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Socially Responsible Investment Funds—An Analysis Applied to Funds Domiciled in the Portuguese and Spanish Markets

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Abstract: Socially Responsible Investments, also referred to as ethical or sustainable investments, have experienced rapid global growth in recent years. They represent an investment approach that incorporates social, environmental, and ethical considerations into decision-making processes. Consequently, the significance of SRIs has captured the attention of academics, prompting inquiries into the impact of integrating social criteria on portfolio performance. The primary objective of this work was to conduct a comparative study of the performance between socially responsible and non-socially responsible investment funds, using funds domiciled in Portugal and Spain. Various multi-factor models, including the three-factor model of Fama and French (1992), the four-factor model of Carhart (1997), and the five-factor model of Fama and French (2015), were employed to assess performance. The sample comprised 125 investment funds, with 43 identified as socially responsible and 82 as non-socially responsible. The study's findings indicate that there are no significant differences between socially responsible funds and their conventional counterparts. The majority of funds experience performance alterations during periods of crisis compared to crisis-free periods. Additionally, when comparing non-conditional models with conditional models, an improvement in the explanatory power of the latter is observed. This suggests that the inclusion of the dummy variable enhances the quality of fit for the models.

Keywords: socially responsible investment funds; conventional funds; profitability; multifactorial models; risk

1. Introduction

Socially Responsible Investment (SRI) funds go beyond financial considerations, also accounting for environmental, social, and corporate governance (ESG) impacts. The incorporation of these criteria into the financial sector has gained global recognition, capturing the interest of socially and environmentally conscious investors. As the importance of SRI funds has grown, academics have raised relevant questions regarding the impact of considering social criteria on portfolio performance (Leite et al., 2018). Neoclassical financial economics suggests that investment decisions should rely solely on expected return and risk. However, the rise of socially responsible investing has compelled contemporary financial theory to acknowledge the role of "psychological profitability" in investment decisions (Cummings, 2000). Ethical investors derive psychological benefits from selecting investments based on ethical and financial criteria, as well as from proxy voting strategies, supporting shareholder proposals promoting environmental and social actions by companies. Empirical analysis of SRI funds dates back to 1972, with studies questioning whether SRI funds can match the performance of non-restricted investment funds. Many studies reveal that, on average, SRI funds do not underperform traditionally managed funds—a noteworthy result given that SRI funds operate within a subset of the complete investment universe (Schröder, 2004). The primary goal of this study is to benchmark the performance of socially responsible and non-socially responsible investment funds domiciled in Portugal and Spain. The objective is to analyze the impact of socially

responsible criteria on fund performance and conduct a comparative analysis between SRI and non-SRI funds to determine efficiency. This analysis aims to illustrate the influence of socially responsible criteria on investment fund performance, answering the question: Are Portuguese and Spanish socially responsible funds a viable option for investors?

Conditional and unconditional multi-factor models, including the three-factor model by Fama and French (1992), the four-factor model by Carhart (1997), and the five-factor model by Fama and French (2015), will be employed to assess fund performance. The sample includes 86 investment funds, with 32 considered socially responsible and 54 considered non-socially responsible. Additionally, funds are categorized by geographical area of investment—38 primarily investing in Europe and 48 investing globally.

The paper unfolds in five sections, beginning with an introduction to the subject, objectives, research methodology, and text structure. The second section reviews the literature on socially responsible investments and compares them with non-socially responsible investments. The third section details the methodology and data used to assess fund performance. The fourth section presents and analyzes the results, providing descriptive statistics and empirical findings. The final section offers conclusions, reflections on study limitations, and suggestions for future research related to the topic.

2. Literature Review

Socially responsible investments, also referred to as ethical or sustainable investments, have experienced significant global growth in recent years. Socially responsible investing involves an investment approach that incorporates social, environmental, and ethical considerations into the decision-making process. In contrast to conventional funds (CFs), these investments selectively include or exclude assets based on environmental, social, corporate governance, or ethical criteria (Renneboog et al., 2008).

2.1. Studies on the performance of socially responsible funds

Existing studies have primarily tested three alternative hypotheses concerning socially responsible investments (SRI). The first hypothesis posits that the risk-adjusted returns of SRI portfolios are lower than those of conventional portfolios. The theoretical foundation for this hypothesis relies on Jensen's alpha, where a portfolio's performance is gauged by its alpha, representing the abnormal return above or below its expected return. The expected return is determined by an asset pricing model, typically the simple Capital Asset Pricing Model (CAPM). Positive alpha indicates excess returns above expectations, while negative alpha denotes excess returns below expectations. The portfolio's systematic risk is denoted by its beta, reflecting its sensitivity to the excess return of the market portfolio. The second alternative hypothesis suggests that the risk-adjusted returns of SRI portfolios are higher than those of conventional portfolios. Several theories support the intuitive validity of this hypothesis, such as the long-term outperformance of ethical companies and the potential positive impact of ethical considerations (the "public relations" effect, etc.). The third hypothesis posits that the risk-adjusted returns of portfolios of socially responsible companies are not statistically different from those of conventional portfolios, representing the null hypothesis. Theoretical explanations for such results vary, including considerations that companies' actions to increase corporate social responsibility may have no significant associated costs or benefits, that the company's investment in Environmental, Social, and Governance (ESG) activities carries costs offset by associated benefits, or that the socially responsible choice may not significantly affect portfolio performance, among others. Luther et al. (1992) conducted the first assessment of the financial performance of SRI funds based on Jensen's alpha and the Sharpe ratio of UK SRI funds, identifying weak evidence that they outperformed market proxies. Subsequent studies, such as those by Hamilton et al. (1993), Luther and Matatko (1994), Mallin et al. (1995), Gregory et al. (1997), and Goldreyer and Diltz (1999), consistently concluded that early SRI funds did not significantly underperform their conventional counterparts in a statistical sense.

Recent studies investigating the performance of Socially Responsible Investment (SRI) funds have employed more sophisticated performance metrics, yielding less consistent results. Statman (2000) analyzed the performance of US SRI funds, revealing differences in average monthly alphas between SRI and conventional funds that, however, were not statistically significant. Bauer et al. (2005) examined the performance of SRI funds in the UK, Germany, and the US using Carhart's (1997) multifactor model, finding no substantial differences in risk-adjusted returns between SRI and conventional funds. Schröder, M. (2004) conducted an evaluation of SRI funds in the USA, Germany, and Switzerland, utilizing Jensen's alpha as a performance measure. Adopting a pragmatic definition of SRI, including all funds and indices declaring themselves socially responsible, Schröder observed that funds employed diverse social, ethical, and environmental criteria for selecting holdings. The analysis demonstrated that the majority of German, Swiss, and American SRI funds did not exhibit a clear performance disadvantage compared to conventional funds. Renneboog et al. (2008) conducted a comprehensive analysis of the performance and risk characteristics of SRI funds from the USA, UK, Continental Europe, and Asia-Pacific, juxtaposed with conventional funds from 17 different countries. The authors asserted that if investors derive non-financial utility from SRI investments, they prioritize non-financial considerations over financial performance. They consistently presented evidence suggesting that SRI investors might incur a cost for prioritizing ethical considerations. However, except for a few countries, the risk-adjusted returns of SRI funds did not statistically differ from those of conventional funds. Nofsinger and Varma (2014) scrutinized the performance of US equity Socially Responsible Investment (SRI) funds during both crisis and non-crisis periods spanning 2000 to 2011. While acknowledging that SRI investing might yield negative abnormal returns over time, the authors found that SRI funds exhibit greater resilience during market crises due to the cushioning effect of Socially Responsible Investment (SRI) and Environmental, Social, and Governance (ESG) factors on downside risk. They assert that companies committed to environmental, social, and corporate governance responsibilities experience fewer adverse events in these areas during both market upturns and downturns. Leite and Cortez (2014) delved into the performance and investment styles of internationally focused SRI funds from eight European countries (Austria, Belgium, France, Germany, Italy, the Netherlands, Spain, and the United Kingdom), comparing them with conventional funds. Using a 5-factor conditional model that allows risk and performance to vary over time and extending Carhart's 4-factor model to include a local factor, the authors found that differences in performance between international SRI funds and their portfolios are not statistically significant. This aligns with the consensus in the majority of studies on SRI funds, suggesting that SRI funds may not fully capitalize on the potential benefits of international diversification. Revelli and Viviani (2015) note the lack of a consensus regarding the relationship between Socially Responsible Investment (SRI) and financial performance. In their exploration of this relationship, they tested whether including corporate social responsibility and ethical concerns in portfolio management is more profitable than conventional investment policies. Their results indicated that integrating corporate social responsibility into stock market portfolios is neither a weakness nor a strength compared to conventional investments. In the study conducted by Matallín-Sáez et al. (2019), aiming to analyze the performance and market timing of US socially responsible mutual funds concerning business cycle regime changes and different grouping criteria, a sample of 202 Socially Responsible Mutual Funds was selected for the period between January 2000 and June 2017. The findings revealed that socially responsible funds significantly underperformed during periods of expansion, with no significant differences observed during periods of recession. Leite et al. (2018) explored the performance of Socially Responsible Funds in Sweden, considering various market states between November 2002 and October 2012. They introduced a dummy variable to Fama and French's (1993) three-factor model to evaluate performance across different market states. The results indicated that most funds performed similarly in both crisis and non-crisis periods. Kiymaz, H. (2019) delved into the performance of socially responsible investment (SRI) funds and the factors influencing fund performance. Analyzing 152 SRI funds from January 1995 to May 2015, the study employed various risk-adjusted performance measures, including the Sharpe ratio, Treynor ratio, Information ratio, Sortino ratio, and M2. Additionally, four-factor models, such as the single-factor

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Jensen model, three-factor Fama-French model, four-factor Carhart model, and five-factor Fama-French model, were used to explain the returns of SRI funds. A cross-sectional regression analysis was also applied to investigate the determinants of SRI fund returns. The conclusion drawn was that, on average, SRI funds provide comparable risk-adjusted returns in relation to various benchmark market indices, with similar results observed in the US market analysis. In 2021, Martins A. A. employed the Value-Based DEA methodology to assess three portfolios, namely SRI Funds, Green Investment Funds, and Conventional Funds. The study concluded that both SRI Funds and Green Investment Funds demonstrated higher efficiency compared to Conventional Funds. This efficiency is anticipated to become increasingly significant in the current macroeconomic environment. A study conducted on the Chinese market, comparing Socially Responsible Funds with Traditional Funds, revealed that the former pose lower risks than Traditional Funds. Despite the improved quality of life resulting from the rapid development of the Chinese economy, environmental pollution and various social issues are escalating. Corporate misconduct, including money laundering, false reporting, price fixing, child labor, and other unethical practices, has become prevalent. In China, social responsibility holds great importance, although the moral standards of companies remain unclear. Consequently, the Socially Responsible Investment Fund emerges as the preferred option for companies aiming to contribute to environmental protection and social welfare (Saci et al., 2022). Debates persist about whether Socially Responsible Funds truly adhere to ethical standards or if they are conventional funds masquerading as socially responsible. According to Utz and Wimmer (2014), a financial and ethical analysis of US investment funds up to 2012 revealed that the "Socially Responsible" label provides no guarantee of excluding unethical companies. They further argue that "Socially Responsible" has evolved into more of a marketing slogan than a reliable indicator of ethical choices.

2.2. Hypotheses to be investigated

Based on the literature review, this study formulates two hypotheses. While existing research generally suggests that there are no significant differences in the risk-adjusted performance between socially responsible fund portfolios and conventional fund portfolios, this study reexamines this performance relationship. Therefore, the first hypothesis is stated as follows:

Hypothesis 1: "The risk-adjusted performance of socially responsible fund portfolios is not significantly different from the performance of conventional portfolios."

The performance analysis employs an aggregate approach, grouping all socially responsible (SR) and conventional funds for each geographical area and pairing them into portfolios. Conventional indices relevant to the analysis are also taken into consideration. Two samples of SR funds are utilized: the first comprises SR funds exclusively investing in shares listed on the European stock market, while the second includes funds with the flexibility to invest in shares listed on any global stock market.

Considering that SR portfolios may exhibit distinct performance characteristics during market downturns or upturns, it is pertinent to explore potential variations. Negative cycles might impact the performance of SR and conventional portfolios differentially, and similarly, during upswings, their risk-adjusted performance could differ. Hence, a new hypothesis is introduced:

Hypothesis 2: "The performance of socially responsible funds differs from conventional funds under different macroeconomic conditions."

3. Research Methodology and Data

Conditional and non-conditional multi-factor models will be employed to evaluate fund performance, specifically utilizing the three-factor model by Fama and French (1992), the four-factor model by Carhart (1997), and the five-factor model by Fama and French (2015). There are several models available for appraising the performance of investment funds, broadly categorized into two types: non-conditional and conditional. The non-conditional models encompass the 3-factor model by Fama and French (1993), the 4-factor model by Carhart (1997), and the 5-factor model by Fama and French (2015). As these models assume a constant risk and performance scenario over time, the

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necessity arose to develop a conditional version by introducing a dummy variable to assess risk in different economic states (Gonçalves, 2016).

3.1. Non-Conditional Models

3.1.1. Fama and French 3-factor model (1993)

The Fama and French (1993) 3-factor model serves to elucidate the performance of stocks and investment portfolios, providing an alternative to the CAPM model, which considers only one factor, namely the excess return of the market. The three factors incorporated in the Fama and French (1993) model are outlined as follows:

1. Market Factor (Mkt-RF): This mirrors the excess return of the market, calculated as the stock return minus the risk-free rate, akin to the CAPM model.
2. SMB (Small Minus Big): This factor captures the distinction in returns between stock portfolios of small companies and large companies, reflecting the size factor.
3. HML (High Minus Low): This factor delineates the difference in returns between stock portfolios of high capitalization and low capitalization companies. HML posits that high capitalization companies outperform their low capitalization counterparts (Gonçalves, 2016).

The model is expressed by the following equation:

$$r_{p,t} - r_{f,t} = \alpha_p + \beta_{p1}\left(r_{m,t} - r_{f,t}\right) + \beta_{p2}(SMB_t) + \beta_{p3}(HML_t) + \varepsilon_{p,t} \quad (1)$$

where:

- $r_{p,t}$ represents the return on fund p in period t;
- $r_{f,t}$ represents the return on the risk-free portfolio in period t;
- β_{p1} represents the systematic risk of fund p;
- β_{p2} and β_{p3} represent the coefficients associated with each risk factor;
- $\left(r_{m,t} - r_{f,t}\right)$ represents the portfolio's market risk premium in period t;
- SMB_t (small minus Big) refers to the difference between the returns of a portfolio with small capitalisation stocks and a portfolio with large capitalisation stocks, in period t;
- HML_t (high minus low) refers to the difference between the return on high book-to-market shares and the return on low book-to-market shares, in period t;
- $\varepsilon_{p,t}$ represents the residual return of fund p in period t.

3.1.2. Carhart's 4-factor model (1997)

Carhart's (1997) 4-factor model introduces an additional element to Fama and French's (1993) 3-factor model, namely the momentum risk factor. Carhart incorporated the momentum factor to account for a market anomaly evident in the returns of financial assets, known as price momentum. Momentum denotes the inclination for assets that have recently demonstrated strong performance to persist in their positive trajectory, and conversely, assets with recent poor performance to continue underperforming in the short term. According to Chan, Jegadeesh, and Lakonishok (1996), the momentum anomaly arises from a market inefficiency linked to a delayed response to information. The momentum factor is derived from the weighted average of companies with the highest returns minus the weighted average of companies with the lowest returns, lagged by one month (Carhart, 1997).

The model is delineated by the following equation:

$$r_{p,t} - r_{f,t} = \alpha_p + \beta_{p1}\left(r_{m,t} - r_{f,t}\right) + \beta_{p2}(SMB_t) + \beta_{p3}(HML_t) + \beta_{p4}(MOM_t) + \varepsilon_{p,t} \quad (2)$$

where:

- β_{p1}, β_{p3} and β_{p3}represent the coefficients associated with each risk factor;
- MOM_t (momentum) represents the difference between the returns of the assets with the best and worst past returns in period t;

3.1.3. Fama and French's 5-factor model (2015)

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The Fama and French (2015) model incorporates two additional risk factors into the Fama and French (1993) three-factor model: RMW (robust minus weak) and CMA (conservative minus aggressive). The purpose of introducing these two extra factors was to enhance the model's capacity to elucidate asset returns by considering supplementary characteristics of companies that were not addressed by the original three factors.

The model is defined by the following equation:

$$r_{p,t} - r_{f,t} = \alpha_p + \beta_{p1}(r_{m,t} - r_{f,t}) + \beta_{p2}(SMB_t) + \beta_{p3}(HML_t) + \beta_{p4}(RMW_t) + \beta_{p5}(CMA_t) + + \varepsilon_{p,t} \quad (3)$$

where:

- β_{p1}, β_{p3} and β_{p3} represent the coefficients associated with each risk factor;
- RMW_t (robust minus weak) represents the difference between the returns of a portfolio of shares of companies with robust results and a portfolio of shares of companies with weak results, in period t;
- CMA_t (conservative minus aggressive) represents the difference between the returns on a portfolio of shares in low-investment companies and a portfolio of shares in high-investment companies, in period t.

3.2. Conditional Models

To evaluate performance in various market conditions, we introduced a dummy variable to the three models outlined earlier. This variable assumes a value of 1 during recessionary periods and 0 during expansionary periods.

3.2.1. Fama and French 3-factor conditional model (1993)

The Fama and French 3-factor conditional model is defined by the equation:

$$r_{p,t} - r_{f,t} = \alpha_p + \alpha_{rec,p}D_t + \beta_{p1}(r_{m,t} - r_{f,t}) + \beta_{rec,p1}(r_{m,t} - r_{f,t})D_t + \beta_{p2}(SMB_t) + +\beta_{rec,p2}(SMB_t)D_t + \beta_{p3}(HML_t) + \beta_{rec,p3}(HML_t)D_t + \varepsilon_{p,t} \quad (4)$$

where:

- SMB_t e HML_t represent the size and value factors, respectively, in period t;
- D_t represents the dummy variable which for periods of recession takes the value 1 and in periods of expansion takes the value 0, in period t;

3.2.2. Carhart's 4-factor Conditional Model (1997)

Carhart's 4-factor conditional model is defined by the equation:

$$r_{p,t} - r_{f,t} = \alpha_p + \alpha_{rec,p}D_t + \beta_{p1}(r_{m,t} - r_{f,t}) + \beta_{rec,p1}(r_{m,t} - r_{f,t})D_t + \beta_{p2}(SMB_t) + + \beta_{rec,p2}(SMB_t)D_t + \beta_{p3}(HML_t) + \beta_{rec,p3}(HML_t)D_t + \beta_{p4}(MOM_t) + \beta_{rec,p4}(MOM_t)D_t + \varepsilon_{p,t} \quad (5)$$

where:

- SMB_t, HML_t and MOM_trepresent the size, value and momentum factors respectively, in period t.

3.2.3. 5-factor conditional model Fama and French (2015)

Fama and French's 5-factor conditional model is characterized by the equation:

$$r_{p,t} - r_{f,t} = \alpha_p + \alpha_{rec,p}D_t + \beta_{p1}(r_{m,t} - r_{f,t}) + \beta_{rec,p1}(r_{m,t} - r_{f,t})D_t + \beta_{p2}(SMB_t) + \beta_{rec,p2}(SMB_t)D_t + \beta_{p3}(HML_t) + \beta_{rec,p3}(HML_t)D_t + \beta_{p4}(RMW_t) + \beta_{rec,p4}(RMW_t)D_t + \beta_{p5}(CMA_t) + \beta_{rec,p5}(CMA_t)D_t + \varepsilon_{p,t} \quad (6)$$

where:

- SMB_t, HML_t, RMW_t and CMA_t represent the size, value, robustness and investment factors, respectively, in period t.

 doi:10.20944/preprints202311.1598.v1

3.3. Data

The sample comprises 125 investment funds, with 43 categorized as socially responsible and 82 as non-socially responsible, resulting in an unbalanced sample. They are further categorized based on the geographical area of investment, with 54 funds primarily investing in Europe and the remaining 71 globally. All selected funds are domiciled in Portugal and Spain, and they belong to the equity fund category, primarily investing in shares, whether listed or unlisted, and units issued by equity funds. The dataset consists of monthly data covering uneven time intervals from July 2013 to June 2023. Monthly prices of investment funds were sourced from the Investing website. Factors such as SMB, HML, RMW, CMA, MOM, and the market excess return were obtained from Professor Kenneth French's website. Additionally, the risk-free rate was derived from the one-month treasury bill rate.

Monthly returns on investment funds were computed using the following formula:

$$R_{p,t} = \frac{C_{p,t} - C_{p,t-1}}{C_{p,t-1}} (7)$$

where:

- $R_{p,t}$ is the return on fund p in period t;
- $C_{p,t}$ is the price of fund p in period t;
- $C_{p,t-1}$ is the price of fund p in period t-1;

3.3.1. Socially Responsible Funds Distinction

To distinguish between SRI Funds and others, Morningstar's sustainability rating served as the selection criterion. This rating categorizes funds on a scale from 1 (worst) to 5 (best) in comparison to their category peers. In 2016, Morningstar introduced the Morningstar Sustainability Rating and Score, which assesses funds based on ESG factors relative to their peers in the Morningstar category. This product has the advantage of enabling the identification of sustainable funds, even if they don't explicitly designate themselves as supporting an SRI approach. The use of these scores represents a significant departure from prior studies, which typically compare SRI funds with an index or employ advanced matching approaches. The latter involves comparing the performance of SRI and non-SRI investment funds with similar characteristics (such as fund size, age, expenses, etc.), with due consideration given to management and transaction costs for both SRI and conventional funds (Durán-Santomil et al., 2019). In this study, socially responsible investment funds are defined as those with a Morningstar rating of 4 and 5, while funds with a rating of 1 to 3 are considered non-socially responsible.

3.3.2. Groups of funds

The funds are categorized based on their geographical investment focus into two groups: those investing in Europe and those with a global investment scope. Each group has two subcategories: SR (socially responsible) funds and non-SR funds. Specifically, the Europe SR fund group corresponds to the Europe non-SR fund group, and similarly, the Global SR fund group corresponds to the Global non-SR fund group. The non-SR funds predominate in both categories, resulting in the formation of four unbalanced groups of funds.

Table 1 provides summary statistics for the monthly excess returns of the four fund groups, categorized into socially responsible (SR) and non-socially responsible (non-SR), with investments in both Europe and worldwide. The two SR groups and two non-SR groups are analyzed, covering the period from July 2013 to June 2023. The presented statistics include average excess returns, standard deviation, minimum and maximum values, and the p-value from the Jarque-Bera test. All four groups exhibit positive average excess returns. The Europe non-SR group demonstrates the highest volatility, while the Global SR group exhibits the lowest. The results of the Jarque-Bera test indicate the rejection of the null hypothesis that excess returns follow a normal distribution for all portfolios.

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Table 1. - Descriptive statistics of the fund groups.

	No. of funds	No. of observations	Mean (%)	Standard deviation (%)	Min. (%)	Max. (%)	Jarque-Bera	p-value
Europe SR	18	1926	0.3275	4.1794	-33.7423	51.720	25874.0	0.0000
Europe non-SR	36	3789	0.3407	4.6186	-32.5170	40.227	8694.1	0.0000
Global SR	25	2624	0.2091	2.7459	-15.4530	16.056	2812.1	0.0000
Global non-SR	46	4758	0.36	3.6150	-24.7170	27.165	5943.0	0.0000

3.3.3. Recession periods

To evaluate fund performance under different market conditions, we initiated the identification of recession periods using data provided by the Federal Reserve Bank of St. Louis, commonly referred to as the St. Louis Fed—one of the regional agencies within the U.S. Federal Reserve System. The St. Louis Fed has delineated a specific recessionary timeframe based on OECD recession indicators for the Eurozone: December 2017 to May 2020, spanning 30 months. Consequently, the dummy variable designating recession and expansion periods for use in conditional models will be set to 1 for the period from December 2017 to May 2020 and 0 for all other periods.

4. Empirical Results

4.1. Performance of groups of funds

The estimates for both non-conditional and conditional 3, 4, and 5 factor models were derived through panel data regression employing both fixed effects and random effects methodologies. In all the estimated models, the null hypothesis of the Haussman test remained unrejected, indicating no evidence of correlation between individual effects and explanatory variables. Consequently, the random effects model was consistently chosen. The R statistical software was utilized to obtain these estimates.

4.1.1. Non-Conditional Models

4.1.1.1. Fama and French 3-factor model (1993)

We initiated our analysis by examining the unconditional three-factor risk model proposed by Fama and French (1993), encompassing the size (SMB) and value (HML) factors. Table 2 illustrates the coefficient estimates derived from the regression:

$$r_{p,t} - r_{f,t} = \alpha_p + \beta_{p1}(r_{m,t} - r_{f,t}) + \beta_{p2}(SMB_t) + \beta_{p3}(HML_t) + \varepsilon_{p,t} \quad (7)$$

The results depict the performance of the funds using the three-factor model, revealing that the risk-adjusted performance of both SR and non-SR funds is not significantly different from conventional funds. For the Global group of funds, both SR and conventional, the alphas are negative, indicating that actively managed funds underperformed their market benchmarks on a risk-adjusted basis. The alphas of the Europe fund group, on the other hand, are positive. However, it's noteworthy that the alphas are not statistically significant, except for Global SR. The market risk variable is statistically significant at the 0.1% level and positive in all groups. The SMB factor is not statistically significant for Europe funds, unlike HML, which is statistically significant for the groups: Europe SR, Europe non-SR, and Global SR. This may suggest that the exposure of fund portfolios to smaller companies is not a crucial factor for returns. On the other hand, their exposure to companies with higher book-to-market (market capitalization) is a determining factor and statistically significant at the 0.1% level for fund returns. However, this argument that high capitalization companies outperform those with low capitalization is not supported when we compare the group of Global non-SR funds, which lacks statistical significance.

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Table 2. - Results obtained for the 3-factor model (1993).

Variable	Europe SR	Europe non-SR	Global SR	Global non-SR
α	0.043 (0.070)	0.019 (0.046)	-0.146. (0.082)	-0.068 (0.048)
β_1	0.584*** (0.015)	0.695*** (0.010)	0.433*** (0.009)	0.608*** (0.008)
β_2	-0.039 (0.042)	-0.023 (0.028)	-0.047. (0.025)	0.073** (0.023)
β_3	0.085*** (0.023)	0.316*** (0.015)	-0.038** (0.013)	0.008 (0.012)
R^2	0.469	0.623	0.485	0.554
R^2 adjusted	0.468	0.622	0.485	0.553
F Statistic	1697.348***	6248.11***	2470.331***	5900.873***
Hausman Test (p-value)	0.9203 (0.8205)	1.0755 (0.783)	2.6285 (0.4525)	4.9206 (0.1777)

The levels of statistical significance of the coefficients are:
'***' p-value <0.1%, '**' p-value <1%, '*' p-value <5%, '.' p-value <10%.

4.1.1.2. Carhart's 4-factor model (1997)

Next, we scrutinized Carhart's (1997) non-conditional 4-factor model, which introduces another factor to Fama and French's (1993) 3-factor model—the momentum risk factor (MOM). Table 3 presents the coefficient estimates derived from the regression:

$$r_{p,t} - r_{f,t} = \alpha_p + \beta_{p1}(r_{m,t} - r_{f,t}) + \beta_{p2}(SMB_t) + \beta_{p3}(HML_t) + \beta_{p4}(MOM_t) + \varepsilon_{p,t} (8)$$

The outcomes reveal that the inclusion of the momentum factor brings about distinctions in the estimated parameters of the SR fund samples and the conventional funds. In Table 3, the only statistically significant alphas are those of the Europe non-SR funds at the 5% level and the Global SR funds at the 10% level. Hence, the Europe SR and Global non-SR fund groups lack statistical significance, indicating that their performance did not significantly differ from their market benchmarks. Market risk holds statistical significance for all funds at a 0.1% significance level. Regarding the SMB risk factor, it remains statistically insignificant for the Europe fund groups. There is a notable exposure to the HML and MOM risk factors for non-SR Europe funds, with statistical significance at 1%. Conversely, the Global non-SR funds do not exhibit statistical significance for the HML and MOM factors. Consequently, there is some evidence of statistically significant distinctions between the performance of the Global SR fund group and the corresponding group of conventional funds concerning the HML and MOM factors. Compared to the three-factor model, the incorporation of the momentum risk factor in this model enhances explanatory power.

Table 3. - Results obtained for the 4-factor model (1997).

Variable	Europe SR	Europe non-SR	Global SR	Global non-SR
α	0.095 (0.073)	0.106* (0.048)	-0.143. (0.082)	-0.067 (0.048)
β_1	0.563*** (0.017)	0.659*** (0.011)	0.431*** (0.010)	0.607*** (0.009)

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β_2	-0.023 (0.042)	0.003 (0.028)	-0.047. (0.025)	0.073** (0.023)
β_3	0.054* (0.026)	0.264*** (0.017)	-0.040** (0.014)	0.007 (0.013)
β_4	-0.07* (0.029)	-0.118*** (0.019)	-0.006 (0.016)	-0.002 (0.015)
R^2	0.471	0.627	0.485	0.554
R^2 adjusted	0.469	0.626	0.484	0.553
F Statistic	1707.645***	6347.89***	2469.774***	5899.664***
Hausman Test (p-value)	0.97127 (0.9141)	1.1548 (0.8855)	2.6238 (0.6226)	4.9312 (0.2944)

The levels of statistical significance of the coefficients are: '***' p-value <0.1%, '**' p-value <1%, '*' p-value <5%, '.' p-value <10%.

4.1.1.3. Fama and French's 5-factor model (2015)

Ultimately, the Fama and French (2015) model was scrutinized, introducing two additional risk factors to the Fama and French (1997) three-factor model: RMW (robust minus weak) and CMA (conservative minus aggressive). Table 4 illustrates the coefficient estimates derived from the regression:

$$r_{p,t} - r_{f,t} = \alpha_p + \beta_{p1}(r_{m,t} - r_{f,t}) + \beta_{p2}(SMB_t) + \beta_{p3}(HML_t) + \beta_{p4}(RMW_t) + \ +\beta_{p5}(CMA_t) + \varepsilon_{p,t} \quad (9)$$

Table 4 indicates that the alphas lack statistical significance across all four fund groups. Market risk demonstrates statistical significance for all funds at a level of 0.1%. The SMB risk factor lacks statistical significance for Europe SR, Europe non-SR, and Global non-SR funds. Conversely, the HML and CMA risk factors exhibit statistical significance at a 1% level for the Global SR and Global non-SR funds.

Table 4. - Results obtained for the 5-factor model (2015).

Variable	Europe SR	Europe non-SR	Global SR	Global non-SR
α	-0.002 (0.072)	-0.015 (0.048)	-0.124 (0.085)	-0.032 (0.048)
β_1	0.567*** (0.017)	0.680*** (0.011)	0.405*** (0.010)	0.579*** (0.009)
β_2	-0.049 (0.046)	-0.036 (0.031)	-0.068* (0.027)	0.035 (0.025)
β_3	0.204*** (0.052)	0.414*** (0.035)	0.109*** (0.027)	0.160*** (0.025)
β_4	0.179* (0.073)	0.135** (0.049)	0.067. (0.037)	0.024 (0.034)
β_5	-0.097 (0.082)	-0.097. (0.055)	-0.260*** (0.040)	-0.287*** (0.037)
R^2	0.471	0.624	0.494	0.560
R^2 adjusted	0.470	0.623	0.493	0.559
F Statistic	1709.273***	6273.117***	2552.562***	6046.224***

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Hausman Test	1.56	2.0717	1.4747	3.4894
(p-value)	(0.906)	(0.8391)	(0.916)	(0.625)

The levels of statistical significance of the coefficients are: '***' p-value <0.1%, '**' p-value <1%, '*' p-value <5%, '.' p-value <10%.

4.1.2. Conditional Models

4.1.2.1. Fama and French 3-factor conditional model (1993)

In the conditional models, a dummy variable was introduced to assess performance in distinct market states. Initially, we examined Fama and French's (1993) conditional three-factor risk model, encompassing the size (SMB) and value (HML) factors. Table 5 illustrates the coefficient estimates derived from the regression:

$$r_{p,t} - r_{f,t} = \alpha_p + \alpha_{rec,p} D_t + \beta_{p1}(r_{m,t} - r_{f,t}) + \beta_{rec,p1}(r_{m,t} - r_{f,t}) D_t + \beta_{p2}(SMB_t) + \beta_{rec,p2}(SMB_t) D_t + \beta_{p3}(HML_t) + \beta_{rec,p3}(HML_t) D_t + \varepsilon_{p,t} \quad (10)$$

In Table 5, the alpha is positive, and the rec alpha is negative, except for Global SR, indicating that both SR and conventional funds have outperformed their benchmarks, except during periods of recession when the opposite is observed. However, neither the alpha nor the rec alpha is statistically significant. This implies that fund performance is neutral compared to the market, both in expansion and recession periods. Regarding market risk, the beta is positive and statistically significant at 0.1% during expansion for both portfolios and their conventional counterparts. There is an increase in the portfolios' exposure to this risk during periods of recession for all groups. As for the SMB and HML factors, they are statistically significant at significance levels ranging between 0.1% and 5%. It is observed that during expansion periods, the SMB coefficient is negative, indicating reduced exposure to smaller companies. Conversely, in recession periods, the exposure of fund portfolios to the SMB factor is positive, indicating an increase in exposure to smaller companies. Regarding the HML risk factor, during expansion periods, the coefficient is positive only for funds investing in Europe, suggesting these funds have a high exposure to companies with a higher book-to-market (market capitalization). In contrast, global SR and conventional funds have a negative beta, reflecting low exposure to high capitalization companies. During recession periods, the exposure of funds to the HML risk factor increases for all fund groups, though it is statistically significant only for Global non-SR funds. Comparing the unconditional three-factor model with the conditional model shows an improvement in the latter's explanatory power, indicating that the inclusion of the dummy variable enhances the model's fit quality.

Table 5. - Results obtained for the 3-factor conditional model (1993).

Variable	Europe SR	Europe non-SR	Global SR	Global non-SR
α	0.149.	0.098.	-0.059	0.063
	(0.083)	(0.053)	(0.086)	(0.054)
αrec	-0.134	-0.097	-0.001	-0.016
	(0.167)	(0.116)	(0.099)	(0.089)
β1	0.540***	0.650***	0.376***	0.503***
	(0.017)	(0.011)	(0.011)	(0.010)
β1rec	0.116**	0.157***	0.118***	0.236***
	(0.035)	(0.025)	(0.020)	(0.018)

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β2	-0.178*** (0.049)	-0.138*** (0.032)	-0.127*** (0.029)	-0.055* (0.026)
β2rec	0.367*** (0.096)	0.329*** (0.067)	0.169** (0.062)	0.214*** (0.056)
β3	0.055* (0.026)	0.293*** (0.017)	-0.078*** (0.015)	-0.052*** (0.013)
β3rec	0.046 (0.060)	0.029 (0.042)	0.123*** (0.031)	0.169*** (0.028)
R^2	0.481	0.633	0.501	0.582
R^2 adjusted	0.479	0.633	0.500	0.581
F Statistic	1774.59***	6534.367***	2630.342***	6604.344***
Hausman Test (p-value)	1.1109 (0.9928)	3.1275 (0.873)	2.7333 (0.9085)	2.7197 (0.9097)

The levels of statistical significance of the coefficients are: '***' p-value <0.1%, '**' p-value <1%, '*' p-value <5%, '.' p-value <10%.

4.1.2.2. Carhart's 4-factor Conditional Model (1997)

Table 6 displays the coefficient estimates obtained from the regression for Carhart's (1997) 4-factor conditional model, which introduces the momentum risk factor to Fama and French's (1993) 3-factor model.

$$r_{p,t} - r_{f,t} = \alpha_p + \alpha_{rec,p} D_t + \beta_{p1}(r_{m,t} - r_{f,t}) + \beta_{rec,p1}(r_{m,t} - r_{f,t}) D_t + \beta_{p2}(SMB_t) + \beta_{rec,p2}(SMB_t) D_t + \beta_{p3}(HML_t) + \beta_{rec,p3}(HML_t) D_t + \beta_{p4}(MOM_t) + \beta_{rec,p4}(MOM_t) D_t + \varepsilon_{p,t} \quad (11)$$

Table 6 indicates that the alpha is statistically significant for Europe non-SR and Europe SR funds in expanding markets, but the alpha for recession markets is not statistically significant for the four fund groups. In the first case, this suggests that the funds have outperformed the benchmark market index. It can also be observed that market risk is positive and statistically significant in expanding markets, at a significance level of 0.1%, for all four fund groups. However, the beta coefficients' values indicate that conventional funds exhibit a higher correlation with market risk. It's noteworthy that during periods of recession, there is a significant increase (at a significance level between 0.1% and 1%) in the market risk factor. The SMB risk factor is statistically significant for all fund groups. In other words, SR and conventional funds, both European and global, show substantial exposure to the Fama and French (1993) size factor at a significance level between 0.1% and 5%. During periods of expansion, the SMB coefficient is negative, indicating reduced exposure to smaller companies. In periods of recession, the portfolios' exposure to the SMB factor significantly increases, as indicated by the positive rec beta.

Table 6. - Results obtained for the 4-factor conditional model (1997).

Variable	Europe SR	Europe non-SR	Global SR	Global non-SR
α	0.227** (0.088)	0.206*** (0.056)	-0.034 (0.086)	0.088 (0.055)
α_{rec}	-0.143 (0.172)	-0.090 (0.118)	0.002 (0.101)	-0.023 (0.090)
β_1	0.510*** (0.021)	0.606*** (0.013)	0.363*** (0.013)	0.489*** (0.011)

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β_{1rec}	0.116** (0.039)	0.154*** (0.027)	0.150*** (0.022)	0.262*** (0.020)
β_2	-0.164*** (0.050)	-0.115*** (0.032)	-0.130*** (0.029)	-0.059* (0.026)
β_{2rec}	0.381*** (0.097)	0.349*** (0.067)	0.160* (0.063)	0.210*** (0.056)
β_3	0.013 (0.031)	0.234*** (0.019)	0.092*** (0.016)	-0.067*** (0.015)
β_{3rec}	0.031 (0.066)	-0.005 (0.046)	0.204*** (0.043)	0.227*** (0.038)
β_4	-0.085* (0.033)	-0.124*** (0.021)	-0.038* (0.018)	-0.039* (0.016)
β_{4rec}	-0.051 (0.067)	-0.103* (0.047)	0.135** (0.045)	0.102* (0.040)
R^2	0.484	0.640	0.503	0.582
R^2 adjusted	0.481	0.639	0.501	0.582
F Statistic	1795.748***	6706.452***	2648.27***	6622.81***
Hausman Test (p-value)	1.1031 (0.9992)	3.7359 (0.9279)	2.7015 (0.975)	3.0572 (0.962)

The levels of statistical significance of the coefficients are: '***' p-value <0.1%, '**' p-value <1%, '*' p-value <5%, '.' p-value <10%.

The HML risk factor is statistically significant at a significance level of 0.1% for periods of expansion, except for the Europe SR fund group. For periods of recession, the impact is only statistically significant for the Global fund group. Regarding the MOM factor, the betas are negative during economic booms and statistically significant at 0.1% and 5%. This implies that most of the Fama and French (1993) and Carhart (1997) factors are statistically significant. The negative coefficients of the MOM (momentum) factor have an inverse relationship with the profitability of the groups, and during economic recessions, the effects are opposite depending on whether the funds are invested in European equities (decreases) or global equities (increases). Comparing the unconditional four-factor model with the conditional model reveals an improvement in the latter's explanatory power. This suggests that the inclusion of the dummy variable enhances the model's overall fit.

4.1.2.3. Fama and French 5-factor conditional model (2015)

Finally, the Fama and French (2015) model was analyzed, which adds two more risk factors to the three-factor model of Fama and French (1993): RMW (robust minus weak) and CMA (conservative minus aggressive). Table 7 presents the coefficient estimates obtained from the regression:

$$r_{p,t} - r_{f,t} = \alpha_p + \alpha_{rec,p} D_t + \beta_{p1}(r_{m,t} - r_{f,t}) + \beta_{rec,p1}(r_{m,t} - r_{f,t}) D_t + \beta_{p2}(SMB_t) + \beta_{rec,p2}(SMB_t) D_t + \beta_{p3}(HML_t) + \beta_{rec,p3}(HML_t) D_t + \beta_{p4}(RMW_t) + \beta_{rec,p4}(RMW_t) D_t + \beta_{p5}(CMA_t) + \beta_{rec,p5}(CMA_t) D_t + \varepsilon_{p,t} \quad \textbf{(12)}$$

Table 7 indicates that the alpha is statistically significant for Europe non-SR, Europe SR, and Global non-SR funds in growth markets, but the alpha for recession markets is not statistically significant for the four groups of funds. The positive values reflect superior performance compared to market benchmarks. As for market risk, it is positive and statistically significant in rising markets, at a significance level of 0.1%, for all four groups of funds. For periods of recession, the portfolios of

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the funds underwent significant changes, at a significance level between 0.1% and 1%, in the market beta, consisting of an increase in the portfolios' exposure to market risk for all groups of funds. Regarding the SMB risk factor, it is statistically significant for all groups of funds in periods of expansion. In periods of expansion, the SMB coefficient is negative, indicating reduced exposure to smaller companies. In periods of recession, the effect on portfolio exposure to the SMB factor is positive, significantly increasing the weight of this factor. The HML risk factor is statistically significant at a significance level of 1%, in periods of expansion in the Europe non-SR fund group and in periods of recession only for the Global non-SR fund group. In other words, the effect of the recession on the factor associated with larger capitalization companies is practically neutral. As for the RMW risk factor, there is a significant exposure to this factor, at a significance level of 1% in periods of expansion, for the group of Global non-SR funds, with opposite signs and an exposure at a significance level of 10% in periods of recession. The beta of this risk factor undergoes a significant variation, reinforcing the exposure to the robust minus weak factor, at the 5% and 10% level, but only for conventional funds. For the CMA risk factor, the coefficients are negative and significant for periods of expansion, showing an inverse relationship between profitability and the conservative minus aggressive factor. In periods of recession, with statistical significance, only the performance of the two groups of conventional funds suffers effects of the opposite sign: an increase in the factor in the case of the Europe non-SR funds and a significant decrease in the Global non-SR group.

Table 7. - Results obtained for the 5-factor conditional model (2015).

Variable	Europe SR	Europe non-SR	Global SR	Global non-SR
α	0.181* (0.091)	0.132* (0.057)	0.002 (0.086)	0.173** (0.056)
α_{rec}	-0.193 (0.178)	-0.132 (0.122)	-0.082 (0.104)	-0.149 (0.093)
β_1	0.515*** (0.020)	0.626*** (0.013)	0.352*** (0.012)	0.480*** (0.011)
β_{1rec}	0.129** (0.039)	0.165*** (0.027)	0.118*** (0.022)	0.226*** (0.020)
β_2	-0.241*** (0.057)	-0.204*** (0.036)	-0.193*** (0.034)	-0.186*** (0.031)
β_{2rec}	0.410*** (0.111)	0.403*** (0.076)	0.187** (0.068)	0.276*** (0.060)
β_3	0.142* (0.061)	0.365*** (0.039)	0.015 (0.032)	-0.006 (0.029)
β_{3rec}	0.029 (0.122)	0.011 (0.084)	0.160* (0.067)	0.305*** (0.060)
β_4	-0.012 (0.089)	-0.045 (0.056)	-0.067 (0.043)	-0.216*** (0.039)
β_{4rec}	0.139 (0.209)	0.314* (0.143)	0.077 (0.125)	0.207. (0.112)
β_5	-0.242* (0.096)	-0.240*** (0.062)	-0.209*** (0.044)	-0.190*** (0.039)
β_{5rec}	0.180 (0.220)	0.314* (0.154)	-0.094 (0.109)	-0.245* (0.097)
R^2	0.483	0.635	0.510	0.591

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R^2 adjusted	0.480	0.634	0.508	0.590
F Statistic	1784.718***	6581.997***	2716.157***	6864.103***
Hausman Test (p-value)	1.6911 (0.9993)	6.7098 (0.8221)	2.4589 (0.9961)	2.39 (0.9966)

The levels of statistical significance of the coefficients are: '***' p-value <0.1%, '**' p-value <1%, '*' p-value <5%, '.' p-value <10%.

4.1.3. Comparison of the adjusted coefficients of determination

Table 8 presents the adjusted coefficients of determination (R^2) for the four groups of funds in each of the analyzed models. Among the European fund group, the 4-factor conditional model stands out as the one with the highest adjusted coefficient of determination, indicating its superior ability to explain the variation in fund returns based on market variables. For Global funds, the model that excels in explaining return variation is the Conditional 5-factor model. Overall, the adjusted coefficients of determination are consistently higher for the conditional models incorporating the recession dummy variable when compared to the non-conditional models.

Table 8. - Comparison of the adjusted coefficients of determination.

Models	Europe SR	Europe non-SR	Global SR	Global non-SR
Fama and French 3-factor model (1993)	0.468	0.622	0.485	0.553
Carhart's 4-factor model (1997)	0.469	0.626	0.484	0.553
Fama and French's 5-factor model (2015)	0.470	0.623	0.493	0.559
Fama and French 3-factor conditional model (1993)	0.479	0.633	0.500	0.581
Carhart's 4-factor Conditional Model (1997)	0.481	0.639	0.501	0.582
Conditional 5-factor model Fama and French (2015)	0.480	0.634	0.508	0.590

4.2. Results discussion

This study compared the performance of SR funds and conventional funds using both conditional and unconditional models. The analysis focused on four fund portfolios, evaluating their performance through multifactor models. The market factor served as the proxy, measured by corresponding conventional market indices in each geographical investment area. By regressing time series against explanatory variables, the differences between regression coefficients were observed. The results of the non-conditional models are presented in Tables 2, 3, and 4. When comparing SR funds with conventional funds, no statistically significant differences in performance were evident. The alpha lacked statistical significance for SR Europe funds and global non-SR funds in the three- and four-factor models, and for all funds in the five-factor model. Hence, the majority of SR and conventional funds exhibited neutral performance. In instances where statistically significant alphas were observed, they were negative for global SR funds and positive for Europe non-SR funds. Concerning investment style, both SR and conventional portfolios appeared to have limited exposure to small-cap stocks and, conversely, exhibited greater exposure to large-cap companies. Upon examining the adjusted coefficients of determination, it became apparent that explanatory variables explained only a limited portion of the variability in each fund type. While the majority of factors were relevant for both SR and conventional funds, supported by the statistical significance of coefficients, it is reasonable to infer that they do not account for part of the returns. Additionally, the adjusted R2 consistently favored conventional fund portfolios. The results indicate that the risk-adjusted returns of socially responsible fund portfolios are not statistically significantly different from those of conventional fund portfolios.

In the case of conditional models, discernible differences in performance emerged between SR funds and non-SR funds. As indicated in Tables 6, 7, and 8, both SR and non-SR fund portfolios outperformed the market during boom periods, evident in positive and statistically significant alphas. At an aggregate level, SR funds seemed to exhibit comparable performance in crisis and non-crisis periods, mirroring the trend observed for conventional funds, although these outcomes lacked statistical significance. Consequently, SR funds performed similarly across different economic states, and the same was true for conventional funds. Analyzing alpha differences, SR Europe funds appeared to outperform their conventional counterparts in non-crisis periods, while the reverse held true for global fund portfolios. Moreover, during crisis periods, the performance of both fund types tended to be similar. Regarding exposure to risk factors, notable differences were observed across the two market states. The findings affirmed that funds investing in Europe, whether conventional or SR, experienced similar impacts, whereas distinctions were more pronounced for global funds. Comparing non-conditional models with conditional models demonstrated an enhancement in the latter's explanatory power, suggesting that the inclusion of the dummy variable improved the model's fit. Overall, the results deviate from previous studies (Nofsinger & Varma, 2014), which concluded that PE funds not only performed better in crisis periods compared to non-crisis periods but also outperformed conventional funds during crises. Regarding Hypothesis 1, "The risk-adjusted performance of socially responsible fund portfolios is not significantly different from the performance of conventional portfolios," the hypothesis was generally confirmed. Hypothesis 2, "The performance of socially responsible funds differs from that of conventional funds under different macroeconomic conditions," was also generally confirmed.

5. Conclusions

This paper examines the performance of socially responsible (SR) funds offered by Portuguese and Spanish entities in comparison with non-SR funds. The objective is to illustrate the impact of socially responsible criteria on investment fund performance and assess whether Portuguese and Spanish socially responsible funds are a favorable choice for investors. At an aggregate level, the results indicate that SR and conventional fund portfolios perform neutrally, revealing no significant differences between socially responsible funds and their conventional counterparts. This observation suggests that the composition of SR funds may not differ significantly from that of conventional funds. These findings align with the majority of studies in the scientific literature, particularly in terms of manager performance, which tends to be market-neutral (Revelli & Viviani, 2015; Schröder, M., 2004). Aggregate results also imply that SR funds, like conventional funds, exhibit comparable performance in both crisis and non-crisis periods, although statistical significance is lacking. In terms of conventional funds, performance is similarly consistent across different economic states. Examining conditional models reveals that SR and non-SR fund portfolios outperform the market during periods of expansion, as indicated by positive and statistically significant alphas. However, the results concerning performance in different market states suggest that most funds experience altered performance during crisis periods compared to non-crisis periods. Notably, these findings deviate from previous literature, which suggests that SR funds perform better in periods of turbulence. Comparing non-conditional models with conditional models highlights an improvement in the latter's explanatory power, indicating that the inclusion of the dummy variable enhances the model's fit. The findings of this study prompt questions about the criteria and methods employed in selecting socially responsible (SR) funds and emphasize the necessity for credible and independent certification of the social responsibility level of investment funds. However, it is crucial to acknowledge certain limitations in the conducted research. Notably, the absence of some complementary tests, such as t-tests for sample means, for each group of Socially Responsible Investment (SRI) and non-SRI funds limits a comprehensive understanding of the performance differences between these sets of funds. Additionally, using the same market index to evaluate both SRI and non-SRI funds might compromise the accuracy of comparisons. This is because the chosen market index may be more suitable for conventional funds, failing to account for specific factors related to SRI funds. Another constraint arises from the omission of equally weighted portfolios in

the analysis. For future studies, expanding the geographical scope beyond Europe and the global market, such as including the United States, would enhance the ability to compare the performance of socially responsible investments in a significant capital market. Moreover, conducting an individualized analysis, in addition to aggregate assessments, would provide a more detailed understanding.

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