Social screening and mutual fund performance: international evidence

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Abstract

This paper investigates the relationship between the risk-adjusted performance and the screening strategies of 330 US and European equity socially responsible mutual funds over the period 2003-2014. On aggregate, the results support the argument that investors can pursue their ethical investment policies without sacrificing financial returns. For US and Scandinavian funds, we find a curvilinear relationship between screening intensity and performance: US funds exhibit an inverted U-shaped effect, while Scandinavian funds, consistent with Barnett and Salomon (2006), show a U-shaped effect. Differently, for UK funds, there is a negative linear relationship between the number of screens and returns. For the other countries, there is no significant relationship between screening and fund performance. Furthermore, the results show that the type of the screening activities of US and UK socially responsible funds have a significant impact on risk-adjusted returns. For US funds, environment and products screens negatively impact performance, whilst corporate governance contributes to performance. In turn, UK funds that screen on the basis of products have relatively stronger performance. Finally, positive screening yields lower performance the global sample and for US funds.

Keywords: Socially responsible investments, screening, financial performance, risk-adjusted performance, mutual funds,

EFM Codes: 380, 750

1. Introduction

The increasing growth of Socially Responsible Investments (SRI) around the world has led to an intense debate among academics and investors on whether there is a premium or penalty for holding socially responsible funds. Investing with ethical concerns has clearly gone from margin to mainstream, but there is yet some reluctance in embracing SRI principles, mainly because some literature does not exclude a price for ethics.

What makes a fund socially responsible? There is no single and universal definition of what criteria a mutual fund should follow to be an ethical or socially responsible fund (Dunfee,

2003). SRI funds can use different screening strategies (positive, negative, or "best-in-class") and a wide variety of criteria to filter for socially responsible companies. Ultimately, the degree of heterogeneity in the screens used by SRI funds reflects the diversity of investors' values.

Despite the heterogeneity of SRI funds, many papers treat them as a homogenous group (Ferruz *et al*., 2012). According to Galema *et al.* (2008) and Derwall *et al.* (2011), among others, one of the reasons why the empirical literature yields scarce significant relations between SRI and returns is the aggregation of different social dimensions that may have confounding effects in financial performance. In fact, Schlegelmilch (1997) metaphorically defines ethical investment as an "*umbrella term for a wide variety of products*". Since socially responsible investors typically consider a multitude of criteria that can be contradictory or even mutually exclusive (Dunfee, 2003; Kempf and Osthoff, 2007), we should focus on the heterogeneity within SRI funds.

In the academic literature, there are still few studies that investigate the impact of different screens on SRI performance. This type of studies can provide further insights on previous research that suggests that SRI funds exhibit no significant performance differences from conventional funds. According to Kinder and Domini (1997), screening is the expression of the investors' values and societal concerns in a way that allows its application in the decision-making process. Through screening, SRI funds restrict their investments to firms that are engaged in social practices in specific stakeholder-oriented issues, or to those that are not involved in socially irresponsible activities or products. The latter approach may involve the exclusion of not merely certain firms, but entire industries and even economic sectors. The selection process can thus have significant implications in the financial performance of an investment portfolio (Barnett and Salomon, 2006).

Since the screening strategies applied to SRI portfolios impose constraints to the investment universe, the risk-adjusted returns of a socially screened portfolio can be lower relatively to an unrestricted one. Nevertheless, the use of specific social screens may allow portfolio managers to identify companies with sustainable competitive advantages, reflected in improved future performance. Thus, the issue of the types of screens must be taken into account to understand whether SRI funds outperform their conventional peers, that is, if investors are "*doing well while doing good*" (Hamilton *et al*., 1993).

The analysis of the relationship between the features of the non-financial screening process and the financial performance of SRI funds will shed some light on the financial advantage (or disadvantage) of selecting socially constrained funds. This study comprises data from socially responsible mutual funds domiciled in European countries and in the US, so we

can assess geographically if there is a "*don't mix money and morality*" philosophy (Goldreyer *et al*., 1999), or if ethical and social values are financially rewarded.

In this context, the central aim of this paper is to investigate how the screening process, i.e., the number of screens and qualitative differences in the screens used, affects risk-adjusted performance, and also if the impact of the screening processes differs worldwide. The analysis of whether there are geographical differences in the impact of the screening process on SRI fund performance is relevant, considering the different patterns of SRI development around the world. In fact, several studies recognize the contextual nature of SRI and confirm regional and cultural idiosyncrasies in socially responsible investing (e.g., Louche and Lydenberg, 2006; Bengtsson, 2008; Neher and Hebb, 2016). Thus, different social concerns may vary considerably in geographic terms, especially in terms of screening strategies. As Sandberg *et al*. (2009) suggest, cultural differences might be one explanation for heterogeneity in the field of SRI.

We contribute to the mutual fund literature in several ways. To the best of our knowledge, we are the first to study to analyze the effects of the screening process in Europe and in the US. Although there are some papers in the SRI literature that explore this issue, with the exception of Renneboog *et al.* (2008b), extant evidence is geographically limited. For example, Barnett and Salomon (2006) and Lee *et al.* (2010) focus on US funds, Laurel (2011) analyze European funds, and Capelle-Blancard and Monjon (2014) restrict their investigation to French funds. And although Renneboog *et al.* (2008b) evaluate SRI fund performance for different countries worldwide, the analysis of the relation between screening and performance is performed at the aggregate level and not by region or country. Furthermore, our analysis considers the multiple dimensions of the social screening process. Previous studies include one or a few of these dimensions such as screening intensity and type of screens, screening signal (positive vs. negative), or sectoral and transversal screens. We capture all these dimensions, as well as social label certification, as part of the screening process. As far we are aware of, we are the first to integrate SRI labels as a determinant of the financial performance of SRI funds.

For US funds, our analysis shows that the number of screens has a statistically significant impact on performance, specifically an inverted U-shaped effect: funds than screen more strictly have better risk-adjusted returns until a certain extent of screens; then, the returns start to decline. On the other hand, the U-shape effect is the opposite for Scandinavia: financial performance decreases at first as the number of screens increases, but then raises continuously until it achieves the maximum screening intensity. The UK exhibits a linear negative relationship between screens and returns. In relation to our global sample, or other European

countries, we find no conclusive evidence on the impact of the number of screens on SRI fund performance.

We also find some evidence that the type of screens used impact performance of US and UK SRI funds. In particular, environment- and products-oriented US SRI funds appear to have lower returns, whereas governance-oriented US SRI funds are financially rewarded. Unlike the US, products-oriented UK SRI funds benefit from a superior financial performance.

In terms of the screening strategy, considering the global sample and the sub-sample of US funds, we find that funds which impose positive screens have worse performance. This conclusion is in line with Auer (2016) who argues that only negative screens (with low cut-off rates) allow SRI investors to be consistent with their personal values and beliefs without being forced to sacrifice performance.

Our results are relevant for several reasons. First, we obtain statistically significant empirical evidence for the US, the biggest SRI player in the world, not only concerning the screening intensity, but also the qualitative differences in the screens (types of screens and screening strategy – positive vs. negative). Second, our main findings reveal a negative linear relationship between screening intensity and financial performance for the UK, and a curvilinear (U-shaped) relationship between screening intensity and financial performance for Scandinavian countries. To our knowledge, we are the first to document conclusive results in respect to important SRI markets[1] such as the UK - a country with early roots on SRI, and Scandinavian countries, who were among the first in the world to introduce regulatory frameworks and standards to promote social responsibility activities in financial management (Sandberg *et al*., 2009). Finally, our study shows that the imposition of positive screens reduces funds' financial performance, when considering European and US funds as a whole, and US funds individually.

The remainder of the paper is organized as follows. Section 2 surveys the empirical literature. Section 3 proposes a set of testable hypotheses and section 4 describes the data used in the study. The methodology is outlined in section 5. The empirical results are presented and discussed in section 6. Section 7 summarizes the main results and presents some concluding remarks.

[1] Biehl and Hoepner (2010) also find a negative relationship between social and financial performance for UK funds, but the authors employ a social rating as screening criteria.

2. Literature review

2.1. Introduction

During the last decades, the SRI industry has experienced a high growth and became very fashionable. This trend was further supported by investors' reactions to well-known corporate and environmental scandals that became public in the beginning of the millennium, and their increased sensitivity to issues such as emissions control, global warming, human rights, labour and community relations.

Nevertheless, despite the increasing popularity of SRI, some academic studies are cautious about the claims made on its behalf. For example, Watson (2011) indicates that there appears to be a marketing strategy in the SRI sector exploiting the currently high positive sentiment amongst investors. Utz and Wimmer (2014) also question the social level of SRI labelled funds given that SRI mutual funds, on average, do not hold socially responsible firms to a greater extent than conventional funds do.

Even though there are many arguments pointed out in favour of a positive or negative relationship between financial performance and Corporate Social Responsibility (CSR), there is still an ongoing debate over whether adding an ethical dimension to the stock selection process generates value. On the empirical side, an overwhelming body of research has tested these different predictions. Some evidence points out that socially controversial stocks earn abnormal positive returns, but other evidence suggests that stocks of companies with high scores on environmental and social responsibility issues outperform companies with poor social records on these issues. Also, most studies conclude that socially responsible funds neither outperform or underperform their conventional peers.

For instance, on the one hand, Diltz (1995) finds that employing environmental and military screens leads to a significantly positive performance, and Renneboog *et al.* (2008b) conclude that funds adopting a community involvement policy have better returns. On the other hand, Chong *et al.* (2006) find that the risk-adjusted performance of stocks in the Vice Fund (the antithesis of SRI) is superior to both the Domini Social and the Standard & Poor's 500, and Fabozzi *et al.* (2008) and Hong and Kacperczyk (2009) show that "sin" stocks (alcohol, tobacco, gaming) outperform the market.

SRI investors are a heterogeneous group, and so there is a great diversity of funds in

terms of the intensity and the variety of types of screens used. Considering such heterogeneity, it seems unreasonable to assume that different types of social criteria have the same effect on investment portfolios' returns. Thus, not all dimensions of social responsibility may be rewarded similarly and thus treated alike (Renneboog *et al.*, 2011; Areal *et al*., 2013).

Although each SRI fund is practically unique in the way it offers a specific combination of investments personalized to the social needs of a particular group of investors, Renneboog *et al.* (2008a) identify four generation of screening processes. The first generation of screens is characterized by the enforcement of negative screens, by specifying stocks or industries that should be excluded from SRI portfolios on the basis of social, environmental and ethical criteria. Alcohol, tobacco, and gambling typically represent the most common restrictions used in negative screening strategies. Positive screens constitute the second generation of screens, and involve selecting stocks of companies that accomplish superior standards of CSR in specific dimensions such as community involvement, environment, diversity, employee relations, among others. Positive screening strategies are often combined with a "best-in-class" approach, according to which firms are ranked within each industry or market sector based on social criteria. Renneboog *et al.* (2008a) highlight that US and UK markets are more focused on negative screens, while positive screens and the "best-in-class" strategy are more popular in Continental Europe. The third generation of screens refers to an integrated approach of selecting companies based on the economic, environmental and social criteria comprised by both negative and positive screens ("triple bottom line"), and the fourth generation combines the third generation with shareholder activism (attempt to influence the companies' actions through direct dialogue with the management, or by the use of voting rights).

2.2. Theoretical approaches

Theoretically, two opposing views emerge as crucial to the discussion on the financial merits of considering socially responsible criteria in the investment process. These two approaches have been competing with each other to provide plausible explanations to the impact of social screening on portfolios' performance - this is known in the literature as the debate between Markowitz (1952) and Moskowitz (1972) (Kurtz, 1998).

The first approach is supported by modern portfolio theory and claims that including socially responsible criteria implies in a financial penalty. According to Markowitz (1952), social screens constrain the portfolio mean-variance optimization framework and the limitations imposed by screening reduce the potential diversification of SRI portfolios. The

exclusion of specific companies, and perhaps entire sectors, can be reflected in higher levels of risk (Barnett and Salomon, 2006). Additionally, if we assume markets are efficient, securities' prices would have already incorporated all relevant factors (including the financial consequences from CSR), whereby none selection criteria (from social nature or not) can provide a consistently superior performance (Moskowitz, 1972). Finally, the implementation of social screens involves increased costs of obtaining and monitoring information (Barnett and Salomon, 2006; Areal *et al*., 2013).

Alternatively, another viewpoint suggests that the information associated with CSR may not be properly incorporated in the prices of securities, allowing portfolios constructed on the basis of this information to provide superior returns, as in Moskowitz (1972). A key assumption underlying this hypothesis is that stock markets misplace information on CSR in the short run such that SRI funds may outperform conventional funds in the long run (Renneboog *et al*., 2008b). Advocates of SRI argue that screening practices allow fund managers to generate value-relevant non-public information on issues such as managerial competence and superior corporate governance (Renneboog *et al.* 2008a). Accordingly, social criteria are useful tools to identify companies with higher management quality (Bollen, 2007). As a consequence, the potential loss of efficiency as a result of the use of a restricted universe of securities can be more than offset by the inclusion of companies representing better investment opportunities (Barnett and Salomon, 2006). This viewpoint, supported by stakeholder theory (Freeman, 1984), is consistent with the argument that social investors have a multi-attribute utility function that does not just include risk-reward optimization, but also incorporates personal and societal values (Bollen, 2007).

In sum, modern portfolio theory holds that social responsibility will damage financial performance. However, consistent with stakeholder theory, proponents of SRI argue that some firms can be consistently better financial performers than others because of their social oriented characteristics (Barnett and Salomon, 2006). It is clearly a debate between two paradigms, namely the traditional and still dominant paradigm, and the new paradigm of behavioural finance, which advocates that investors incorporate variables as happiness and non-financial profits in their investment decisions. However, it can be argued, as in Barnett and Salomon (2006), that both perspectives, instead of being competitors, are in fact complementary, and the relationship between social and financial performance may be curvilinear, and not strictly monotonic.

2.3. Empirical studies

Most academic studies find that the performance of SRI funds is not statistically different from the performance of conventional funds. Among others, Hamilton *et al.* (1993), Goldreyer *et al.* (1999), Statman (2000) and Bello (2005), for US funds, Luther *et al.* (1992), Mallin *et al.* (1995) and Gregory *et al.* (1997) for UK funds find similar results in the sense that SRI fund performance is no better or worse than that of non-SRI funds and benchmark indexes. Studies focusing on other individual markets, including Scholtens (2005) on Dutch funds, Bauer *et al.* (2006, 2007) on Canadian funds and Australian funds, respectively, and Fernandez-Isquierdo and Matallin-Saez (2008) on Spanish funds, find similar results. Other studies, such as Schröder (2004), Bauer *et al*. (2005), Kreander *et al.* (2005) and Cortez *et al.* (2009, 2012) focus on multiple markets and also find that the performance of SRI funds is not statistically different from that of their conventional peers.[2]

It is important to note, however, that these studies analyse SRI fund performance disregarding the fact different funds might use different screening strategies, which may impact performance in a different way. Recently, several papers move away from the simplistic search of answers for the performance of SRI as a whole, and focus on the question of "*when does it pay to be good*" (Capelle-Blancard and Monjon, 2014).

The analysis of the distinct screening characteristics used by SRI funds may play an important role in clarifying this issue. Barnett and Salomon (2006) and Renneboog *et al.* (2008b) are two seminal studies that find that screening intensity and some dimensions of social responsibility are intrinsically related to a higher financial performance.

Barnett and Salomon (2006) find a curvilinear relationship between screening intensity and financial performance for US funds. In particular, when the number of social screens used by a SRI fund increases, financial returns decline at first, but then rebounds as the number of screens reaches a maximum. This suggests the two long-competing viewpoints (modern portfolio and stakeholder theories) may be both valid. These results are consistent with a trade-off between the effects of diversification and selective choice of socially responsible companies,

[2] There are a few exceptions to this type of results. For instance, Gil-Bazo *et al.* (2010) show that US SRI funds outperform conventional funds. In contrast, Renneboog *et al.* (2008b) find that SRI funds in France, Ireland, Sweden and Japan, perform worse than their conventional peers. For a more detailed analysis, see the meta-analysis of SRI portfolio performance studies of Revelli and Viviani (2015), who conclude that SRI funds do not perform differently than conventional funds.

and so "middle" funds may be the most penalized, since they may not be able to effectively eliminate unsystematic risk, or keep away from their portfolios companies with worst performance.

To determine if investors pay (or not) a price of ethics, Renneboog *et al.* (2008b) investigate the under- and outperformance hypotheses for US, UK and European and Asia-Pacific SRI funds. The authors find that high screening intensity constrains the risk-return optimization and fund returns decrease with screening intensity on social and corporate governance criteria, but not on ethical or environmental criteria.

Focusing on UK SRI funds, Biehl and Hoepner (2010) use a slightly different approach from other studies, namely a rating of SRI funds as screening criteria. The authors conclude that the portfolios with the highest social ratings underperform significantly, and propose two theoretical explanations for the results of Barnett and Salomon (2006): first, funds which apply few screening criteria do not limit their universe in a way that it would affect their diversification, i.e. the elimination of specific risk; and second, if funds apply several screens it is likely that they select companies which achieve superior long-term results.

Lee *et al*. (2010), for US SRI funds, and Capelle-Blancard and Monjon (2014), for French SRI funds, observe that a high number of screens negatively impacts performance, while Humphrey and Lee (2011) find weak evidence that screening intensity increases risk-adjusted performance of Australian funds. Lee *et al.* (2010) also suggest that screened portfolios are able to obtain adequate levels of diversification (they find no relation between idiosyncratic risk and screening intensity), whilst Capelle-Blancard and Monjon (2014) highlight that only sectoral screens (such as avoiding "sin" stocks) decrease financial performance; transversal screens have no impact. Like Barnett and Salomon (2006), they also find that the initial negative effect is partly offset as the number of screens increases.

With respect to the return/risk binomial, and for a dataset of European socially responsible funds, Laurel (2011) finds that screening intensity has no effect on returns but has a curvilinear effect on risk. This means that funds with the least amount of screens have lower risk; this risk increases with the number of screens but then again decreases at high screening intensity (inverted U-shaped effect).

Additionally, Barnett and Salomon (2006) find that financial performance varies with the types of social screens used: community relations screening increases financial performance, whereas environmental and labour relations screening decrease financial performance. With a different categorization, Renneboog *et al.* (2008b) show, for a dataset including worldwide funds, that the number of corporate governance and social screens

significantly reduces financial performance, while the number of ethical screens, "sin" screens, or environmental screens do not have significant impact on performance.

In line with these group of studies, Renneboog *et al.* (2011) show that the flow-performance relationship for SRI investors depends on the types of screens used and on screening intensity.

Table 1 summarizes the main features and contributions of the papers that have addressed the relationship between the intensity and social dimensions of screens used by SRI funds and financial performance.

[INSERT TABLE 1]

Besides evidence that the type of social screens used can influence SRI performance, there are also some studies at the corporate level that show a relationship between specific dimensions of CSR and financial performance, and studies which focus on subsets of SRI funds (mainly green and religious funds).

Concerning CSR, some authors show that firms that have good labour relations will benefit in terms of improved performance. For example, based on KLD ratings, Kempf and Osthoff (2007), and Statman and Glushkov (2009) report significant outperformance of portfolios of companies that perform well on the employee relations dimension. Based on the performance of America's 100 Best Corporate Citizens, Brammer *et al.* (2009) support this type of findings. Additionally, Edmans (2011) demonstrates that an annually rebalanced portfolio of companies included in *Fortune* magazine's "100 Best Companies to Work For in America" list outperforms the benchmarks.

A growing body of empirical literature also reports a positive relation between corporate environmental performance and firm value. Klassen and McLaughlin (1996) study the effect of published reports of events and awards on firm valuation and find that the marketplace rewards firms which minimize their adverse environmental impact, or improve their environmental programmes. In turn, Konar and Cohen (1997) show that polluting firms lose market value in a one-day window following the release of Toxic Release Inventory information, and Russo and Fouts (1997) complement previous work suggesting "*it pays to be green*". According to Dowell *et al.* (2000), firms adopting a stringent global environmental standard have much higher market values than firms with less stringent, or poorly enforced standards. King and Lenox (2001) also find evidence of an association between lower pollution and higher financial valuation, while Konar and Cohen (2001) suggest that firms that are

disposing of relatively smaller amounts of toxic chemicals, and those that are confronted with few or no environmental lawsuits, tend to have higher market value. Derwall *et al.* (2005) show that a portfolio of companies labelled the most eco-efficient significantly outperform their least eco-efficient counterparts, and Salama (2005) points out that it appears that investors who target environmentally admirable companies do not incur a financial penalty. Following the same line of reasoning of Derwall *et al.* (2005), Guenster *et al.* (2011) report that corporate environmental performance relates positively to operating performance and market value.

In contrast, other studies – e.g., Cordeiro and Sarkis, 1997; Filbeck and Gorman, 2004; de Haan *et al*., 2012 – support a negative relationship between environmental and financial performance. Cordeiro and Sarkis (1997) show a significant negative relationship between corporate environmental activism and earnings per share performance forecasts, whilst Filbeck and Gorman (2004) demonstrate a negative relationship between financial return and a pro-active measure of environmental performance in electric utilities. Employing the Carhart (1997) four-factor model plus a fifth factor that captures risks associated with corporate environmental performance, de Haan *et al.* (2012) also find a negative relationship between environmental performance and stock returns.

Considering different dimensions of CSR, other studies document a positive impact in the financial performance of firms with good community relations (Waddock and Graves, 2000; Simpson and Kohers, 2002; Rodgers *et al*., 2013) and customer relations (Rodgers *et al*., 2013). Waddock and Graves (2000) show that companies that invest in stakeholder relations have above-average values of accounting performance measures, while Simpson and Kohers (2002), using the Community Reinvestment Act as a measure of social performance, support a positive link between social and financial performance. Additionally, the study of Rodgers *et al*. (2013) on the top corporate citizens provides evidence that two dimensions of CSR - customer and community relations - have a positive effect on both financial health and market value of firms.

At the mutual fund level, academic research that focus on a particular criterion is still emerging, but there are already some studies that focus on the performance of funds that use specific screens like green or religious funds. In what concerns green investments, most empirical studies show that environmental mutual funds do not perform differently (e.g., White, 1995; Mallett and Michelson, 2010; Climent and Soriano, 2011; Muñoz *et al*., 2014), or underperform their conventional counterparts and/or the market (e.g., Climent and Soriano, 2011; Chang *et al*., 2012; Ibikunle and Steffen, 2015; Silva and Cortez, 2016).

White (1995) shows a similar (inferior) performance of German (US) green funds in relation to market. Later, Mallett and Michelson (2010) conclude that there is no real difference

in terms of performance between green funds and SRI and index funds, whilst Climent and Soriano (2011) find that green funds have lower performance (or similar if we consider a shorter sample period) than conventional funds with similar characteristics. Chang *et al.* (2012) also show that US green mutual funds generate lower returns and similar risks relatively to US conventional mutual funds. Muñoz *et al.* (2014) show a similar performance between green and other SRI funds, regardless of the market cycle (crisis or non-crisis). Ibikunle and Steffen (2015) show that green funds significantly underperform their conventional peers, while there are no statistical differences between green and black (fossil energy and natural resource) funds. More recently, Silva and Cortez (2016) show that US and European global green funds tend to underperform the benchmark, particularly in non-crisis periods.

Besides green funds, another subset of SRI funds that has been somewhat explored is faith-based funds. Although Hayat and Kraeussl (2011) and Ferruz *et al*. (2012) show religious mutual funds underperform conventional ones, other studies find a neutral performance of religious funds in relation to the market (Boasson *et al*., 2006; Hoepner *et al.*, 2011) and to other types of socially responsible mutual funds (Areal *et al.*, 2013). On the contrary, Lyn and Zychowicz (2010) show that faith-based funds mostly outperform the market, and this kind of screened mutual funds exceeds the financial performance achieved by other types of US SRI funds. In turn, Abdullah *et al.* (2007) find that Islamic mutual funds perform better than conventional mutual funds during bearish economic trends, whereas conventional mutual funds show better performance for bullish economic conditions.

Several papers in this field focus on the impact of the screening features on SRI fund performance in different economic cycles. The central issue here is the one formulated by Nofsinger and Varma (2014): "*would investors be willing to give up some return in non-crisis market periods to gain some higher returns during crisis periods?*". Areal *et al.* (2013) assess whether socially responsible or irresponsible investments perform better in "good times" or "bad times", and conclude that the use of different screens might impact mutual fund performance across different market regimes: the Vice Fund, which invests in unethical firms, outperforms in low-volatility regimes and underperforms in high-volatility regimes. For European and US funds, Muñoz *et al.* (2014) point out that green funds do not perform worse than other forms of socially responsible mutual funds, and this conclusion holds after controlling for crisis market periods. The results of Silva and Cortez (2016) suggest that the performance of green funds is higher in crisis periods in comparison to non-crisis periods.

Nofsinger and Varma (2014) observe that SRI attributes drive an asymmetric return pattern in which SRI funds outperform conventional funds in market crisis periods but

underperform in non-crisis periods (SRI act like a protective shield in negative market cycles). The authors suggest that the positive socially responsible features of companies result in lower risk in market crisis periods, and this is a factor that can explain SRI popularity. Nevertheless, this behaviour – outperformance in crisis periods – is driven by funds that screen based on shareholder advocacy and ESG issues; SRI funds that focus on "sin" stocks or other product screens, and faith or religious funds, do not outperform in crisis periods.

For French socially responsible funds investing in European markets, Leite and Cortez (2015) show that SRI funds significantly underperform their conventional peers during non-crisis periods. The authors also conclude that this result is driven by funds that employ negative screens (SRI funds that use only positive screens exhibit similar performance to conventional funds across different market states). Gangi and Trotta (2015) focus on the performance of European socially responsible funds during the international financial crashes of 2008 and 2011, and their empirical findings prove that investments that consider ethical issues are able to contain the negative effects during the "bear" phases of the market (CSR is able to compensate the "ethical sacrifice" supported by investors). Becchetti *et al.* (2015) support this type of results and show that SRI funds played an "insurance role" outperforming conventional funds during the global financial crisis. In relation to the Japanese market, Nakai *et al.* (2016) document that SRI funds resisted better to the bankruptcy of the Lehman Brothers (the momentous event that triggered the financial crisis) in comparison to conventional funds.

For SRI bond funds, Henke (2016) identifies a strong outperformance during crisis periods, reinforcing the idea that SRI funds are attractive investment opportunities that accumulate abnormal returns during recessions or bear market periods. The results of Leite and Cortez (2016) illustrate that, during expansions, European SRI bond funds outperform their conventional peers, whereas during recessions they seem capable to perform similarly to conventional funds.

Overall, the purpose of this investigation is to extend earlier research on the relationship between the financial performance of SRI funds and the characteristics of the non-financial screening process. Specifically, and since the evidence remains fragmented, we intend to investigate and enlighten the impact of the heterogeneity in the SRI funds' industry for a dataset of US and European funds, some of which belonging to the most developed SRI markets in the world.

3. Research hypotheses

This paper investigates whether screening intensity (the number of screens employed) and the type of criteria used (i.e. Environmental, Social and Governance - ESG - screens) influence funds' financial performance. Accordingly, we develop a set of hypotheses on the relationship between portfolio financial performance and screening intensity and type of social screens used.

Modern portfolio theory advocates a negative relationship between the number of screens used and portfolio performance (hypothesis 1a) since the exclusion of companies based on SRI screens may constrain the investment opportunities, thereby affecting the risk-return optimization process. For instance, SRI funds typically do not invest in "sin" stocks, although these stocks have historically outperformed the market (Renneboog *et al.*, 2008b). Thus, investors who base their decisions on social and personal values and derive non-financial utility from investing in companies meeting high social standards may be willing to explicitly deviate from the economically rational goal of wealth-maximization and accept a lower rate of return - the underperformance hypothesis.

Conversely, stakeholder theory argues that socially responsible behaviour of companies and managers allows companies to integrate the interests of all stakeholders, thus contributing to an improved performance of funds including these companies (hypothesis 1b). Also, SRI screens can be viewed as filters to identify managerial competence and superior corporate governance (value-relevant information not completely embedded in the share prices), or to avoid/reduce the potential costs of corporate social crises and environmental disasters (Renneboog *et al.*, 2008b), which supports the outperformance hypothesis.

Thereby, we set up the following mutual exclusive hypotheses:

Hypothesis 1a: A higher screening intensity reduces the performance of SRI funds (underperformance hypothesis).

Hypothesis 1b: A higher screening intensity enhances the performance of SRI funds (outperformance hypothesis).

Following Barnett and Salomon (2006), we also hypothesize a curvilinear relationship between screening intensity and financial performance (consistent with both modern portfolio theory and stakeholder theory). The intuition of this research hypothesis is that the financial loss carried by a SRI fund when it imposes social restrictions is, after a certain level of

screening intensifies, offset by the financial benefits of including better-managed and more solid firms into the portfolio (Barnett and Salomon, 2006).

Hypothesis 2: The relationship between the intensity of social screening and financial performance for SRI funds is curvilinear.

Like previous papers, we also integrate in the analysis the type of screens used, defined as the specific ESG factors the fund focuses on. A number of empirical studies argues that SRI funds may be oriented towards specific ESG criteria which impact performance differently.[3] To account for different types of screens, Barnett and Salomon (2006) employ five dummies, namely for environment, labour relations, equal employment, community investment, and community relations screens. In turn, Renneboog *et al*. (2008b) define four types of screens, specifically "sin", ethical, environmental, and social and corporate governance, whereas Capelle-Blancard and Monjon (2014) and Nofsinger and Varma (2014) emphasize labour relations, community relations and environment.

We follow the categorization employed by US SIF – The Forum for Sustainable and Responsible Investment[4], namely environment, social, governance, products and shareholder engagement. Although this study is not restricted to American funds, the US SIF is a reference in the SRI research field, and establishes a relatively wide classification of screens (encompassing 16 positive and negative screens)[5] that can also be applied to European funds.

Thus, we hypothesize that:

Hypothesis 3a: SRI funds that select firms based on environmental screening criteria (climate/clean tech, pollution/toxics, environment/other) obtain higher returns than those that do not screen on these criteria.

Hypothesis 3b: SRI funds that select firms based on social screening criteria (community development, diversity and equal employment opportunity policies, human rights, labour relations, Sudan) obtain higher returns than those that do not screen on these criteria.

[3] Furthermore, there is also evidence (discussed in section 2.3.) that investing in companies that focus on specific dimensions of social responsibility (e.g. labour relations, environment, community relations) provides positive abnormal returns.

[4] The US SIF is an organization that promotes the integration of socially responsible behaviour in the investment practices in the United States.

[5] For example, combining the information from a variety of data sources, Renneboog *et al.* (2008b) identified a total of 21 screens used by SRI funds around the world.

Hypothesis 3c: SRI funds that select firms based on governance screening criteria (board issues, executive pay) obtain higher returns than those that do not screen on these criteria.

Hypothesis 3d: SRI funds that select firms based on products screening criteria (alcohol, animal welfare, defense/weapons, gambling, tobacco) obtain higher returns than those that do not screen on these criteria.

Hypothesis 3e: SRI funds that select firms based on shareholder engagement screening criteria obtain higher returns than those that do not screen on these criteria.

In line with Capelle-Blancard and Monjon (2014), another relevant distinction is between sectoral and transversal criteria: sectoral criteria refer to the exclusion of entire sectors (i.e. "sin" screens and environmental screens), while transversal criteria apply to all firms (i.e. commitment to international conventions - United Nations Global Compact, International Labour Organization Rights at Work, etc.). The authors defend it is likely that portfolio diversification is more impacted by sectoral screens (which target specific sectors) than by transversal screens. Hoepner and Schopohl (2016) also address the exclusionary screening of two leading Nordic investors from a dual perspective, namely the sector-based exclusion (company's business model), and the norm-based exclusion (company's violation of international norms). The results indicate initial evidence that the performance effect differs between these two exclusion decisions.

So, we establish the following hypothesis:

Hypothesis 4: Only sectoral screens affect financial performance; transversal screens do not have any impact.

Additionally, we will focus on the screening strategy signal: positive (seeking out stocks with good ESG performance) versus negative (weeding out poor ESG performing stocks), since is reasonable to assume that both strategies will lead to different financial performance results (Ferruz *et al.*, 2012). Goldreyer *et al.* (1999) find that SRI funds which impose positive screens outperform funds that do not have positive screens. Humphrey and Lee (2011) conclude that positive screening significantly reduces risk, while Nofsinger and Varma (2014) demonstrate that the asymmetric return pattern in ESG funds is especially

pronounced in those that use positive screening techniques. Leite and Cortez (2015) also find that SRI performance across different market conditions is related to positive/negative screening strategies. The findings of Trinks and Scholtens (2015) further suggest that there are opportunity costs to negative screening.

Therefore, concerning the impact of positive and negative screening, we formulate the next hypothesis:

Hypothesis 5: SRI funds that use positive screening techniques obtain higher returns than those that use negative screening techniques.

Finally, we will distinguish funds that have received at least one sustainability label. SRI labels are certifications attributed to socially responsible funds, which have emerged with the purpose of providing investors with quality standards and more transparency on socially responsible investment products.[6] For the US market, we will identify the funds with the *Diamond Standard*[7] label. For European funds, we will also distinguish the funds awarded with the following certifications: *Ethibel Pioneer*[8], *European SRI Transparency Code*[9], *Luxembourg Fund Labelling Agency* (LuxFLAG)[10], *Novethic SRI Label*[11], *Novethic Green Fund Label*[12], *Austrian Eco Label*[13], and *United Nations Principles for Responsible Investment*

[6] Considering concerns that the socially responsible denomination of mutual funds might be more of a marketing tool (Utz and Wimmer, 2014), the purpose of SRI labels is to ensure investors that the fund actually complies with the stated social screens.

[7] *Diamond Standard* is a guarantee of quality assigned by website yourSRI, a database which provides the search, comparison and rating of several companies and investment products through their investment profile and SRI classification. The sustainability performance of a fund is constructed on the basis of more than 70 indicators, offering an overview of the fund's strengths and weaknesses in comparison to its peers in terms of research quality, portfolio quality, engagement and transparency (yourSRI, 2016).

[8] *Ethibel Pioneer* is a quality label applied by Forum Ethibel to investment funds which exclusively invest in shares or bonds included in the Investment Register and with an A or B rating (usually industry leaders in terms of CSR) (Forum Ethibel, 2016).

[9] The *European SRI Transparency Code* was launched to increase the accountability and clarity of SRI practices for European investors. It focuses on SRI funds in Europe and has been designed to cover a range of asset classes, such as equity and fixed income (EUROSIF, 2016).

[10] The objective of the *Luxembourg Fund Labelling Agency* is to assure investors that the investment fund invests their assets, directly or indirectly, in the responsible investment sector – e.g., the LuxFLAG Environment Label, which primarily invests in environmental-related sectors (LuxFLAG, 2016).

[11] The *Novethic SRI Label* is the first European certification granted to SRI funds managed strictly on the basis of ESG criteria, and that ensures a high degree of transparency in the SRI management processes used (Novethic, 2016).

[12] The *Novethic Green Fund Label* is awarded to funds that select companies on the basis of environmental standards. The certified funds must also meet transparency, social and governance criteria (Novethic, 2016).

[13] The *Austrian Eco Label* was created by government initiative and certifies environmentally friendly products and services, as well as projects and companies within the financial services sector which achieve long term positive returns linked to ethical, sustainable and socially responsible activities (Umweltzeichen, 2016).

(UNPRI)[14].

The evidence of Silva and Cortez (2016) suggests a tendency for green funds that are certified with a label to perform better than uncertified green funds. We believe that SRI labels are a guarantee of compliance with ESG principles awarded by associations recognized as experts, and not merely a marketing artefact. So, we postulate the following:

Hypothesis 6: SRI funds that operate under at least one SRI label obtain higher returns than those that do not.

4. Data

Much of the research on SRI funds has focused on the US and UK markets, two world leaders in sustainable and responsible finance, and with long traditions in this area. The US SIF 2016 Report identifies 8,72 trillion of dollars of total assets under management using SRI strategies at the beginning of 2016, an increase of 33% since 2014, and a 14-fold increase since 1995, when the US SIF Foundation first measured the size of the US SRI market. In relation to the UK, it is worth mentioning that it is the first country that regulated the disclosure of social investment policies of pension funds and charities (Renneboog *et al*., 2008a), and one of Europe's most significant SRI markets.

Although the US is still the SRI world leading market, Europe is growing substantially in terms of assets and number of funds considering ESG criteria. According to the 2014 Review from Vigeo[15], the total of assets under management in Europe amounts to 127 billions of euros (108 billion in the previous year), with France having the leading role in terms of assets under management (46 billions of euros), number of funds (263) and new openings (25). It should be also noted that the 2014 market share of SRI funds increased in all markets, with remarkable increases in the Netherlands (17,8% of the national assets under management), Belgium (7,5%), France (4%), Switzerland (3,8%) and Germany (3,1%).

This study investigates US and European socially responsible mutual funds. With regard to European funds, we will focus on the countries covered by the reports and surveys of

[14] The *United Nations Principles for Responsible Investment* Initiative is a network of investors which believe that ESG issues can affect the performance of investment portfolios and also acknowledge that applying the six principles may better align investors with broader objectives of society (UNPRI, 2016).

[15] Vigeo is a rating agency specialized in the review of European companies and organizations that comply with ESG principles.

Vigeo, a benchmark in terms of European SRI, namely Austria, Belgium, Denmark, France, Germany, Italy, Luxembourg, Netherlands, Norway, Sweden, Switzerland, and United Kingdom[16]. Our dataset includes SRI equity funds from these countries. To avoid data duplication, in the case of funds with different classes, only one class of each fund is considered. As first criterion, we select the oldest class; if the inception date is the same, we chose the class with more assets under management. Finally, in order to be included in our sample, the SRI funds must disclose at least one screen as part of their investment policies.

4.1. US funds

Our subsample of US funds consists of 80 socially responsible mutual funds over the period January 2000 to December 2014. The information on the funds is mainly extracted from two US SIF data sources: the Mutual Fund Performance Chart[17] on 31st December 2014 and the SRI Trends Reports[18]. The Mutual Fund Performance Chart provides information on the social screening strategies (number and type of social screens employed) of a set of surviving funds at the end of 2014. For the other funds of the sample, we manually collected the information on social screens through the funds prospectuses and websites, as well as from US Securities and Exchange Commission (SEC) files.

Considering the problems that may be raised by survivorship bias (Brown *et al.* 1992), we included not only surviving funds but also funds that disappeared during the period under evaluation. Although we use the 2001 to 2012 SIF SRI Trends Reports to identify funds that got liquidated or merged during the sample period, we cannot ensure we were able to identify all dead funds.

Information on the screening criteria used by funds is not available historically, so we recognize the inherent assumption that the screening strategy of the mutual funds did not change over time. Given that the funds in the sample can be considered quite young (with a mean age of 14 years), it is reasonable to assume that the screening strategies did not change dramatically over time. Humphrey and Lee (2011) also mention this assumption. The authors note that none of the funds with completed survey information changed their screening

[16] We excluded Spain due to insufficient data.

[17] The US SIF Mutual Fund Performance Chart contains the socially responsible mutual funds offered by US SIF's institutional member firms.

[18] Although US SIF publishes reports since 1995, the list of SRI funds is included in the report only since 2001. Thus, our analysis includes the years 2001, 2003, 2005, 2007, 2010 and 2012. We exclude 5 categories from the US SIF listings, namely *Other pooled products*, *Annuity funds*, *Exchange-traded funds*, *Closed-end funds* and *Alternative investment funds*.

practices over the sample period.

4.2. European funds

To identify SRI funds domiciled in Europe, we followed Renneboog *et al.* (2008b) and Nofsinger and Varma (2014) and first searched on Datastream for certain keywords that are common in SRI fund names, such as "Social", "Socially", "Ecology", "Environment", "Green", "Sustainability", "Sustainable", "Ethics", "Ethical", "Faith", "Religion", "Christian", "Islam", "Baptist", and "Lutheran". We then intersected the information obtained from Datastream with the funds' fact sheets (concerning the European countries covered by Vigeo) available on the website yourSRI[19]. The fact sheets provide information about the investment objective, SRI classification (screens and SRI labels), and investment profile (investment category, regional focus, asset status, domicile, inception date, benchmarks), among other data, for SRI funds around the world. Although this procedure for identifying SRI funds has allowed us to detect dead funds, we acknowledge that our European SRI sample may not be survivorship bias free.

Since Luxembourg is chosen as domicile for many funds mainly because of its favourable tax laws, we will distribute the funds based on the countries of origin of the fund management companies, as in Renneboog *et al.* (2008b). Thereby, the resultant sample consists of 250 funds domiciled in 12 European countries, from January 2000 to December 2014. The majority of the funds are from Switzerland (26%), France (22%), and United Kingdom (13%). Similar to US funds, we assume static screening strategies during the sample period (on average, our European funds live 12 years).

The final sample results in an unbalanced panel[20] of 330 US and European funds over the period 2000 to 2014. Figure 1 shows the distribution of funds per country.

[INSERT FIGURE 1]

4.3. Risk Factors

The risk factors considered are the Fama and French (1993) three factors (market, size, and book-to-market) and the fourth factor suggested by Carhart (1997), momentum, which are

[19] yourSRI is a database and research platform for socially responsible products and services (yoursri.com).

[20] Some of the Size and Total Expense Ratio data are missing.

collected from the Professor Kenneth French Data Library.

For domestic US funds, we employ the Fama/French North American 3 factors plus the momentum factor. Similarly, for European funds that invest only in Europe, we use the Fama/French European 3 factors plus the momentum factor. For funds investing internationally, we use the Kenneth French global factors. All the factors are in US dollars, and the risk-free rate is the US one-month Treasury-bill rate, (as in Renneboog *et al*., 2008b; Nofsinger and Varma, 2014).

4.4. Financial performance

In line with previous studies (e.g. Barnett and Salomon, 2006; Renneboog *et al*., 2008b; Capelle-Blancard and Monjon, 2014), the dependent variable is the risk-adjusted performance, computed on the basis of the monthly returns of SRI funds denominated in US dollars. For both US and European funds, we use Datastream to collect each fund's end of month Return Index (from January 2000 through December 2014). Discrete returns are calculated on a monthly basis. A minimum of 36 months of return data across the sample period is required. Figure 2 presents the average monthly returns over the sample period.

[INSERT FIGURE 2]

The figure shows that, at the beginning of the period in analysis (2000 to 2002), the average returns of US funds are higher than the average returns of European funds. The situation was reversed during the years 2003 to 2007, and then again recovered in 2009. Additionally, it seems clear the peak of the global financial crisis of 2008, with highly negative average returns, and very similar for US and European funds.

The procedure to estimate monthly risk-adjusted returns is based on Ferreira *et al.* (2013), i.e. we estimate regressions of 36 months on a rolling monthly basis. First, every month, we regress the previous 36 months of fund excess returns on the market excess returns and the size, value/growth and momentum factors, as in Carhart (1997). From each of these regressions, we obtain the monthly estimates from the beta coefficients. We then use these estimates along with the value of the respective factors to calculate the expected return of each fund in each month. Monthly alphas (i.e. the abnormal performance measure) are calculated by subtracting these values to the effective return of each fund. Since this process requires 36 months of prior information and the analysis begins in January 2000, we get the first performance estimates in

January 2003. This performance measure is the dependent variable of our model.

Table 2 reports the descriptive statistics of the risk-adjusted performance by country.

[INSERT TABLE 2]

The average risk-adjusted performance is negative in all countries. France enjoys by far the highest and lowest values during the period, followed by the United States.

4.5. Social variables

Although the definition of the social variables differs among studies, generally they emerge in the form of two groups: by screening intensity and by type.

Screening intensity is a quantitative variable constructed to measure the strength of the requirements imposed by fund managers to filter firms, the lack of diversification of SRI funds and, to some extent, the quality of the process (Capelle-Blancard and Monjon, 2014). Differently, the second group of variables of interest is of a qualitative nature. Their aim is to emphasize the "best practices" among the SRI funds.

In this study, screening intensity is proxied by the number of screens applied by each fund. As mentioned previously, we will apply the US SIF's screening categorization to all (US and European) funds. The US SIF defines 16 types of screens that SRI funds may use to filter firms from their investment portfolios, namely climate/clean tech[21], pollution/toxics[22], environment/other[23], community development[24], diversity & equal employment opportunity

[21] These screens focus on risk and opportunities related to climate change and greenhouse gas emissions, or on businesses dedicated to environmentally sustainable technologies, efficient use of natural resources, or mitigating negative ecological impacts; includes clean energy generation, infrastructure and storage (US SIF, 2016).

[22] These screens consider the toxicity of products and operations and/or pollution management and mitigation, including recycling, waste management and water purification (US SIF, 2016).

[23] This category of screens focuses on residual environmental issues (other than climate/clean tech or pollution/toxics) (US SIF, 2016).

[24] These screens focus in provision of affordable housing, fair consumer lending, small and medium business support and other services and support to low- and medium-income communities (US SIF, 2016).

policies[25], human rights[26], labour relations[27], Sudan[28], board issues[29], executive pay[30], alcohol[31], animal welfare[32], defense/weapons[33], gambling[34], tobacco[35] and shareholder engagement[36]. If a fund's screening intensity is given a value of 16, this indicates that the fund employs all 16 of the listed screens, whereas a value of 1 indicates that the fund uses only 1 of the 16 available screens. Figure 3 illustrates the screening intensity of all funds in the sample.

[INSERT FIGURE 3]

The screening intensity of the SRI funds of our sample varies widely. More than 50% of the funds apply between 1 and 4 screens, while only about 10% apply a number of screens higher than 10. There are 11 funds (3,3% of the total sample) with the maximum screening intensity (16 screens), and 57 funds (17,3%) with the minimum screening intensity (1 screen).

To test hypothesis 4, we consider the number of sectoral screens and the number of transversal screens used by SRI funds. In the nomenclature of US SIF, we define as sectoral screens climate/clean tech, pollution/toxics, environment/others, alcohol, animal welfare, defense/weapons, gambling and tobacco, and as transversal screens diversity & equal employment opportunity policies, human rights, labour relations and Sudan. Sectoral screens

[25] These screens relate to diversity and equal employment opportunity policies and practices relating to employees, company ownership or contractors (US SIF, 2016).

[26] This category of screens considers risks associated with human rights and companies' respect for human rights within their internal operations and the countries in which they do business, often with particular emphasis on relations with indigenous peoples, supply-chain management and conflict zones (US SIF, 2016).

[27] This category of screens considers companies' labour or employee relations programs, employee involvement, health and safety, employment and retirement benefits, union relations or workforce reductions (US SIF, 2016).

[28] This type of screens involves the exclusion or partial exclusion of companies that conduct business in Sudan because of its human rights abuses or support of terrorism (US SIF, 2016).

[29] These screens consider the directors' independence, diversity, pay and responsiveness to shareholders (US SIF, 2016).

[30] These screens consider companies' executive pay practices, especially whether pay policies are reasonable and aligned with shareholders' or other stakeholders' long-term interests (US SIF, 2016).

[31] This type of screens involves the exclusion or partial exclusion of companies involved in the production, licensing and/or retailing of alcohol products, or in the manufacturing of products necessary for production of alcoholic beverages, as well as ownership by an alcohol company (US SIF, 2016).

[32] These screens consider companies' policies and practices toward animals in consumer product testing, where such testing is not legally required, particularly where such tests inflict pain or suffering on the test animals, and on the treatment of animals raised or used for food and other goods and services (US SIF, 2016).

[33]This category of screens involves the exclusion or partial exclusion of companies that derive a significant portion of their revenues from the manufacture or retailing of firearms or ammunition for civilian use, or from military weapons (US SIF, 2016).

[34] This type of screens involves the exclusion or partial exclusion of companies involved in licensing, manufacturing, owning or operating gambling interests (US SIF, 2016).

[35] These screens involve the exclusion or partial exclusion of companies involved in the production, licensing, and/or retailing of tobacco products, or in the manufacturing of products necessary for production of tobacco products (US SIF, 2016).

[36] These screens relate to filing or co-filing shareholder resolution and/or engaging in private dialogue on environmental, social or governance issues with companies in this investment strategy portfolio (US SIF, 2016).

vary from 1 to 8, and transversal screens from 1 to 4.

The type of screen is measured using a dichotomous variable for each of the screening strategies employed by US SIF, namely environment (screens related to climate, clean technology, pollution, toxics and other environmental issues), social (screens associated with community development, diversity and equal employment, human rights, labour relations and Sudan), governance (screens that account for board and executive pay issues), products (screens that exclude companies involved in alcohol, animal welfare, defense/weapons, gambling and tobacco products) and shareholder engagement. For instance, in order to test hypothesis 3a, we will assign a value of 1 to the variable environment if a fund screened out firms based on at least one environmental factor, and zero otherwise.

Similarly, to assess hypothesis 5, we establish a dummy variable for positive screening. Since most funds of our sample employ a combination of positive and negative screens (the third screening generation mentioned by Renneboog *et al*., 2008a), we decided to assign the value of 1 if the fund employs a higher number of positive screens (in relation to negative screens), and zero otherwise.

Finally, we will differentiate funds that have been awarded with at least one SRI label. Although there are more sophisticated methodologies to establish a ranking for mutual funds based on non-financial criteria (e.g. Petrillo *et al*., 2016), we will use a dummy variable for funds that have been certified by sustainability labels. The purpose of these labels is to provide investors with a quality standard (beyond the self-named label of socially responsible funds) by assuring the systematic integration of ESG criteria into mutual funds' management.

Table 3 provides some descriptive statistics on the screening characteristics of the SRI funds included in this study.

[INSERT TABLE 3]

Most SRI funds of our sample put the emphasis on products (73%), environment (56%) and social concerns (50%). The percentage is higher for US funds (in relation to European funds) for the five types of nature of the screening process (environment, social, governance, products, and shareholder engagement), with the largest differences occurring on corporate governance and shareholder engagement topics.

In our sample, almost all funds exclude entire sectors that do not comply with ESG principles (96%), and about 50% exclude firms, regardless of the industry, that do not subscribe fundamental international conventions, or connect with firms that have business relations in

Sudan. Moreover, nearly 51% of the funds employ the positive screening approach (42,50% of US funds, and 53,60% of European funds), and approximately two thirds are certified by SRI labels (with stronger focus on European funds – 76,40%).

4.6. Control variables

Since the main goal of this paper is to determine if the SRI positioning is compatible with profitability, it is necessary to control for factors that could systematically affect SRI performance. We therefore include a variety of variables previously recognized as likely to influence the financial performance of mutual funds, namely funds' characteristics (age, size, and total expense ratio) and investment style (domestic or global funds).

To address the "*catching-up phase"* in SRI funds identified by Bauer *et al*. (2005)[37], and following Barnett and Salomon (2006), Humphrey and Lee (2011) and Nofsinger and Varma (2014), among others, we include the variable *Age*, defined as the number of months since the fund's inception. For surviving funds in late December 2014, the variable is computed with reference to 31 December 2014; for missing funds, is calculated up to the liquidation or merger date.

In line with Barnett and Salomon (2006), Lee *et al.* (2010) and Capelle-Blancard and Monjon (2014), and in order to control for any potential size effect, we include the variable *Size*, measured by the fund total net assets (in million US dollars)[38]. Indro *et al.* (1999) and Chen *et al.* (2004) show that larger funds are subject to decreasing returns to scale. Ferreira *et al.* (2013) find a negative relation between fund size and performance only for US funds; for non-US funds, fund size is positively related to performance. In relation to SRI funds, Gregory *et al.* (1997) find that the fund size does not seem to affect performance results.

The *Total Expense Ratio* is a measure of the total costs associated with managing and operating an investment fund (management fees, trading fees, legal fees, auditor fees and other operational expenses)[39]. Empirical evidence on the impact of fees in performance is mixed. Chen *et al.* (2004) and Ferreira *et al.* (2013) do not find evidence of a relationship between fees and fund performance for US funds. Other authors find a negative relation between fees and fund performance (e.g. Carhart, 1997, Gil-Bazo and Ruiz-Verdú, 2009 in relation to US funds

[37] Bauer *et al.* (2005) investigate the returns of ethical mutual funds (relative to those of their conventional counterparts) through time and document that ethical mutual funds went through a so-called catching-up phase, possible due to a learning effect.

[38] Monthly data on total net assets of US and European funds are a courtesy of Thomson Reuters.

[39] This monthly variable is obtained from Datastream for both US and European funds.

and Dahlquist *et al.*, 2000 and Otten and Bams, 2002 in relation to European funds). Chang and Witte (2010) suggest that the costs of socially responsible investing are not homogeneous. Thus, the expense ratio may have impact on financial returns of SRI funds.

The following table reports the average values (from 2003-2014) by country of the 330 funds selected in this study concerning Age (in months), Size (in million US dollars), and Total Expense Ratio (in percentage).

[INSERT TABLE 4]

In our sample, the average fund Age varies from 108 (Switzerland) to 249 (Norway) months, while Size ranges from 22,97 (Austria) to 1392,90 (Norway) million dollars[40]. The Total Expense Ratio is between 1,23% (United States) and 2,02% (Italy).

Global and regional economic cycles may also affect financial performance and thus, funds with only domestic holdings may perform differently from those with international holdings. To monitor for performance differentials across funds with domestic and international holdings, and following several studies (e.g. Barnett and Salomon, 2006; Renneboog *et al.*, 2008b; Capelle-Blancard and Monjon, 2014), we incorporate a dummy variable *Global*. For US (European) funds, this variable takes the value of 1 if the fund invests outside US (Europe), and zero otherwise. With regard to the funds' regional objective, 72,5% of the US funds are domestic, and about 64% of the European funds diversify their assets outside Europe.

5. Methodology

The main research objective of this paper is to explore the relationship between the SRI filtering mechanisms and the performance of a dataset of US and European funds. This section presents the methodology for testing the effects of the intensity and type of investment screens applied on SRI funds' financial performance.

As mentioned in the previous section, we use the Carhart (1997) four-factor model (as in Renneboog *et al.*, 2008b, Lee *et al*., 2010 and Nofsinger and Varma, 2014, among others) to compute the risk-adjusted returns of the funds of our sample. Although a few papers apply

[40] The high average values of the Size variable for Norway and Sweden are related to the fact that these countries have few funds in the sample (5 and 13 funds, respectively), but very significant in terms of assets under management.

the CAPM based single factor alpha (e.g. Barnett and Salomon, 2006; Renneboog *et al.*, 2008b; Capelle-Blancard and Monjon, 2014), the limitations associated to the latter, namely the fact that it does not capture all relevant sources of systematic risk, motivates the use of multi-factor models. The Carhart (1997) model is one of the most commonly used models in the performance evaluation literature, and is an extension of the Fama and French (1993) three-factor model (that considers the market, size and value factors) including a momentum factor,[41] as follows:

$$r_{it} - r_{f,t} = \alpha_i + \beta_{iMKT}(r_{mt} - r_{f,t}) + \beta_{iSMB}SMB_t + \beta_{iHML}HML_t + \beta_{iUMD}UMD_t + \varepsilon_{it} \qquad (1)$$

where

r_{it} is the return of fund *i* in month *t*;

$r_{f,t}$ is the risk-free rate in month *t*;

r_{mt} is the market return in month *t*;

SMB_t, HML_t, and UMD_t are the *Small Minus Big* (i.e. return spread between a small cap portfolio and a large cap portfolio at time *t*), *High Minus Low* (i.e. return difference between a value stock portfolio and a growth stock portfolio at time *t*), and *Momentum* (i.e. difference in return between a portfolio of past winners and a portfolio of past losers at time *t*) factors;

α is the intercept;

β_{MKT}, β_{SMB}, β_{HML}, β_{UMD} are the factor loadings on the four factors (market, size, book-to-market, and momentum); and

ε_{it} stands for the error term.

The risk-adjusted performance of the SRI funds is the dependent variable of our study. We then examine whether it is related with the magnitude and type of the screening process, controlling for variables related to funds' characteristics and investment style.

In model (2), we postulate risk-adjusted performance as a linear function of screening intensity, to test whether including more social screens is positively or negatively related to fund financial performance, and estimate the following model:

[41] Although prior research has recognized the dynamic nature of the state of the economy, and that funds do not have constant betas (the funds' risk exposures change in response to public information on the economy, such as the level of interest rates and dividend yields), we will not employ a conditional model due to the problem which could be generated from the existence of a large number of betas to estimate by the model. Also, the fact that we are considering a rolling window somewhat accounts for time-varying risk exposures.

$$RAP_{it} = \gamma_0 + \gamma_1 SI_i + \gamma_2 L\_AGE_i + \gamma_3 L\_SIZE_{it} + \gamma_4 TER_{it} + \gamma_5 GL_i + \mu_{it} \quad (2)$$

where

RAP_{it} is the risk-adjusted performance of fund *i* in month *t*;

SI_i is the screening intensity of fund *i*;

L_AGE_i is the logarithm of the number of months since the fund's inception;

L_SIZE_{it} is the logarithm of the fund size (total net assets in million US dollars);

TER_{it} is the Total Expense Ratio of the fund *i*;

GL_i is a dummy variable equal to 1 if the fund *i* invests outside US (US funds) or Europe (European funds), and 0 otherwise; and

μ_{it} stands for the error term.

To assess hypothesis 2 and capture a potential curvilinear relationship between social screening and financial performance, we also include the square of the screening intensity $[(SI_i)^2]$.

$$RAP_{it} = \psi_0 + \psi_1 SI_i + \psi_2 SI_i^2 + \psi_3 L\_AGE_i + \psi_4 L\_SIZE_{it} + \psi_5 TER_{it} + \psi_6 GL_i + \mu_{it} \quad (3)$$

Models (4) [screening intensity only] and (5) [screening intensity and its squared term] add the types of social screens, as well as two other social variables – positive screening and labels – to assess whether screening strategies have influence on mutual fund performance.

$$RAP_{it} = \omega_0 + \omega_1 SI_i + \omega_2 ENV_i + \omega_3 SOC_i + \omega_4 GOV_i + \omega_5 PROD_i + \omega_6 SHENG_i + \omega_7 PSCR_i + \omega_8 LAB_i + \omega_9 L\_AGE_i + \omega_{10} L\_SIZE_{it} + \omega_{11} TER_{it} + \omega_{12} GL_i + \mu_{it} \quad (4)$$

$$RAP_{it} = \theta_0 + \theta_1 SI_i + \theta_2 SI_i^2 + \theta_3 ENV_i + \theta_4 SOC_i + \theta_5 GOV_i + \theta_6 PROD_i + \theta_7 SHENG_i + \theta_8 PSCR_i + \theta_9 LAB_i + \theta_{10} L\_AGE_i + \theta_{11} L\_SIZE_{it} + \theta_{12} TER_{it} + \theta_{13} GL_i + \mu_{it} \quad (5)$$

where

ENV_i is a dummy variable equal to 1 if the fund *i* focuses on environmental issues, and 0

otherwise;

SOC_i is a dummy variable equal to 1 if the fund *i* focuses on social issues, and 0 otherwise;

GOV_i is a dummy variable equal to 1 if the fund *i* focuses on governance issues, and 0 otherwise;

$PROD_i$ is a dummy variable equal to 1 if the fund *i* focuses on products' issues, and 0 otherwise;

$SHENG_i$ is a dummy variable equal to 1 if the fund *i* focuses on shareholder engagement issues, and 0 otherwise;

$PSCR_i$ is a dummy variable equal to 1 if the fund *i* employs a positive screening strategy, and 0 otherwise;

LAB_i is a dummy variable equal to 1 if the fund *i* has received at least one SRI label, and 0 otherwise.

Alternatively, to test hypothesis 4 introduced in section 3, we estimate the regressions replacing the variable SI by the number of sectoral screens (SECT), and the number of transversal screens (TRNV).

$$RAP_{it} = \delta_0 + \delta_1 SECT_i + \delta_2 ENV_i + \delta_3 SOC_i + \delta_4 GOV_i + \delta_5 PROD_i + \delta_6 SHENG_i + \delta_7 PSCR_i + \delta_8 LAB_i + \delta_9 L\_AGE_i + \delta_{10} L_{SIZE_{it}} + \delta_{11} TER_{it} + \delta_{12} GL_i + \mu_{it} \quad (6a)$$

$$RAP_{it} = \varphi_0 + \varphi_1 TRNV_i + \varphi_2 ENV_i + \varphi_3 SOC_i + \varphi_4 GOV_i + \varphi_5 PROD_i + \varphi_6 SHENG_i + \varphi_7 PSCR_i + \varphi_8 LAB_i + \varphi_9 L\_AGE_i + \varphi_{10} L\_SIZE_{it} + \varphi_{11} TER_{it} + \varphi_{12} GL_i + \mu_{it} \quad (6b)$$

$$RAP_{it} = \phi_0 + \phi_1 SECT_i + \phi_2 SECT_i^2 + \phi_3 ENV_i + \phi_4 SOC_i + \phi_5 GOV_i + \phi_6 PROD_i + \phi_7 SHENG_i + \phi_8 PSCR_i + \phi_9 LAB_i + \phi_{10} L\_AGE_i + \phi_{11} L\_SIZE_{it} + \phi_{12} TER_{it} + \phi_{13} GL_i + \mu_{it} \quad (7a)$$

$$RAP_{it} = \lambda_0 + \lambda_1 TRANSV_i + \lambda_2 TRANSV_i^2 + \lambda_3 ENV_i + \lambda_4 SOC_i + \lambda_5 GOV_i + \lambda_6 PROD_i + \lambda_7 SHENG_i + \lambda_8 PSCR_i + \lambda_9 LAB_i + \lambda_{10} L\_AGE_i + \lambda_{11} L\_SIZE_{it} + \lambda_{12} TER_{it} + \lambda_{13} GL_i + \mu_{it} \quad (7b)$$

Given the structure of our data (panel data) and similarly to Barnett and Salomon (2006), we include a fixed year effect (by introducing year dummies) and a random fund effect to control for factors that might correlate with the dependent variable, and that are not captured by our other variables. These effects allow us to model the individual units (funds) over time

(years) controlling for unobserved heterogeneity.

6. Empirical results

Table 5 shows some descriptive statistics and the correlation matrix concerning the main variables of our study.

[INSERT TABLE 5]

Interestingly, there is a negative correlation between the two main variables of the model ($\rho_{SI,RAP}$ = -0,0406). With the exception of shareholder engagement and governance screens ($\rho_{SHENG,GOV}$ = 0,7815), and differently than expected, there is also a low correlation between many of the social screens[42]. Furthermore, there is a negative relation between the screens related with products and the environment ($\rho_{PROD,ENV}$ = -0,2949).

Figures 4 and 5 illustrate the evolution of the average monthly risk-adjusted performance and the average screening intensity, respectively, for all funds included in our sample.

[INSERT FIGURES 4 AND 5]

Figure 4 shows a strong decline in the performance of SRI funds over the period 2003-2006. After 2006, performance increases, displaying positive values since 2011. Figure 5 exhibits a decrease in funds' screening intensity since 2006 up until 2011. After that, it becomes more stable.

Empirically, models 2 and 4 estimate a potential linear association between risk-adjusted performance and screening intensity, while models 3 and 5 evaluate the presence of a curvilinear effect. Models 3 and 5 add the social dummies (screens' type, positive screening, and labels) to the models 2 and 4, respectively.

Given the substantial heterogeneity between countries and regions, we will differentiate the analysis according to the following groups/individual countries: Global (US and European countries), Europe, US, United Kingdom, Austria, Belgium, France, Germany, Luxembourg,

[42] Since high correlations between the variables may induce multicollinearity, this problem is somewhat mitigated.

Switzerland, and Scandinavia [43] (Denmark, Norway, and Sweden).We exclude Italy and Netherlands due to their small representativeness on the sample.

When we consider the whole sample (table 6), we find different signs for the hypothesis of linear relationship between financial performance and screening intensity, namely a positive sign in model 2 and a negative sign in model 4. After the introduction of the squared screening intensity term, the coefficient for screening intensity becomes positive in both models. With respect to the square of the screening intensity, we obtain neutral coefficients in models 3 and 5. Nevertheless, the results are not statistically significant. In terms of screening types, the results are mixed, and without statistical significance. For example, governance-screened funds have a positive coefficient, while screening on the basis of products shows a negative coefficient. Differently, we find a negative and statistically significant coefficient for the positive screening strategy, i.e. positive screens weaken financial performance. Regarding the differentiation through SRI labels, we find a positive but not statistically significant coefficient.

[INSERT TABLE 6]

Focusing the analysis on the European countries as a whole (table 7), when we estimate a linear relationship between the number of screens and returns, the coefficients are positive and without statistical significance. When the screening intensity squared term is introduced, the coefficients for the screening intensity show a negative sign, the coefficients for the squared term are positive, and neither of them is statistically significant. Furthermore, we find no evidence of specific screens, positive screens, or SRI labels systematically affecting performance. These results are in line with Laurel (2011), who find no relationship between screening intensity and financial performance for a European context, neither linear nor curvilinear.

[INSERT TABLE 7]

Table 8 shows the regression results for US funds. Interestingly, the results show that most of the variables considered have a significant impact on the financial performance of SRI funds. We find evidence that the performance an US SRI fund investor can expect is dependent on the number and type of screens employed by the funds. For a significance level of 1%, the

[43] The strong similarities between Scandinavian countries justifies its aggregation into one group.

findings in model 5 suggest there is a positive relationship between screening intensity and risk-adjusted returns, and a negative relationship between squared screening intensity and risk-adjusted returns. This means that the financial performance increases at first as the number of screens increases, but then declines continuously until it reaches the maximum screening intensity. Still, at the maximum of 16 screens, performance is superior to the level of funds with one screen. Therefore, unlike Barnett and Salomon (2006), who find that the risk-adjusted performance starts to decrease as the number of screens increases, and then recovers, we conclude for an inverted curvilinear (U-shaped) effect. From table 8, it is also evident that some screening strategies significantly influence the financial performance of US SRI funds. Similar to Barnett and Salomon (2006), funds that screen on the basis of environmental criteria have a relatively lower performance. Products-oriented screens also have a negative effect on performance, while screening on governance, in contrast with Renneboog *et al.* (2008b), generates a relatively stronger financial performance. Additionally, the use of positive screening strategies seems to penalize funds.

[INSERT TABLE 8]

Table 9 presents the regression results for UK funds only. There is a negative linear relationship between screening intensity and performance for a significance level of 5%, i.e. the financial performance of UK funds decreases as the number of screens increases. Both ESG-type and screening strategies tend to exhibit positive and not significant coefficients. However, in model 4, the dummy Products is positive and statistically significant at the 10% level, meaning that non-sinful investing does not detract performance.

[INSERT TABLE 9]

In order to derive a more comprehensive picture of the relationship between screens and performance, we examine the determinants of SRI fund performance in Austria, Belgium, France, Germany, Luxembourg, and Switzerland individually (tables 10 to 15). The results show no evidence to suggest that the screening processes of SRI funds have a linear or curvilinear effect on performance. The empirical results are mixed and not statistically significant.

[INSERT TABLES 10 TO 15]

Finally, for Scandinavia, the findings show a U-shaped curvilinear relationship – there is a negative (positive) and statistically significant coefficient associated with the screening intensity (squared screening intensity). The financial performance initially decreases as the number of screens increases but then starts to rise until it reaches the maximum screening intensity. The social dummies exhibit mixed signals, but none of them are significant.

[INSERT TABLE 16]

In relation to the control variables, some results provide interesting insights, namely concerning the variables Size and Total Expense Ratio. For the global sample, as well as for the European and United Kingdom subsamples, the Size and the Total Expense Ratio variables exhibit positive and statistically significant coefficients. This means that larger SRI funds may benefit from better financial returns, and also that the total costs involved annually for SRI funds do not seem to decrease SRI funds' financial performance.

The geographic dummy variable has a negative coefficient and is statistically significant for the global sample and for the US, meaning that international mutual funds perform worse than funds with a purely domestic investment orientation. For US and Swiss funds, and similar to Renneboog *et al.* (2008b), our results also show that fund age negatively affects performance.

In order to test hypothesis 4, as in Capelle-Blancard and Monjon (2014), we proceed to the replacement of the total screening intensity by the number of sectoral and transversal screens. Overall, the coefficients preserve the same trend of signal and statistical significance.

To ensure the robustness of our results, we performed several sensitivity analyses. Like Barnett and Salomon (2006), we added each social variable (ENV, SOC, GOV, PROD, SHENG, PSCR, and LAB) in different orders and separately into the regressions. The results did not change substantially. Since extreme values of the observed variables can distort estimates of the regressions' coefficients, we proceed to the detection of outliers graphically. Only one point whose value differed substantively from the other observations was excluded – September 2011 from the French fund LBPAM Responsible Actions Europe (ISIN FR0010940882). The main results persist for the samples affected.

We also dropped those funds that reported extreme screening intensity values (fewer than 4 and greater than 12) to test for other influential points. Some results concerning the global sample, Scandinavia, and the UK differ from those previously obtained. For UK and

Scandinavian funds, the coefficients for Screening Intensity (UK and Scandinavia) and squared Screening Intensity (Scandinavia) lose significance. Regarding the global sample, the coefficient of the variable Screening Intensity is now positive and statistically significant at 1%, and some social variables (SOC, GOV, PROD and SHENG) become significant.

Finally, like Barnett and Salomon (2006), we split the sample into low (1-4 screens), medium (5-12 screens), and high (13-16 screens) screening intensity subsets to decompose the screening patterns of the funds. The results remain unchanged except for the global sample, US, UK, and Belgium. The results for US funds hold for the medium sub-sample, while the results for the UK funds hold for the low sample. Belgium also exhibits differences for the low screening level: Belgian SRI funds show, for a significance level of 1%, a negative coefficient for the extent of screening. With regard to the global sample, the differences are manifested at the medium level, and explained in the previous paragraph.

7. Conclusions

Researchers often claim that evidence on the impact of aligning social and financial objectives in the performance of investment portfolios is unclear, questionable, or inconsistent. This study contributes to the literature by investigating the relationship between the risk-adjusted performance and the screening activities of a dataset of 330 US and European SRI mutual funds for the period 2003-2014.

In general, our results are consistent with the SRI literature in the sense that there does not seem to be a financial sacrifice for investors in highly screened funds. In particular, our study extends previous academic research that investigates the heterogeneity within socially screened funds by exploring the impact of the number and type of the SRI screens on financial returns, the effects of using positive screening techniques as well as sectoral/transversal screens and the potential of SRI labels to generate distinct patterns of risk-adjusted returns.

Considering the global sample, and European countries as a group and individually (except the UK), our findings suggest that there is no relationship between the number of screens and financial performance. For US SRI funds, we find an inverted U-shaped pattern between SRI financial performance and screening intensity. Conversely, Scandinavian funds support the shape of the curvilinear relationship illustrated by Barnett and Salomon (2006). We interpret these findings as indicative that portfolio theory and stakeholder theory are actually complementary, instead of conflicting. Differently, for UK SRI funds, there is a linear negative relationship between screening intensity and financial performance.

When we incorporate qualitative differences on screening policies, we find some relationship between returns and particular screen for the US and UK. For the US, we find that screening for governance has a positive effect on performance, while excluding firms with excessive negative environmental impact has a negative effect on performance. Interestingly, the results also show that screening for products (alcohol, gambling, tobacco, among others) impacts returns negatively. This conclusion is in line with the empirical literature that finds that "sin" stocks have higher expected returns than otherwise comparable stocks. Differently, the results for UK SRI funds show that the higher the number of screens on products, the higher the positive impact on returns.

For the global sample and the US, our main results also indicate that when funds meet superior ESG standards, the financial perspective is affected – positive screens provide lower performance than a negative screening strategy. While most studies offer results favorable to positive screening techniques (e.g. Goldreyer *et al*., 1999; Humphrey and Lee, 2011; Trinks and Scholtens, 2015), this evidence is consistent with Auer (2016), who shows that portfolios formed on the basis of negative screens significantly outperform a passive benchmark strategy. In this sense, our results concerning positive vs. negative screens are mixed, namely for US funds: the exclusion of "sin" stocks has a negative impact on performance, but the consideration of positive screens has the same effect.

Finally, our evidence indicates that, for the global sample and the US, investing in international funds, does not pay financially: investing domestically seems to have a financial advantage. We also document that the funds' size and costs do not erode financial performance, whilst the age has the opposite effect for US and Swiss funds – older funds have lower financial returns.

There are several reasons why we should expect contrasts in the way responsible investment affects performance in different countries/regions. Sandberg *et al.* (2009) suggest that are three kind of explanations for the heterogeneity in the SRI funds, namely: a) cultural and ideological differences between regions and countries; b) differences in values, norms and ideology between different actors involved in the SRI process (SRI stakeholders); and c) the market setting in which SRI actors operate. We illustrate this statement: the empirical evidence for the 13 countries in our sample is mixed, and the results are not geographically homogeneous. Each country/region (e.g., Scandinavia) has a unique social, political, legal, institutional context that determines the degree of development of the SRI market and, consequently, the outline of the relationship between social screening and financial returns.

In fact, there is no clear trend in the literature about the existence and nature of the relationship between social screens and financial performance in a given country. Geographically, evidence to date is quite limited: Barnett and Salomon (2006) and Lee *et al*. (2010) focus on US funds, Biehl and Hoepner (2010) study UK funds, Humphrey and Lee (2011) examine Australian funds, Laurel (2011) analyzes European funds, Capelle-Blancard and Monjon (2014) evaluate French funds and, finally, Renneboog *et al.* (2008) consider funds from Europe, North America and Asia-Pacific (although on an aggregate level only). Clearly, additional research is needed in order to get a more complete picture on this subject.

Another relevant issue concerns the consequences of the global financial crisis of 2008 on SRI. This event might have changed investors' perception and awareness concerning SRI practices, but most studies on the relationship between screening and performance do not consider 2008 and subsequent years. For example, Barnett and Salomon (2006) and Lee *et al.* (2010), that show a curvilinear (U-shaped) and negative relationship between screening and returns for US funds, respectively, look at periods prior to this event. Differently, we find an inverted U-shaped effect but considering the period from 2003 to 2014. The effects of the international financial crisis may contribute to explain the different results of this study.

It is worth mentioning that the methodology used to assess fund performance and investment styles is crucial in analyzing whether and how screening effects SRI fund performance. By way of example, Barnett and Salomon (2006) employ the CAPM- based one factor model to estimate the performance of stock and bond funds. The model used – CAPM – to compute risk-adjusted performance does not capture time-varying risks. Besides that, the authors did not include specific risk factors for bond funds, and estimate the risk-adjusted performance of all funds using the S&P 500 as benchmark. In this paper, we focus on equity funds, and the risk-adjusted returns are computed on the basis of the Carhart (1997) four-factor model in a 36 months rolling basis, thereby considering time-varying risk.

In light of the differences concerning the time period under analysis, methodologies used for assessing risk-adjusted performance and geographic regions of focus analysed, research on the relationship between the screening characteristics and the financial performance is still a work in progress. Yet, our paper contributes to the ongoing research providing relevant findings concerning two world leaders in terms of socially responsible finance and investing (US and UK), as well as other European countries, including one of the first regions to introduce regulatory requirements and standards regarding ESG issues (Scandinavia).

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Table 1 - Studies on the impact of screening on financial performance

This table briefly summarizes data information, methodology, and empirical results of the main studies on the relationship between screening and SRI fund performance.

	Number of SRI funds	*Geographic Focus*	*Period*	*Methodology for evaluating performance*	*Main results/conclusions*
Barnett and Salomon (2006)	61	US	1972-2000	CAPM	Curvilinear relationship between social screens and financial performance; some types of social screens are linked to a higher financial performance.
Renneboog et al. (2008b)	440	Europe, North America, Asia-Pacific (17 countries)	1991-2003	CAPM; Fama and French (1993); Carhart (1997)	High screening intensity constrains the risk-return optimization; the SRI screening activities matter.
Biehl and Hoepner (2010)	50	UK	1998-2010	CAPM; Fama and French (1993); Carhart (1997)	Portfolios with the highest social rating underperform; no systematic relationship between ethical and financial performance.
Lee et al. (2010)	61	US	1989-2006	Carhart (1997)	Negative (curvilinear) relationship between performance (systematic risk) and screening intensity.
Humphrey and Lee (2011)	24	Australia	1996-2008	Fama and French (1993); Carhart (1997)	Weak evidence that more highly screened portfolios offer higher risk-adjusted returns; positive (negative) screening reduces (increases) funds' risk.
Laurel (2011)	177	Europe (14 countries)	1980-2010	CAPM	Screening intensity has no effect on returns but has a curvilinear effect on risk.
Capelle-Blancard and Monjon (2014)	116	France	2004-2007	CAPM	Screening intensity reduces financial performance; only sectoral screens decrease financial performance.

Table 2 - Descriptive statistics of risk-adjusted returns by country

This table presents mean, standard deviation, minimum and maximum values, and number of observations (N) for each country of our sample from 2003 to 2014.

	Mean	Std. Dev.	Min	Max	N
Austria	-0,085271	0,154737	-1,050832	2,165533	2106
Belgium	-0,109174	0,155434	-0,710921	0,216396	1706
Denmark	-0,066106	0,138376	-0,662019	0,157612	263
France	-0,093226	0,399567	-19,482880	10,179470	5895
Germany	-0,077443	0,173879	-1,250198	3,555045	1810
Italy	-0,116044	0,153365	-0,487271	0,142134	144
Luxembourg	-0,747712	0,142145	-0,742347	0,270124	1744
Netherlands	-0,093092	0,147459	-0,486076	0,191983	994
Norway	-0,074701	0,151730	-0,513114	0,257642	426
Sweden	-0,045755	0,163660	-2,938844	0,265552	916
Switzerland	-0,075192	0,188964	-6,916366	1,535203	6156
United Kingdom	-0,946396	0,203831	-5,049177	3,370219	3610
United States of America	-0,901901	0,225693	-7,463277	4,277121	8972

Table 3 - Screening features of US and European SRI funds

This table summarizes SRI funds (US, European and total) based on screening type (environment, social, governance, products and shareholder engagement), nature (transversal and sectoral) and strategy (positive), and also by labels.

	Percentage of funds		
Characteristics	*US funds*	*European funds*	*Total sample*
Environment	65,00%	53,20%	**56%**
Social	68,75%	44,00%	**50%**
Governance	35,00%	0,80%	**9%**
Products	82,50%	70,40%	**73%**
Shareholder engagement	40,00%	0,00%	**10%**
Transversal	68,75%	44,40%	**50%**
Sectoral	96,25%	96,00%	**96%**
Positive screening	42,50%	53,60%	**51%**
Labels	38,75%	76,40%	**67%**

Table 4 - Control variables of SRI mutual funds (by country)

This table presents funds' control variables averaged by country for the period 2003-2014. Control variables include: Age, measured as the number of months since the fund's inception; Size, measured by fund's total net assets in million US dollars; and Total Expense Ratio, in percentage.

Country	**Age** (months)	**Size** (million USD)	**Total Expense Ratio** (%)
Austria	122	22,97	1,76
Belgium	168	690,72	1,60
Denmark	151	109,54	1,74
France	149	95,11	1,54
Germany	114	88,76	1,74
Italy	210	198,58	2,02
Luxembourg	142	72,29	1,93
Netherlands	146	120,01	1,67
Norway	249	1392,90	1,24
Sweden	198	1195,95	1,34
Switzerland	108	114,54	1,78
UK	185	156,13	1,56
US	163	1313,29	1,23

Table 5 - Descriptive statistics and correlation matrix

This table reports the pairwise correlations and the descriptive statistics (mean, standard deviation, minimum and maximum) of fund variables. The financial variable is the risk-adjusted performance (RAP), and the social variables include: screening intensity (SI), types of screening – environment (ENV), social (SOC), governance (GOV), products (PROD), and shareholder engagement (SHENG) –, positive screening strategy (PSCR), and labels (LAB). Control variables include: the logarithm of the variable Age, measured as the number of months since the fund's inception (L_AGE); the logarithm of the variable Size, measured by fund's total net assets in million US dollars (L_SIZE); and Total Expense Ratio, in percentage (TER).

	RAP	SI	ENV	SOC	GOV	PROD	SHENG	PSCR	LAB	L_AGE	L_SIZE	TER	GL
RAP	1,0000												
SI	-0,0406	1,0000											
ENV	0,0158	0,4839	1,0000										
SOC	-0,0324	0,6343	0,2469	1,0000									
GOV	-0,0327	0,6918	0,3005	0,2937	1,0000								
PROD	-0,0553	0,3880	-0,2949	0,2318	0,1486	1,0000							
SHENG	-0,0250	0,7051	0,3132	0,3223	0,7815	0,1560	1,0000						
PSCR	0,0359	0,1668	0,6818	0,1274	0,1771	-0,5283	0,1036	1,0000					
LAB	-0,0218	-0,0522	-0,0707	0,0808	-0,0278	0,0403	-0,0741	0,0230	1,0000				
L_AGE	-0,1880	0,0924	-0,1226	0,0931	0,0890	0,1785	0,0664	-0,2013	0,0555	1,0000			
L_SIZE	-0,0461	0,0769	-0,0319	-0,0022	0,1557	0,0764	0,0612	-0,0284	0,0257	0,4201	1,0000		
TER	-0,0363	-0,0998	0,1658	-0,0465	-0,1634	-0,1253	-0,1274	0,1830	0,1127	-0,1721	-0,2211	1,0000	
GL	0,0649	-0,0824	0,1983	-0,1249	-0,1775	-0,1486	-0,1719	0,1786	-0,0211	-0,3220	-0,1603	0,2653	1,0000
Mean	-0,0863	5,0990	0,5436	0,5173	0,1065	0,7629	0,1068	0,4836	0,6946	4,9963	3,7724	1,5458	0,5003
Std. Dev.	0,2409	4,1364	0,4981	0,4997	0,3085	0,4253	0,3089	0,4997	0,4606	0,5241	2,0695	0,6538	0,5000
Min	-19,4829	1	0	0	0	0	0	0	0	3,6109	-9,2103	0	0
Max	10,1795	16	1	1	1	1	1	1	1	6,2226	11,1987	9,8	1

Table 6 - Regression results for the global sample

This table reports the results from regressions of financial performance on a number of social and control variables. The dependent variable is the risk-adjusted performance (RAP) associated with SRI funds. Explanatory variables include *Screening Intensity*, defined as the number of screens used, and its square (*Squared Screening Intensity)*, and the following dummy variables: *Environment, Social, Governance, Products, Shareholder Engagement*, which take a value of 1 if the fund focuses on environmental, social, governance, products, shareholder engagement, respectively, and 0 otherwise; *Positive Screening* is a dummy variable equal to 1 if the fund employs a positive screening strategy, and 0 otherwise; *Labels* is a dummy variable equal to 1 if the fund has received at least one SRI label, and 0 otherwise. Control variables include: *Size*, measured by Log fund's total net assets (in millions of US dollars); *Age*, measured as the Log of the number of months since the fund's inception; *Total Expense Ratio* is a measure of the total costs associated with managing and operating an investment fund; *Global* is a dummy variable that takes the value of 1 if the fund invests internationally, and 0 otherwise. The sample includes 330 SRI equity mutual funds for the period 2003-2014. t-statistics are shown in parentheses.
** p-value < 0,10; ** p-value < 0,05; *** p-value < 0,01*

	Global			
	Model (2)	**Model (3)**	**Model (4)**	**Model (5)**
Constant	-0,0018 (-0,16)	-0,0023 (-0,21)	0,0028 (0,25)	0,0011 (0,10)
Screening Intensity	0,0003 (1,24)	0,0007 (0,74)	-0,0001 (-0,12)	0,0010 (0,73)
Squared Screening Intensity		0,0000 (-0,41)		-0,0001 (-0,88)
Dummy_Environment			0,0004 (0,10)	-0,0006 (-0,15)
Dummy_Social			0,0030 (1,04)	0,0020 (0,67)
Dummy_Governance			0,0050 (0,87)	0,0068 (1,12)
Dummy_Products			-0,0013 (-0,36)	-0,0021 (-0,56)
Dummy_Shareholder Engagement			0,0017 (0,29)	0,0039 (0,63)
Dummy_Positive Screening			-0,0060* (-1,85)	-0,0055* (-1,68)
Dummy_Labels			0,0026 (1,17)	0,0025 (1,15)
Log Age	-0,0007 (-0,33)	-0,0008 (-0,34)	-0,0016 (-0,70)	-0,0015 (-0,65)
Log Size	0,0014*** (2,67)	0,0014*** (2,67)	0,0014*** (2,74)	0,0014*** (2,64)
Total Expense Ratio	0,0025* (1,76)	0,0024* (1,72)	0,0028** (1,98)	0,0028* (1,93)
Dummy_Global	-0,0038* (-1,74)	-0,0040* (-1,77)	-0,0025 (-1,10)	-0,0026 (-1,15)
Fixed Effects	Included			
Random Effects	Included			
Number of observations	30960			
Number of mutual funds	330			
R-squared within	0,5019	0,5019	0,5019	0,5019
R-squared between	0,8779	0,8780	0,8833	0,8840
R-squared overall	0,5343	0,5343	0,5344	0,5344

Table 7 - Regression results for European funds

This table reports the results from regressions of financial performance on a number of social and control variables. The dependent variable is the risk-adjusted performance (RAP) associated with SRI funds. Explanatory variables include *Screening Intensity*, defined as the number of screens used, and its square (*Squared Screening Intensity)*, and the following dummy variables: *Environment, Social, Governance, Products, Shareholder Engagement*, which take a value of 1 if the fund focuses on environmental, social, governance, products, shareholder engagement, respectively, and 0 otherwise; *Positive Screening* is a dummy variable equal to 1 if the fund employs a positive screening strategy, and 0 otherwise; *Labels* is a dummy variable equal to 1 if the fund has received at least one SRI label, and 0 otherwise. Control variables include: *Size*, measured by Log fund's total net assets (in millions of US dollars); *Age*, measured as the Log of the number of months since the fund's inception; *Total Expense Ratio* is a measure of the total costs associated with managing and operating an investment fund; *Global* is a dummy variable that takes the value of 1 if the fund invests internationally, and 0 otherwise. The subsample includes 250 SRI equity mutual funds for the period 2003-2014. t-statistics are shown in parentheses.
** p-value < 0,10; ** p-value < 0,05; *** p-value < 0,01*

	Europe			
	Model (2)	**Model (3)**	**Model (4)**	**Model (5)**
Constant	-0,0121 (-1,13)	-0,0110 (-1,00)	-0,0130 (-1,11)	-0,0095 (-0,78)
Screening Intensity	0,0001 (0,25)	-0,0006 (-0,45)	0,0000 (0,02)	-0,0013 (-0,85)
Squared Screening Intensity		0,0001 (0,54)		0,0001 (0,94)
Dummy_Environment			-0,0020 (-0,51)	-0,0014 (-0,36)
Dummy_Social			0,0005 (0,17)	0,0010 (0,34)
Dummy_Governance			-0,0008 (-0,09)	-0,0004 (-0,04)
Dummy_Products			0,0020 (0,57)	0,0019 (0,53)
Dummy_Shareholder Engagement			(omitted)	(omitted)
Dummy_Positive Screening			0,0004 (0,12)	-0,0009 (-0,22)
Dummy_Labels			0,0016 (0,68)	0,0016 (0,66)
Log Age	0,0010 (0,47)	0,0010 (0,46)	0,0006 (0,28)	0,0004 (0,17)
Log Size	0,0016*** (3,15)	0,0016*** (3,17)	0,0016*** (3,03)	0,0017*** (3,11)
Total Expense Ratio	0,0026* (1,93)	0,0027** (1,98)	0,0029** (2,08)	0,0030** (2,18)
Dummy_Global	-0,0028 (-1,38)	-0,0028 (-1,38)	-0,0019 (-0,88)	-0,0018 (-0,85)
Fixed Effects	Included			
Random Effects	Included			
Number of observations	22311			
Number of mutual funds	250			
R-squared within	0,4918	0,4918	0,4918	0,4918
R-squared between	0,9090	0,9091	0,9101	0,9106
R-squared overall	0,5287	0,5287	0,5287	0,5288

Table 8 - Regression results for US funds

This table reports the results from regressions of financial performance on a number of social and control variables. The dependent variable is the risk-adjusted performance (RAP) associated with SRI funds. Explanatory variables include *Screening Intensity*, defined as the number of screens used, and its square (*Squared Screening Intensity)*, and the following dummy variables: *Environment, Social, Governance, Products, Shareholder Engagement*, which take a value of 1 if the fund focuses on environmental, social, governance, products, shareholder engagement, respectively, and 0 otherwise; *Positive Screening* is a dummy variable equal to 1 if the fund employs a positive screening strategy, and 0 otherwise; *Labels* is a dummy variable equal to 1 if the fund has received at least one SRI label, and 0 otherwise. Control variables include: *Size*, measured by Log fund's total net assets (in millions of US dollars); *Age*, measured as the Log of the number of months since the fund's inception; *Total Expense Ratio* is a measure of the total costs associated with managing and operating an investment fund; *Global* is a dummy variable that takes the value of 1 if the fund invests internationally, and 0 otherwise. The subsample includes 80 SRI equity mutual funds for the period 2003-2014. t-statistics are shown in parentheses.
** p-value < 0,10; ** p-value < 0,05; *** p-value < 0,01*

	United States of America			
	Model (2)	**Model (3)**	**Model (4)**	**Model (5)**
Constant	0,0345 (1,16)	0,0205 (0,64)	0,0852*** (2,77)	0,0614** (2,08)
Screening Intensity	0,0004 (0,84)	0,0037 (1,32)	-0,0010 (-0,68)	0,0127*** (2,90)
Squared Screening Intensity		-0,0002 (-1,19)		-0,0007*** (-3,28)
Dummy_Environment			-0,0053 (-0,59)	-0,0288*** (-2,61)
Dummy_Social			-0,0004 (-0,05)	-0,0117 (-1,44)
Dummy_Governance			0,0298** (2,55)	0,0369*** (3,31)
Dummy_Products			-0,0220** (-2,01)	-0,0466*** (-3,63)
Dummy_Shareholder Engagement			0,0084 (0,89)	0,0138 (1,57)
Dummy_Positive Screening			-0,0267*** (-3,50)	-0,0264*** (-3,72)
Dummy_Labels			0,0078 (1,25)	0,0080 (1,37)
Log Age	-0,0054 (-0,88)	-0,0044 (-0,70)	-0,0099* (-1,70)	-0,0058 (-1,04)
Log Size	0,0003 (0,23)	0,0003 (0,24)	0,0004 (0,32)	0,0001 (0,11)
Total Expense Ratio	-0,0011 (-0,21)	-0,0012 (-0,22)	-0,0017 (-0,32)	-0,0021 (-0,41)
Dummy_Global	-0,0068 (-0,91)	-0,0054 (-0,73)	-0,0111 (-1,57)	-0,0119* (-1,81)
Fixed Effects	Included			
Random Effects	Included			
Number of observations	8649			
Number of mutual funds	80			
R-squared within	0,5273	0,5273	0,5273	0,5273
R-squared between	0,8085	0,8137	0,8630	0,8907
R-squared overall	0,5493	0,5493	0,5502	0,5512

Table 9 - Regression results for UK funds

This table reports the results from regressions of financial performance on a number of social and control variables. The dependent variable is the risk-adjusted performance (RAP) associated with SRI funds. Explanatory variables include *Screening Intensity*, defined as the number of screens used, and its square (*Squared Screening Intensity)*, and the following dummy variables: *Environment, Social, Governance, Products, Shareholder Engagement*, which take a value of 1 if the fund focuses on environmental, social, governance, products, shareholder engagement, respectively, and 0 otherwise; *Positive Screening* is a dummy variable equal to 1 if the fund employs a positive screening strategy, and 0 otherwise; *Labels* is a dummy variable equal to 1 if the fund has received at least one SRI label, and 0 otherwise. Control variables include: *Size*, measured by Log fund's total net assets (in millions of US dollars); *Age*, measured as the Log of the number of months since the fund's inception; *Total Expense Ratio* is a measure of the total costs associated with managing and operating an investment fund; *Global* is a dummy variable that takes the value of 1 if the fund invests internationally, and 0 otherwise. The subsample includes 33 SRI equity mutual funds for the period 2003-2014. t-statistics are shown in parentheses.
** p-value < 0,10; ** p-value < 0,05; *** p-value < 0,01*

	United Kingdom			
	Model (2)	**Model (3)**	**Model (4)**	**Model (5)**
Constant	-0,0742 (-1,45)	-0,0678 (-1,24)	-0,0631 (-1,09)	-0,0091 (-0,14)
Screening Intensity	-0,0009 (-0,39)	-0,0041 (-0,53)	-0,0112** (-2,15)	-0,0248** (-2,53)
Squared Screening Intensity		0,0003 (0,44)		0,0013 (1,63)
Dummy_Environment			0,0181 (0,76)	0,0167 (0,75)
Dummy_Social			0,0173 (0,95)	0,0207 (1,20)
Dummy_Governance			(omitted)	(omitted)
Dummy_Products			0,0785* (1,86)	0,0623 (1,53)
Dummy_Shareholder Engagement			(omitted)	(omitted)
Dummy_Positive Screening			0,0096 (0,33)	-0,0123 (-0,41)
Dummy_Labels			0,0151 (0,84)	0,0233 (1,30)
Log Age	0,0050 (0,52)	0,0049 (0,49)	-0,0073 (-0,62)	-0,0096 (-0,85)
Log Size	0,0068** (2,80)	0,0068*** (2,76)	0,0074*** (2,78)	0,0071*** (2,77)
Total Expense Ratio	0,0101** (2,41)	0,0103** (2,43)	0,0129*** (2,93)	0,0128*** (2,94)
Dummy_Global	-0,0096 (-0,74)	-0,0101 (-0,76)	-0,0027 (-0,19)	-0,0070 (-0,51)
Fixed Effects	Included			
Random Effects	Included			
Number of observations	3225			
Number of mutual funds	33			
R-squared within	0,4059	0,4059	0,4060	0,4060
R-squared between	0,6035	0,6038	0,6977	0,7155
R-squared overall	0,4175	0,4177	0,4199	0,4214

Table 10 - Regression results for Austrian funds

This table reports the results from regressions of financial performance on a number of social and control variables. The dependent variable is the risk-adjusted performance (RAP) associated with SRI funds. Explanatory variables include *Screening Intensity*, defined as the number of screens used, and its square (*Squared Screening Intensity)*, and the following dummy variables: *Environment, Social, Governance, Products, Shareholder Engagement*, which take a value of 1 if the fund focuses on environmental, social, governance, products, shareholder engagement, respectively, and 0 otherwise; *Positive Screening* is a dummy variable equal to 1 if the fund employs a positive screening strategy, and 0 otherwise; *Labels* is a dummy variable equal to 1 if the fund has received at least one SRI label, and 0 otherwise. Control variables include: *Size*, measured by Log fund's total net assets (in millions of US dollars); *Age*, measured as the Log of the number of months since the fund's inception; *Total Expense Ratio* is a measure of the total costs associated with managing and operating an investment fund; *Global* is a dummy variable that takes the value of 1 if the fund invests internationally, and 0 otherwise. The subsample includes 19 SRI equity mutual funds for the period 2003-2014. t-statistics are shown in parentheses.
** p-value < 0,10; ** p-value < 0,05; *** p-value < 0,01*

	Austria			
	Model (2)	**Model (3)**	**Model (4)**	**Model (5)**
Constant	0,0136 (0,46)	0,0130 (0,43)	0,0106 (0,29)	0,0159 (0,40)
Screening Intensity	0,0006 (0,89)	0,0001 (0,04)	0,0009 (0,37)	0,0048 (0,41)
Squared Screening Intensity		0,0001 (0,17)		-0,0004 (-0,34)
Dummy_Environment			-0,0001 (-0,02)	0,0029 (0,24)
Dummy_Social			0,0116 (0,67)	0,0090 (0,48)
Dummy_Governance			(omitted)	(omitted)
Dummy_Products			-0,0104 (-0,81)	-0,0133 (-0,87)
Dummy_Shareholder Engagement			(omitted)	(omitted)
Dummy_Positive Screening			0,0059 (0,36)	0,0031 (0,17)
Dummy_Labels			0,0043 (0,56)	0,0058 (0,65)
Log Age	-0,0025 (-0,42)	-0,0021 (-0,33)	-0,0029 (-0,45)	-0,0051 (-0,56)
Log Size	-0,0002 (-0,25)	-0,0003 (-0,30)	-0,0008 (-0,65)	-0,0007 (-0,51)
Total Expense Ratio	0,0003 (0,09)	0,0004 (0,09)	0,0005 (0,11)	-0,0002 (-0,04)
Dummy_Global	-0,0001 (-0,02)	-0,0005 (-0,10)	-0,0009 (-0,16)	-0,0003 (-0,04)
Fixed Effects	Included			
Random Effects	Included			
Number of observations	1830			
Number of mutual funds	19			
R-squared within	0,7303	0,7303	0,7303	0,7303
R-squared between	0,9950	0,9949	0,9958	0,9960
R-squared overall	0,7644	0,7644	0,7645	0,7645

Table 11 - Regression results for Belgian funds

This table reports the results from regressions of financial performance on a number of social and control variables. The dependent variable is the risk-adjusted performance (RAP) associated with SRI funds. Explanatory variables include *Screening Intensity*, defined as the number of screens used, and its square (*Squared Screening Intensity)*, and the following dummy variables: *Environment, Social, Governance, Products, Shareholder Engagement*, which take a value of 1 if the fund focuses on environmental, social, governance, products, shareholder engagement, respectively, and 0 otherwise; *Positive Screening* is a dummy variable equal to 1 if the fund employs a positive screening strategy, and 0 otherwise; *Labels* is a dummy variable equal to 1 if the fund has received at least one SRI label, and 0 otherwise. Control variables include: *Size*, measured by Log fund's total net assets (in millions of US dollars); *Age*, measured as the Log of the number of months since the fund's inception; *Total Expense Ratio* is a measure of the total costs associated with managing and operating an investment fund; *Global* is a dummy variable that takes the value of 1 if the fund invests internationally, and 0 otherwise. The subsample includes 13 SRI equity mutual funds for the period 2003-2014. t-statistics are shown in parentheses.
** p-value < 0,10; ** p-value < 0,05; *** p-value < 0,01*

	Belgium			
	Model (2)	**Model (3)**	**Model (4)**	**Model (5)**
Constant	0,0103 (0,31)	0,0135 (0,37)	0,0134 (0,36)	-0,0287 (-0,31)
Screening Intensity	-0,0003 (-0,33)	-0,0014 (-0,25)	0,0001 (0,08)	0,0147 (0,50)
Squared Screening Intensity		0,0001 (0,20)		-0,0008 (-0,50)
Dummy_Environment			(omitted)	(omitted)
Dummy_Social			-0,0042 (-0,37)	-0,0246 (-0,58)
Dummy_Governance			(omitted)	(omitted)
Dummy_Products			0,0025 (0,10)	-0,0078 (-0,24)
Dummy_Shareholder Engagement			(omitted)	(omitted)
Dummy_Positive Screening			(omitted)	(omitted)
Dummy_Labels			-0,0006 (-0,13)	0,0006 (0,10)
Log Age	-0,0012 (-0,19)	-0,0011 (-0,19)	-0,0025 (-0,27)	-0,0018 (-0,19)
Log Size	0,0004 (0,41)	0,0004 (0,40)	0,0004 (0,48)	0,0009 (0,69)
Total Expense Ratio	0,0013 (0,24)	0,0014 (0,24)	0,0020 (0,29)	0,0030 (0,40)
Dummy_Global	-0,0024 (-0,51)	-0,0023 (-0,48)	-0,0024 (-0,47)	-0,0028 (-0,55)
Fixed Effects	Included			
Random Effects	Included			
Number of observations	1667			
Number of mutual funds	13			
R-squared within	0,7827	0,7827	0,7827	0,7827
R-squared between	0,9969	0,9969	0,9971	0,9973
R-squared overall	0,7868	0,7868	0,7868	0,7869

Table 12 - Regression results for French funds

This table reports the results from regressions of financial performance on a number of social and control variables. The dependent variable is the risk-adjusted performance (RAP) associated with SRI funds. Explanatory variables include *Screening Intensity*, defined as the number of screens used, and its square (*Squared Screening Intensity)*, and the following dummy variables: *Environment, Social, Governance, Products, Shareholder Engagement*, which take a value of 1 if the fund focuses on environmental, social, governance, products, shareholder engagement, respectively, and 0 otherwise; *Positive Screening* is a dummy variable equal to 1 if the fund employs a positive screening strategy, and 0 otherwise; *Labels* is a dummy variable equal to 1 if the fund has received at least one SRI label, and 0 otherwise. Control variables include: *Size*, measured by Log fund's total net assets (in millions of US dollars); *Age*, measured as the Log of the number of months since the fund's inception; *Total Expense Ratio* is a measure of the total costs associated with managing and operating an investment fund; *Global* is a dummy variable that takes the value of 1 if the fund invests internationally, and 0 otherwise. The subsample includes 54 SRI equity mutual funds for the period 2003-2014. t-statistics are shown in parentheses.
** p-value < 0,10; ** p-value < 0,05; *** p-value < 0,01*

	France			
	Model (2)	**Model (3)**	**Model (4)**	**Model (5)**
Constant	-0,0228 (-0,71)	-0,0224 (-0,67)	-0,0221 (-0,60)	-0,0227 (-0,56)
Screening Intensity	0,0006 (0,52)	0,0004 (0,09)	0,0009 (0,35)	0,0011 (0,18)
Squared Screening Intensity		0,0000 (0,04)		0,0000 (-0,04)
Dummy_Environment			-0,0018 (-0,17)	-0,0019 (-0,17)
Dummy_Social			-0,0008 (-0,08)	-0,0009 (-0,09)
Dummy_Governance			(omitted)	(omitted)
Dummy_Products			-0,0015 (-0,11)	-0,0015 (-0,10)
Dummy_Shareholder Engagement			(omitted)	(omitted)
Dummy_Positive Screening			0,0010 (0,09)	0,0011 (0,09)
Dummy_Labels			-0,0003 (-0,02)	-0,0002 (-0,01)
Log Age	0,0042 (0,64)	0,0042 (0,62)	0,0042 (0,63)	0,0043 (0,63)
Log Size	0,0007 (0,35)	0,0006 (0,34)	0,0006 (0,33)	0,0006 (0,33)
Total Expense Ratio	0,0004 (0,13)	0,0005 (0,13)	0,0005 (0,13)	0,0004 (0,12)
Dummy_Global	-0,0009 (-0,13)	-0,0009 (-0,13)	-0,0008 (-0,11)	-0,0008 (-0,10)
Fixed Effects	Included			
Random Effects	Included			
Number of observations	4725			
Number of mutual funds	54			
R-squared within	0,3361	0,3361	0,3361	0,3361
R-squared between	0,9814	0,9814	0,9816	0,9816
R-squared overall	0,3626	0,3626	0,3626	0,3626

Table 13 - Regression results for German funds

This table reports the results from regressions of financial performance on a number of social and control variables. The dependent variable is the risk-adjusted performance (RAP) associated with SRI funds. Explanatory variables include *Screening Intensity*, defined as the number of screens used, and its square (*Squared Screening Intensity)*, and the following dummy variables: *Environment, Social, Governance, Products, Shareholder Engagement*, which take a value of 1 if the fund focuses on environmental, social, governance, products, shareholder engagement, respectively, and 0 otherwise; *Positive Screening* is a dummy variable equal to 1 if the fund employs a positive screening strategy, and 0 otherwise; *Labels* is a dummy variable equal to 1 if the fund has received at least one SRI label, and 0 otherwise. Control variables include: *Size*, measured by Log fund's total net assets (in millions of US dollars); *Age*, measured as the Log of the number of months since the fund's inception; *Total Expense Ratio* is a measure of the total costs associated with managing and operating an investment fund; *Global* is a dummy variable that takes the value of 1 if the fund invests internationally, and 0 otherwise. The subsample includes 18 SRI equity mutual funds for the period 2003-2014. t-statistics are shown in parentheses.
** p-value < 0,10; ** p-value < 0,05; *** p-value < 0,01*

	Germany			
	Model (2)	**Model (3)**	**Model (4)**	**Model (5)**
Constant	-0,0150 (-0,53)	-0,0214 (-0,72)	0,0037 (0,07)	0,0423 (0,42)
Screening Intensity	0,0005 (0,57)	-0,0013 (-0,45)	0,0007 (0,34)	-0,0018 (-0,31)
Squared Screening Intensity		0,0002 (0,66)		0,0004 (0,46)
Dummy_Environment			-0,0004 (-0,02)	-0,0254 (-0,43)
Dummy_Social			-0,0054 (-0,67)	-0,0067 (-0,78)
Dummy_Governance			(omitted)	(omitted)
Dummy_Products			0,0129 (0,69)	-0,0138 (-0,23)
Dummy_Shareholder Engagement			(omitted)	(omitted)
Dummy_Positive Screening			0,0001 (0,00)	-0,0002 (-0,02)
Dummy_Labels			-0,0081 (-1,33)	-0,0078 (-1,27)
Log Age	0,0036 (0,67)	0,0058 (0,92)	-0,0036 (-0,39)	-0,0015 (-0,14)
Log Size	0,0011 (0,68)	0,0014 (0,82)	0,0036 (1,50)	0,0039 (1,57)
Total Expense Ratio	-0,0006 (-0,13)	-0,0007 (-0,17)	0,0012 (0,23)	0,0035 (0,49)
Dummy_Global	-0,0013 (-0,20)	-0,0036 (-0,49)	0,0027 (0,16)	-0,0227 (-0,40)
Fixed Effects	Included			
Random Effects	Included			
Number of observations	1702			
Number of mutual funds	18			
R-squared within	0,6950	0,6951	0,6956	0,6957
R-squared between	0,9956	0,9956	0,9953	0,9950
R-squared overall	0,7253	0,7254	0,7258	0,7258

Table 14 - Regression results for Luxembourg funds

This table reports the results from regressions of financial performance on a number of social and control variables. The dependent variable is the risk-adjusted performance (RAP) associated with SRI funds. Explanatory variables include *Screening Intensity*, defined as the number of screens used, and its square (*Squared Screening Intensity)*, and the following dummy variables: *Environment, Social, Governance, Products, Shareholder Engagement*, which take a value of 1 if the fund focuses on environmental, social, governance, products, shareholder engagement, respectively, and 0 otherwise; *Positive Screening* is a dummy variable equal to 1 if the fund employs a positive screening strategy, and 0 otherwise; *Labels* is a dummy variable equal to 1 if the fund has received at least one SRI label, and 0 otherwise. Control variables include: *Size*, measured by Log fund's total net assets (in millions of US dollars); *Age*, measured as the Log of the number of months since the fund's inception; *Total Expense Ratio* is a measure of the total costs associated with managing and operating an investment fund; *Global* is a dummy variable that takes the value of 1 if the fund invests internationally, and 0 otherwise. The subsample includes 18 SRI equity mutual funds for the period 2003-2014. The t-statistics are shown in parentheses.
** p-value < 0,10; ** p-value < 0,05; *** p-value < 0,01*

	Luxembourg			
	Model (2)	**Model (3)**	**Model (4)**	**Model (5)**
Constant	0,0005 (0,02)	0,0260 (0,82)	0,0087 (0,23)	0,0374 (0,67)
Screening Intensity	-0,0001 (-0,12)	-0,0081 (-1,18)	0,0003 (0,19)	-0,0071 (-0,66)
Squared Screening Intensity		0,0005 (1,17)		0,0005 (0,70)
Dummy_Environment			-0,0040 (-0,39)	-0,0032 (-0,31)
Dummy_Social			-0,0145 (-0,89)	-0,0049 (-0,23)
Dummy_Governance			(omitted)	(omitted)
Dummy_Products			(omitted)	(omitted)
Dummy_Shareholder Engagement			(omitted)	(omitted)
Dummy_Positive Screening			0,0020 (0,27)	-0,0010 (-0,12)
Dummy_Labels			-0,0025 (-0,51)	-0,0029 (-0,58)
Log Age	-0,0005 (-0,11)	0,0003 (0,06)	0,0005 (0,08)	-0,0011 (-0,17)
Log Size	0,0015 (0,79)	0,0017 (0,92)	0,0015 (0,77)	0,0019 (0,92)
Total Expense Ratio	0,0026 (0,58)	0,0020 (0,44)	0,0039 (0,73)	0,0026 (0,46)
Dummy_Global	-0,0034 (-0,68)	-0,0043 (-0,85)	-0,0051 (-0,74)	-0,0066 (-0,91)
Fixed Effects	Included			
Random Effects	Included			
Number of observations	1733			
Number of mutual funds	18			
R-squared within	0,6774	0,6775	0,6774	0,6775
R-squared between	0,9888	0,9922	0,9917	0,9919
R-squared overall	0,7136	0,7138	0,7138	0,7139

Table 15 - Regression results for Swiss funds

This table reports the results from regressions of financial performance on a number of social and control variables. The dependent variable is the risk-adjusted performance (RAP) associated with SRI funds. Explanatory variables include *Screening Intensity*, defined as the number of screens used, and its square (*Squared Screening Intensity)*, and the following dummy variables: *Environment, Social, Governance, Products, Shareholder Engagement*, which take a value of 1 if the fund focuses on environmental, social, governance, products, shareholder engagement, respectively, and 0 otherwise; *Positive Screening* is a dummy variable equal to 1 if the fund employs a positive screening strategy, and 0 otherwise; *Labels* is a dummy variable equal to 1 if the fund has received at least one SRI label, and 0 otherwise. Control variables include: *Size*, measured by Log fund's total net assets (in millions of US dollars); *Age*, measured as the Log of the number of months since the fund's inception; *Total Expense Ratio* is a measure of the total costs associated with managing and operating an investment fund; *Global* is a dummy variable that takes the value of 1 if the fund invests internationally, and 0 otherwise. The subsample includes 64 SRI equity mutual funds for the period 2003-2014. The t-statistics are shown in parentheses.

** p-value < 0,10; ** p-value < 0,05; *** p-value < 0,01*

	Switzerland			
	Model (2)	**Model (3)**	**Model (4)**	**Model (5)**
Constant	0,0441*** (2,63)	0,0418** (2,46)	0,0445** (2,45)	0,0430** (2,35)
Screening Intensity	0,0001 (0,13)	0,0024 (0,90)	0,0003 (0,23)	0,0023 (0,82)
Squared Screening Intensity		-0,0003 (-0,90)		-0,0003 (-0,80)
Dummy_Environment			-0,0025 (-0,69)	-0,0019 (-0,52)
Dummy_Social			-0,0003 (-0,07)	-0,0001 (-0,01)
Dummy_Governance			-0,0042 (-0,72)	-0,0043 (-0,75)
Dummy_Products			-0,0019 (-0,57)	-0,0017 (-0,49)
Dummy_Shareholder Engagement			(omitted)	(omitted)
Dummy_Positive Screening			(omitted)	(omitted)
Dummy_Labels			0,0005 (0,12)	0,0002 (0,06)
Log Age	-0,0072** (-2,03)	-0,0074** (-2,10)	-0,0072** (-1,97)	-0,0075** (-2,05)
Log Size	0,0008 (1,00)	0,0008 (0,98)	0,0010 (1,14)	0,0010 (1,14)
Total Expense Ratio	-0,0015 (-0,72)	-0,0014 (-0,69)	-0,0011 (-0,46)	-0,0012 (-0,51)
Dummy_Global	-0,0045 (-1,49)	-0,0043 (-1,42)	-0,0040 (-1,17)	-0,0039 (-1,16)
Fixed Effects	Included			
Random Effects	Included			
Number of observations	5463			
Number of mutual funds	64			
R-squared within	0,6389	0,6389	0,6389	0,6389
R-squared between	0,9797	0,9802	0,9801	0,9804
R-squared overall	0,6840	0,6840	0,6841	0,6841

Table 16 - Regression results for Scandinavian funds

This table reports the results from regressions of financial performance on a number of social and control variables. The dependent variable is the risk-adjusted performance (RAP) associated with SRI funds. Explanatory variables include *Screening Intensity*, defined as the number of screens used, and its square (*Squared Screening Intensity)*, and the following dummy variables: *Environment, Social, Governance, Products, Shareholder Engagement*, which take a value of 1 if the fund focuses on environmental, social, governance, products, shareholder engagement, respectively, and 0 otherwise; *Positive Screening* is a dummy variable equal to 1 if the fund employs a positive screening strategy, and 0 otherwise; *Labels* is a dummy variable equal to 1 if the fund has received at least one SRI label, and 0 otherwise. Control variables include: *Size*, measured by Log fund's total net assets (in millions of US dollars); *Age*, measured as the Log of the number of months since the fund's inception; *Total Expense Ratio* is a measure of the total costs associated with managing and operating an investment fund; *Global* is a dummy variable that takes the value of 1 if the fund invests internationally, and 0 otherwise. The subsample includes 21 SRI equity mutual funds for the period 2003-2014. The t-statistics are shown in parentheses.
** p-value < 0,10; ** p-value < 0,05; *** p-value < 0,01*

	Scandinavia			
	Model (2)	**Model (3)**	**Model (4)**	**Model (5)**
Constant	-0,0042 (-0,13)	0,0185 (0,52)	-0,0080 (-0,21)	0,0324 (0,76)
Screening Intensity	-0,0007 (-0,48)	-0,0110* (-1,84)	-0,0039 (-0,57)	-0,0136* (-1,65)
Squared Screening Intensity		0,0009* (1,78)		0,0012** (2,06)
Dummy_Environment			0,0192 (0,53)	-0,0030 (-0,08)
Dummy_Social			0,0133 (0,71)	0,0058 (0,30)
Dummy_Governance			(omitted)	(omitted)
Dummy_Products			0,0136 (0,46)	-0,0046 (-0,15)
Dummy_Shareholder Engagement			(omitted)	(omitted)
Dummy_Positive Screening			-0,0134 (-0,67)	-0,0075 (-0,37)
Dummy_Labels			0,0015 (0,25)	-0,0025 (-0,39)
Log Age	0,0017 (0,25)	-0,0004 (-0,06)	0,0014 (0,19)	-0,0012 (-0,16)
Log Size	0,0011 (0,77)	0,0026 (1,61)	0,0013 (0,58)	0,0026 (1,14)
Total Expense Ratio	-0,0010 (-0,27)	0,0017 (0,42)	0,0000 (0,01)	0,0036 (0,78)
Dummy_Global	-0,0021 (-0,44)	-0,0020 (-0,44)	-0,0024 (-0,49)	-0,0016 (-0,33)
Fixed Effects	Included			
Random Effects	Included			
Number of observations	1281			
Number of mutual funds	21			
R-squared within	0,6199	0,6202	0,6200	0,6203
R-squared between	0,9842	0,9885	0,9852	0,9940
R-squared overall	0,6836	0,6844	0,6839	0,6850

Figure 1 - Percentage of funds per country

This figure illustrates the division of the funds by the 13 countries considered in the sample.

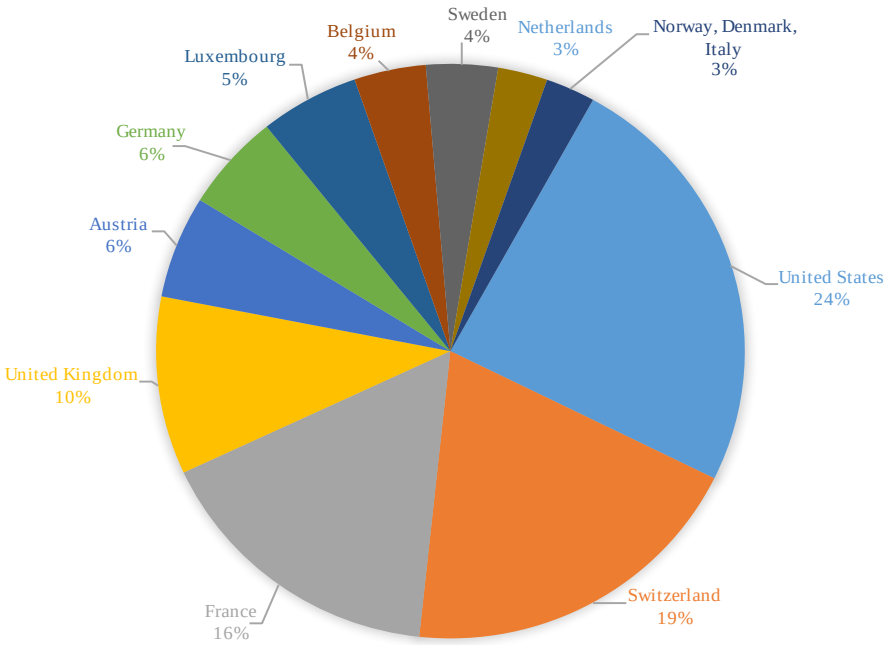

Figure 2 - Average monthly returns

This table presents monthly returns averaged for the period 2000-2014 considering the global sample and two sub-samples (US funds and European funds).

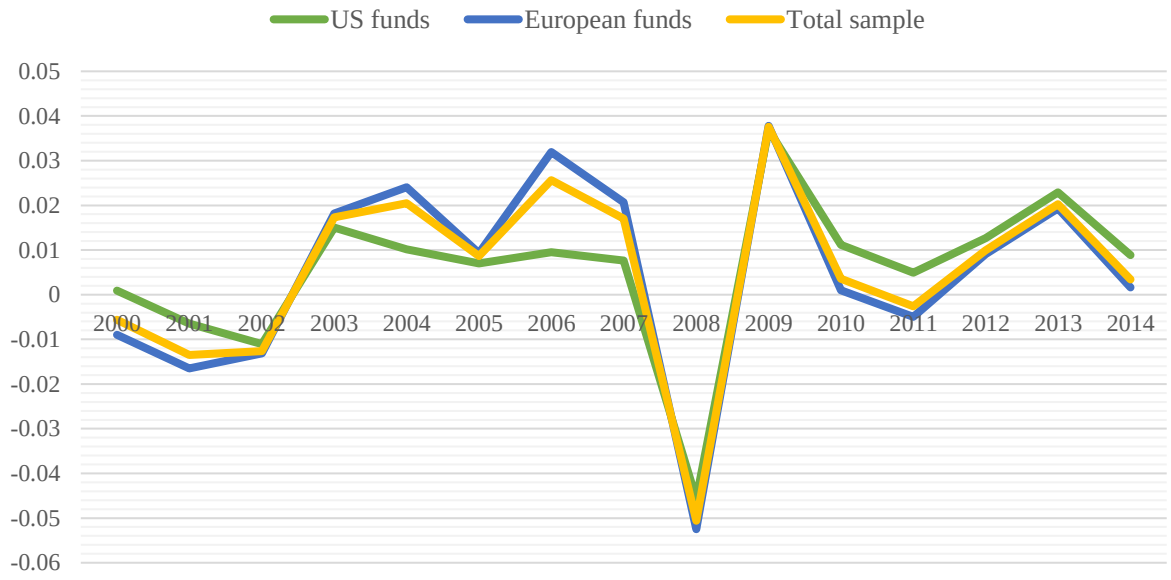

Figure 3 - Screening intensity of SRI funds

This figure presents the number of screens applied by the funds included in the sample.

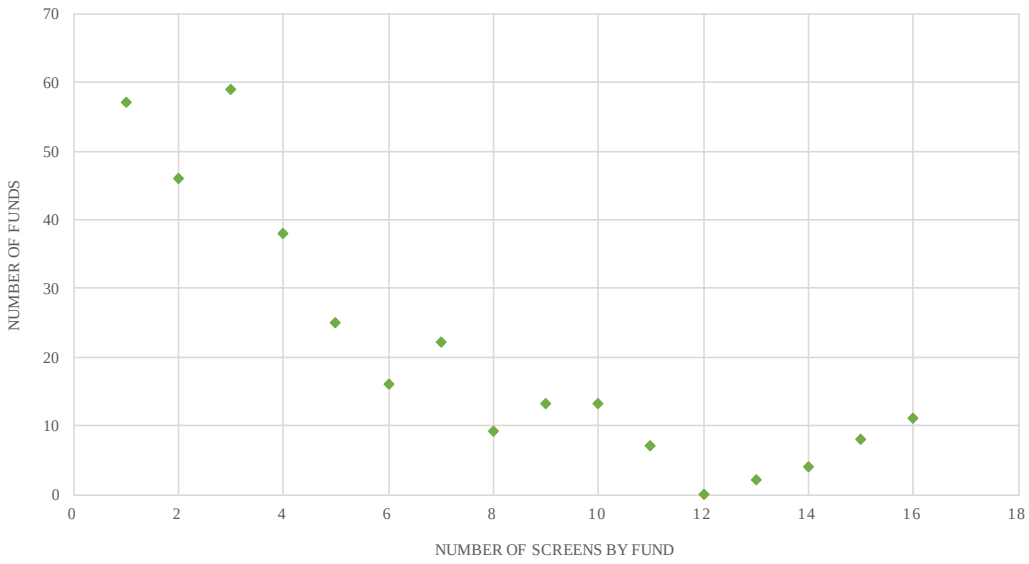

Figure 4 - Average monthly risk-adjusted performance.

This figure shows the evolution of the financial variable of the study – RAP – for all the funds over the sample period (2003-2014).

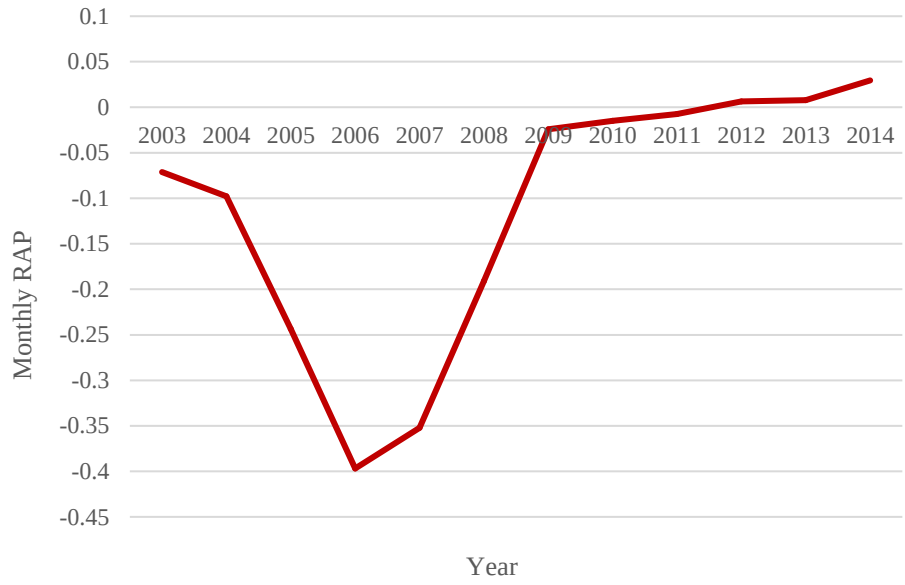

Figure 5 - Average screening intensity.

This figure shows the evolution of a social variable of the study – the screening intensity – for all the funds over the sample period (2003-2014).