funds. All these biases can be corrected by comparing green versus SRI funds or conventional funds through a matched-pair analysis.

As far as we know, this is the first paper to analyze environmental mutual funds performance using a matched-pair analysis. The current paper extends previous research in a number of ways. First, it focuses on environmental funds rather than more general SRI funds. Second, it compares their performance with both conventional funds and SRI funds through a matched-pair analysis. Finally, we will focus on US mutual fund data for the 1987-2009 period. This includes the last decade, where socially responsible investing is thriving in the US, growing at a faster pace than the broader universe of all investment assets under professional management. Our results seem to show that investing in environmental funds comes at the cost of reduced performance.

3. Data

We evaluate green fund performance relative to matched samples of SRI and conventional funds. Each green mutual fund is matched against an equally weighted portfolio of four conventional funds using fund age, end-of-period fund size, and investment objective as matching criteria. Similarly, each green mutual fund is matched against an equally weighted portfolio of two SRI funds using fund age and end-of-period fund size as matching criteria. We are less restrictive and use fewer funds in this case because the total population of SRI funds is smaller. In using these criteria, we control for the potentially interfering influence of, respectively, fund age, fund size, and investment scope. We select four (two) funds to compose the matched sample of conventional (SRI) funds, instead of one fund, in order to mitigate the problem that mutual funds are not entirely equal in terms of the size criterion. This discrepancy averages out. The fund data are primarily from the CRSP US Mutual Fund database and cover the period 1987:03–2009:12.

Mutual fund data

Our mutual fund sample consists of US green, SRI and conventional mutual funds with open-ended equity orientation only. Hence, we exclude bond, balanced and guaranteed funds. We also exclude index funds, institutional funds and funds less than 12-months of age from our sample.

Our main source of data is the CRSP Survivor-Bias Free US Mutual Fund Database. From there, we obtain monthly information on returns and other fund characteristics. We will analyze after-fee performance, which is the normally reported performance (net of fund expenses).

In the CRSP dataset, different classes of the same fund appear as different funds. Following Statman (2000), we included only the first-established class fund. We chose the class fund with the most assets if two or more class funds were established simultaneously.

We obtain our list of green and SRI funds from Bloomberg[§]. At the end of our sample period, 10 US open-ended funds are classified as environmentally friendly funds and 27 funds are classified as Socially Responsible Investment. Only 7 out of the 10 green funds have more than one year age so that they can be included in our final sample. From the 27 SRI funds, only 19 are retail funds. SRI funds do not include those classified by Bloomberg as environmentally-friendly focused.

Looking at some basic features of green, SRI and conventional mutual funds, we observe that the average green fund is typically smaller in size (133 millions of US dollars) than SRI (208) and conventional (406) funds. Expense ratios are lower in green funds (1.39) than in both SRI (1.77) and conventional (1.58) funds. Furthermore, as indicated by the number of years a fund exists, nowadays we can find green, SRI and conventional funds of similar characteristics (10.6, 12.5 and 9.75 average years respectively).

[§] We considered obtaining this list/classification from other sources such as Lipper or Morningstar. However, other classifications were too vague when defining "green funds". Bloomberg's definition was the most concrete one. All funds considered as "environmentally-friendly" by Bloomberg where included in the other lists. We preferred to use a more restrictive classification in order to be sure of the pureness of our data.

To account for the possible return differences between green mutual funds and SRI and conventional funds, we compare the performance of green funds with a matched sample of SRI and conventional funds using fund age, size and investment objective as matching criteria. For each green fund we develop a matched sample containing four (two) appropriate conventional (SRI) funds. Our final sample of actively managed, retail, US, equity mutual funds in the 1987-2009 period contains a total of 7 green funds, 14 matched SRI funds and 28 matched conventional funds. Subsequently, we compute the equal-weighted returns of all funds in our matched samples.

Table I reports summary statistics pertaining to our matched mutual fund portfolios. Over the entire sample period, the average green fund earned a lower average annualized return than its conventional counterpart: 8.45% versus 12.67%. Corresponding standard deviations (17.56% and 15.05%) suggest that green funds were also more risky. The average return on the green portfolio was higher for this particular sample period (8.45%) compared to the average SRI fund return (7.19%), but the return variability was substantially higher as well (17.56% versus 13.79%).

TABLE I

Summary statistics on green versus matched SRI and conventional funds 1987-2009

Portfolio	Return	Standard Deviation	# Funds
Green	8.45%	17.56%	7
SRI	7.19%	13.79%	14
Conventional	12.67%	15.05%	28

Factor benchmarks

Stock market performance in the US will be measured relative to the Standard and Poor's 500 Index (S&P500), FTSE KLD 400 Social Index (KLD400), and the FTSE KLD Global Climate 100 Index (GC100). We used KLD indexes because they give us the longest time horizon so far. Moreover, KLD indexes allow us to investigate environmentally friendly performance through an exclusively green index. The KLD400 is a float-adjusted, market capitalization-weighted, common stock index of US equities launched by KLD in May 1990. The KLD400 (formerly KLD's Domini 400 Social Index) is the first benchmark index constructed using environmental, social and governance factors. It is a widely recognized benchmark for measuring the impact of social and environmental screening on investment portfolios. Similarly, the GC100 is a specialty index that promotes investment in 100 public companies that demonstrate the greatest potential for mitigating immediate and long-term causes of climate change.

As we will explain above, in order to estimate multifactor models in the spirit of Carhart (1997), we will need factor portfolios using all US stocks in the CRSP database. These factors are (1) the excess market return, (2) the return spread between a small cap portfolio and a large cap portfolio, (3) the difference in return between a value stock portfolio and a growth stock portfolio, and (4) a momentum factor. These factors are also obtained from the CRSP Survivor-Bias Free US Mutual Fund Database.

4. Methodology

In order to estimate performance differences between SRI funds and a matched sample of comparable conventional funds, earlier studies compare either means of groups or use the so-called matched-pair analysis. We will use the last approach. Therefore, in order to investigate whether investors pay a price for environmentally-friendly strategies, we examine the risk and return characteristics of green mutual funds and compare them to reference groups of SRI and conventional funds.

We study the performance of green, SRI and conventional funds by using the time-series returns of an equally weighted portfolio of funds. We evaluate the performance of the fund portfolios on a US basis from a local investor perspective: the country portfolios of mutual funds are in US dollars, evaluated against US benchmark factors while using local risk-free interest rates.

Risk-adjusted returns are the appropriate standard of comparison for evaluating investment alternatives. The academic literature has proposed different performance measures. Among them, the most successful ones have been the Treynor (1965), Sharpe (1966), and Jensen (1968) measures.

The Jensen's alpha measures a fund's outperformance through the difference between the return on the mutual fund and the return on the single-factor benchmark according to an estimated CAPM.

Formally, we would estimate the following 1-factor model:

$$r_t - r_{f,t} = \alpha + \beta_{MKT}(r_t^m - r_{f,t}) + \eta_t \tag{1}$$

where r_t is the return on an equally weighted portfolio of funds in month t, $r_{f,t}$ is the return on a local risk-free deposit, r_t^m is the return of a local market proxy, α is the 1-factor-adjusted return of the fund, β_{MKT} measures the fund's market-risk exposure, and η_t stands for the idiosyncratic return.

However, it has been repeatedly argued that this 1-factor model is insufficiently able to explain the cross-section of expected stock returns. Therefore, most recent empirical studies use extended versions of that model. In particular, we will use the Carhart (1997) four-factor model[**]. This model will provide us the main results of our analysis. Other simpler 1-factor models will also be considered as a robustness check.

We estimate a four-factor model that includes the market, size (*SMB*), book-to-market (*HML*), and momentum (*MOM*) factors (see Fama and French (1993)

[**] Other fund performance measures can be found in Chen and Knez (1996), Ferson and Schadt (1996), Elton et al (1999), Bollen and Busse (2005), or Kosowski et al (2006).

and Carhart (1997)) to control for the impact of investment styles on performance:

$$r_t - r_{f,t} = \alpha + \beta_{MKT}(r_t^m - r_{f,t}) + \beta_{SMB} r_t^{smb} + \beta_{HML} r_t^{hml} + \beta_{MOM} r_t^{mom} + \eta_t \quad (2)$$

where r_t is the return on an equally weighted portfolio of funds in month t, $r_{f,t}$ is the return on a local risk-free deposit, r_t^m is the return of a local market proxy, r_t^{smb} , r_t^{hml}, and r_t^{mom} are the SMB, HML and MOM factors, α is the four-factor-adjusted return of fund portfolios, β_{MKT} , β_{SMB} , β_{HML} , and β_{MOM} are the factor loadings on the four factors, and η_t stands for the idiosyncratic return.

The hypotheses to be tested are whether there are or not differences in performance (alpha) and in exposure to market (betas) between green, SRI and conventional mutual funds.

5. Results

Table II presents the results of applying Equation (1) on our matched samples of portfolios of green, SRI and conventional funds. The market proxy is measured by a value-weighted portfolio from the CRSP database. We compute Jensen's alpha for the three portfolios and, to enhance comparability, we also evaluate two "difference" portfolios, which are constructed by respectively subtracting SRI and conventional fund returns from green fund returns. These portfolios serve to examine differencesin risk and return between the different investment approaches. Therefore, we implicitly attribute differences in the risk-adjusted average performancebetween green funds and SRI/conventional funds to environmental screens.

TABLE II

Empirical results for 1-factor regressions

Portfolio	α	β	Adj. R^2
Green (1)	-3.20(-1.42)	0.99(20.63)***	0.76
SRI (2)	-1.53(-1.76)*	0.84(27.75)***	0.94
Conventional (3)	1.02(0.88)	0.91(25.74)***	0.92
Differences			
(1)-(2)	-1.67(-0.88)	0.16(4.01)***	0.07
(1)-(3)	-4.22(-2.42)**	0.08(2.23)**	0.02

From Table IIseveral conclusions can be drawn. First, we find no statistically significantdifference in performance (alpha) between green and SRI mutualfunds. The alpha estimates for the “difference”portfoliois insignificant. However, we do find statistically significant difference in performance between green and conventional mutual funds. The results indicate that green funds on average underperform conventional funds by 4.22%.Second, as indicated by differences in exposure to market betas, greenfunds tend to be more market sensitive than both their SRI and conventional counterparts.

We ran several alternative specifications of Equation (1). For instance, in Table III we ran a specification in which we replaced the CRSPmarket proxy by the S&P500 index. The alphas obtained for the three portfoliosdiffered from the previous results. However, the alphas obtained for the “difference” portfolios differed only marginally from the previous results. This is, results still indicate that green funds on average underperform conventional funds, whereas there is no statistical difference between green and SRI performance.

TABLE III

Empirical results for 1-factor regressions (S&P500)

Portfolio	α	β	Adj. R^2
Green (1)	-0.74(-0.30)*	0.97(16.58)***	0.67
SRI (2)	0.44(0.40)	0.85(24.82)***	0.90
Conventional (3)	3.19(2.31)**	0.91(22.44)***	0.86
Differences			
(1)-(2)	-1.17(-0.61)	0.12(2.63)***	0.04
(1)-(3)	-3.93(-2.36)**	0.06(1.37)	0.01

Since the investment universe of green mutual fund managers is determined by environmental screens, the single-factor regression of excess green fund returns on a standard equity index may lead to biased estimates of mutual fund performance. Therefore, it is useful to consider a relevant environmental equity index to measure the performance of green mutual funds. We repeated our computations but now using the return on the FTSE KLD Global Climate 100 Index as the determinant in the single-factor model. As theFTSE KLD Global Climate 100 Index was introduced only recently, we are only able to estimate Jensen’s alpha using monthly green index returns for the period 2005–2009.

We also run a similar single-index regression using data from a broad SRI index as the market proxy. In particular, we used the KLD400(formerly KLD's Domini 400 Social Index), from which we could obtain data for the period 1990-2009.

Results can be found in Tables IV and V, respectively. With regard to the green fund portfolio, the estimated alpha is negative and not statistically significant at the usual cut-off levels. The results therefore point out that green mutual funds are not able to outperform their ethical index. As expected, the adjusted R-squared from the model with the green index is higher (0.92) than the R-squared from the standard single-index model (0.76) or from the model with the

SRI index (0.59), indicating that the green index is more capable of explaining green mutual fund performance than both standard or SRI equity indexes. Equally remarkable are the fund betas, which reveal that the green fund portfolio is more exposed to green and standard market indexes (β= 1.00 and β = 0.99) than to the SRI index (β = 0.89). These findings could be partly explained by the fact that the SRI index comprises only 400 stocks, whereas the conventional index represents a larger stock universe.Using an environmental index as the market proxy, there would be no significant difference between green funds performance and SRI/conventional funds performance. Using an SRI index as the market proxy, green funds underperform relative to conventional funds.

TABLE IV

Empirical results for 1-factor regressions using a green equity index

Portfolio	α	β	Adj. R^2
Green (1)	-3.61(-1.45)	1.00(15.51)***	0.92
SRI (2)	3.38(-1.22)	0.74(18.56)***	0.87
Conventional (3)	-2.68(-0.90)	0.82(16.85)***	0.88
Differences			
(1)-(2)	-0.22(-0.07)	0.26(5.51)***	0.49
(1)-(3)	-0.93(-0.35)	0.18(5.53)***	0.35

TABLE V

Empirical results for 1-factor regressions using a SRI equity index

Portfolio	α	β	Adj. R^2
Green (1)	-3.8(-1.21)	0.89(11.91)***	0.59
SRI (2)	-2.10(-1.57)	0.83(22.95)***	0.88
Conventional (3)	0.86(0.47)	0.84(16.86)***	0.81
Differences			
(1)-(2)	-1.69(-0.76)	0.06(1.23)	0.01
(1)-(3)	-4.66(-2.31)**	0.05(1.23)	0.01

Finally, Table VI summarizes the results of estimating the Carhart (1997) multi-factor model. First, we noticean increase in average adjusted R-squared for the multi-factor models, compared to the 1-factorCAPM models. This confirms our expectation that multifactor models are superiorin explaining mutual fund returns. Second, green funds tend to have more exposureto the market portfolio in comparison to both SRI and conventional funds, which corroborates our previous 1-factor results. Third, green funds are heavily exposedto small caps, as compared with SRI and conventional funds. Fourth, green funds do not have a significantly different exposure to the value style (HML) and momentum factor (MOM) than SRI and conventional funds. Finally,after controlling for market risk, size, book-to-market and momentum the differencein return between green and conventional funds remains statisticallysignificant whereas it remains statistically insignificant between green and SRI funds. Environmental funds underperform their conventional peers.

TABLE VI

Multifactor regression results

Portfolio	α	β	SMB	HML	MOM	Adj. R^2
Green (1)	-3.96(-1.99)**	0.97(22.78)***	0.36(7.07)***	0.19(2.29)**	-0.04(0.91)	0.81
SRI (2)	-1.82(-2.03)**	0.85(29,11)***	0.02(1.07)	0.08(2.70)***	-0.01(-0.64)	0.94
Conventional (3)	0.01(0.01)	0.93(3.57)***	0.14(3.32)***	0.18(4.54)***	0.003(0.15)	0.94
Differences						
(1)-(2)	-2.14(-1.22)	0.12(2.99)***	0.33(7.38)***	0.12(1.51)	-0.03(-0.71)	0.25
(1)-(3)	-3.97(-2.34)**	0.04(0.91)	0.22(5.17)***	0.01(0.21)	-0.05(-1.09)	0.12

6. Conclusions

In this paper, we analyze the question of whether US mutual funds constrained by an environmentally-friendly investment strategy underperformed or outperformed mutual funds not subject to that constraint, during 1987-2009.

In theory, environmental and SRI funds are subject to higher risks, because they limit the number of stocks in which they invest. This is probably the reason why green funds seem to show lower returns than their conventional peers. This would imply that the market prices the environmental responsibility characteristic. Maybe, the question should not be does being green pay, but when, who and in which sense does it pay? As other authors have suggested, an environmentally-friendly positioning will probably imply good overall management, good reputation and future value creation by stimulating innovation. Investors might be willing to pay more for green or environmentally-friendly products in the form of lower returns as compared to conventional investments.

Our results agree with White (1995). The research question “Did it pay to be a green investor?” should be answered “No, at least in the US during 1987-2009”. However, these results may change if we only focused in a more recent sample period. We leave this subsample analysis for further research. For instance, green-orientated investments could fare better during market downturns. In addition, this study should be extended to other countries. Therefore, we should be cautious interpreting results. Our results are valid for our particular sample of funds in our particular time period.

The poor performance of environmental mutual funds could be explained by their more restricted investment set. As White (1995) points out “it may be improper to judge the returns on these funds using a broad-based measure such as the S&P500”. In fact, when we compared green and conventional fund performance using a green index as the market proxy, we found no statistically difference between returns.

Other explanations for the poor performance of green funds could be selection criteria, or poor fund management. It might also be the case that environmental funds have increased in value more quickly than conventional funds due to an increase in their demand. Therefore, a collapse of green stock prices would have impacted negatively on green funds performance.

But, why do we invest in green mutual funds? If we move away from the classical financial models, green investors could be irrational investors in the sense of not possessing a traditional utility function based on maximization of end-of-period wealth. Theories based on behavioral or sustainable finance would suggest that investors might possess a utility function based on a triple bottom-line: social, environmental and financial performance. In this sense, Fernandez and Matallin (2008) propose to use a Financial and Social Performance (FSP) measure. If the FPs of green funds were consistently inferior to those of the conventional funds we could then admit the existence of a financial sacrifice that could still be compensated by the social performance of the green/ethical investment.

All in all, one should take into account that past performance does not necessarily predict future performance. As fund managers and investors gain experience with green-orientated investment and investment opportunities increase, we may find returns approaching those obtained on conventional funds.

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