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Expanding on the debate around the performance of SRI Funds

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Expanding on the debate around the performance of SRI Funds
Profundizando en el Debate sobre la Rentabilidad de los Fondos ISR

Memoria presentada por Susana Martinez Meyers para optar al grado de doctor/a por la Universitat Jaume I

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Abstract

OVERVIEW OF ABSTRACTS

The study dwells on main issues related to SRI funds such as the relative performance of SRI funds vs Conventional Funds, the true nature of SRI funds, and the impact of SFDR mandatory regulation as a driver for change in SRI funds ESG scores. In this section, we include a short abstract of the main chapters that summarize the purpose of the research and our main findings.

CHAPTER 2:

This chapter conducts a systematic literature review of primary studies that analyze the relative performance of SRI Equity investment funds vs their conventional counterparts. The existing literature is analyzed and categorized into two samples depending on the benchmark used. Based on our research of the period between 1992 to July 2021 we arrive at a total sample of 54 papers. The study concludes that the vast majority (67%) of the empirical studies show no difference or a not statistically significant difference in the relative financial performance of SRI funds. The study analyzes the trends in the literature and suggested "best practices" (sample size, period of the analysis, and use of multifactor measures). For the studies that use conventional funds as a benchmark, we analyze the use of the matched pair and the number of matching criteria. For studies that use an index as a benchmark, we observe differences between studies that use conventional indices, SRI indices, or both. The results suggest that performance may not be the key issue. The chapter concludes with a debate on critical issues: the need for clearer definitions, disclosures, and standards, the relevance of the screening process of SRI funds, and the specific characteristics of SRI funds.

CHAPTER 3:

We perform a comparative analysis between SRI funds and Conventional Funds of the same Mutual Fund Company to test the consistency of SRI funds with their identity in Chapter 3. The results show that "self-declared" SRI Funds with ESG consideration in their prospectus is a significant variable that affects positively (negatively) the ESG performance score (sustainability risk) of the funds. From a multi-regional perspective, we find evidence that funds with portfolios investing in Europe present a higher ESG performance than those invested in the USA, and funds invested in Emerging Markets present a lower score performance than those in the USA.

CHAPTER 4:

In Chapter 4, the empirical study aims to analyze the effect of the Sustainable Financial Disclosure Regulation (SFDR) on the ESG scores of SRI funds. For that purpose, we perform a comparative analysis between self-labeled SRI funds and Conventional Funds of the same Mutual Fund Company to test if the pressure of the SFDR regulation has incentivized improvements in ESG scores. We gather a database of portfolio ESG scores before SFDR and three and six months after the entry into force of the SFDR to measure the impact. The results find evidence and reveal a clear reduction of ESG risk and an increase in ESG performance after the SFDR regulation for all the samples analyzed and for the three dimensions of the ESG. We also observe a positive spill-over effect of the regulation on conventional funds after the entry of the regulation.

Resumen

Las inversiones socialmente responsables han ido creciendo, dejando de ser un nicho en el mercado. Entre las ISR destacan los fondos de inversión al ser un tipo de activo mayoritario. Este crecimiento de los fondos ISR ha ido acompañado de dudas y preocupaciones por parte del mercado y los académicos: ¿sacrifican los fondos ISR rentabilidad por seguir los criterios ASG? ¿son los fondos ISR fieles a su mandato de sostenibilidad o están realizando "greenwashing"? y ¿cuál es el impacto de la regulación SFDR en los fondos ISR? Con esta tesis, se busca profundizar en estas cuestiones que generan un gran debate en el mundo académico y en los mercados financieros.

CAPITULO 2:

El debate sobre la rentabilidad de los fondos ISR ha pesado sobre el sector durante décadas. ¿Se puede ser bueno y rentable al mismo tiempo? ¿Hay que sacrificar rentabilidad para ser bueno? Se trata del choque entre dos corrientes la clásica de Friedman y la teoría de los grupos de interés (stakeholder theory). Esta cuestión se ha tratado en el mundo académico y existen revisiones de la literatura y metaanálisis sobre la cuestión. No obstante, estas revisiones incluían artículos de investigación no solo sobre fondos de inversión sino asimismo incluían compañías y carteras. Por otro lado, se mezclaban también estudios sobre fondos de renta variable, con renta fija, fondos de pensiones y fondos privados entre otros. Tras realizar un proceso sistemático de revisión de la literatura entre 1992- Julio 2021 obtenemos una muestra de 54 artículos. En términos de rentabilidad, un 67% de los artículos muestra que no hay diferencia entre la rentabilidad de los fondos SRI y los fondos convencionales; si excluimos los estudios de evento el porcentaje incrementa al 77%. Descomponemos nuestra muestra entre tres subgrupos: fondos SRI vs convencionales (35 artículos), fondos SRI vs índices (12 artículos) y estudios de evento (7 artículos). Las principales características de la muestra: 50% artículos publicados entre 2010-2021, 72% de los artículos incluyen 30 o más fondos siendo el tamaño medio de 122 fondos por estudio

y el número de medio de años estudiados son 10 años. Asimismo, estudiamos las "best-practices" para los análisis comparativos de rentabilidad: 67% uso de medidas multifactorial y 50% utiliza el "matching pair" para emparejar los fondos. Al no observar diferencias en la rentabilidad de los fondos SRI vs convencionales proponemos mover el debate a las características especiales de los fondos ISR. En el segundo capítulo analizamos si los ESG scores de los fondos ISR son diferentes a los convencionales. Al no haber diferencias en rentabilidad, se genera la duda si el tipo de gestión y las carteras de los fondos ISR son realmente diferentes.

CAPITULO 3:

Recientemente, han aparecido en los medios de comunicación financieros dudas sobre los fondos de inversión relacionadas con un potencial "greenwashing". Realizamos un análisis de fondos ISR emparejados a través de un "matched pair" con cinco condiciones; siendo la más importante que sean de la misma gestora y del mismo estilo y universo de inversión. Obtenemos un panel de 71 fondos (Panel B con 132 observaciones.) y otro de 45 pares (Panel A con 90 observaciones). Nuestra primera hipótesis es que los ESG scores de los fondos "auto-declarados" SRI serán mayores que los fondos convencionales. Nuestros resultados confirman esta hipótesis, ya que ser un fondo "auto declarado" ISR es una variable significativa que afecta positivamente (negativamente) el resultado del ESG score (si hablamos en términos de riesgo sostenible). Existen diferentes niveles de desarrollo en las inversiones sostenibles y diferentes regulaciones por zona geográfica. Nuestra hipótesis 2 propone analizar si los fondos que invierten regiones donde el entorno regulatorio que apoya la sostenibilidad presentan un ESG score más alto. Nuestros resultados apoyan parcialmente esta tesis ya que observamos que los fondos que invierten en Europa presentan un mayor ESG score que los fondos que invierten en América. En términos relativos, los fondos invertidos en mercados emergentes presentan un menor ESG score (más riego sostenible) que los fondos que invierten en América.

CAPITULO 4:

Nuestros resultados del tercer capítulo nos llevan a investigar el impacto de las regulaciones de sostenibilidad sobre los fondos ISR en el tercer capítulo. Utilizamos la publicación de la regulación de la UE para fondos conocida como SFDR para realizar un experimento natural de su impacto. Utilizamos un "matched pair" similar al capítulo 2 y obtenemos un total de 142 fondos para los que obtenemos 3 observaciones en el tiempo: 6 meses antes de la entrada en vigor del SFDR y 3 y 6 meses después de la entrada en vigor. Nuestra hipótesis 1, es que todos los porfolios de los fondos incluidos en el estudio muestran un incremento en sus ESG scores como consecuencia de la presión regulatoria de la regulación SFDR. Los resultados confirman la hipótesis ya que muestran una clara reducción el riesgo ESG tras la entrada en vigor de la SFDR en toda la muestra. Nuestra segunda hipótesis busca analizar si los fondos auto declarados ISR muestran un mayor incremento relativo que los fondos convencionales. En términos relativos, nuestros resultados confirman un efecto opuesto ya que se observa un mejor comportamiento en fondos convencionales tras la entrada en vigor de la regulación que se puede justificar por una anticipación a la regulación entre los fondos ISR y un efecto contagio al empujar a los fondos convencionales debido al incremento de la transparencia. Nuestra tercera hipótesis, propone que los porfolios de los fondos convencionales con base en la UE han experimentado un mayor incremento relativo en sus ESG scores a raíz de la regulación SFDR. Nuestros resultados soportan parcialmente en términos de ESG performance este mejor comportamiento relativo. En resumen, nuestra investigación propone mover el debate del terreno de la rentabilidad hacia un mayor compromiso de los fondos para incluir los criterios ESG en su gestión de forma coherente y transparente y apoyándose por nuevas regulaciones como el SFDR en Europa.

CAPITULO 5:

En este capítulo incluimos las principales conclusiones y contribuciones de la investigación. La investigación contribuye a la literatura académica con las siguientes cuestiones de investigación:

- Analizar la rentabilidad relativa de los fondos de inversión ISR respecto a los fondos convencionales.

- Observar si los scores ESG de los fondos auto nominados ISR presentan mejores ratios que los fondos convencionales.

- Investigar si la regulación SFDR ha sido un motor de cambio en el segmento de los fondos de Inversión resultando en un incremento en los ESG scores de los fondos como resultado de una mayor transparencia y estandarización.

Nuestra revisión sistemática de la literatura presentada en el Capítulo 2 contribuye a la literatura académica en dos maneras. En primer lugar, presenta una selección comparable de estudios empíricos desglosada en tres subgrupos que permite extraer conclusiones. En segundo lugar, nuestros resultados muestran que la media (67% de los estudios) no presenta diferencia o no es significativa estadísticamente en la rentabilidad de los fondos ISR vs los fondos convencionales. Por ello, proponemos mover el debate hacia otros temas críticos en el sector como la verdadera naturaleza de los fondos ISR y la necesidad de nueva regulación.

En el Capítulo 3, realizamos un análisis comparativo de fondos ISR vs convencionales de la misma Gestora de fondos para testear su consistencia con su identidad ISR. Nuestros resultados muestran que los fondos autodenominados ISR es una variable significativa que afecta positivamente en los resultados de los scores ESG. Analizamos nuestros resultados desde una perspectiva geográfica y observamos diferencias entre Américas, Europa y mercados Emergentes. Nuestro estudio contribuye a la literatura académica, al ser el primero en analizar el impacto de la diferencia geográfica dentro de fondos de una misma gestora con diferentes connotaciones ESG. Estas diferencias pueden estar relacionadas con la interpretación de la responsabilidad fiduciaria y el soporte regulatorio.

Por último, en el Capítulo 4, contribuimos a la literatura al investigar el impacto de la nueva regulación SFDR en Europa. Estudiamos el impacto de esta regulación como un motor de cambio en los scores ESG en los fondos de gestión de la misma gestora. Esta contribución estudia la

relevancia de la sede central de las gestoras al tratarse de una regulación europea y su impacto en otras regiones. Estos resultados serán útiles en el futuro para teorizar sobre el impacto de regulaciones de carácter obligatorio relacionadas con la sostenibilidad en el sector financiero cada vez más afectado por la globalización.

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ABBREVIATIONS

CF Conventional Fund

ESG Environment, Social, and Governance

EU European Union

PAI Principal Adverse Impact

SFDR Sustainable Finance Disclosure Regulation

SRI Socially Responsible Investment

USA United States of America

Chapter 1: Introduction

In the following introductory chapter, we will present briefly the research performed around Socially Responsible Investment (thereafter SRI) Funds in this thesis. We will address the motivation behind the research question, the research objective, and the methodology used in the process. Furthermore, we will present an overview of the structure and contents that we will see in the next chapters.

1.1 MOTIVATION

In the last decades, sustainable finance has grown from niche to mainstream (Revelli, 2017) as Environment, Social, and Governance (thereafter ESG) considerations have been included by investors in their decision-making. The raising awareness of the challenge brought by climate change and the support of society, investors, and regulators have been behind this growth. This strong growth has been accompanied by certain doubts around three main issues.

First of all, the doubt about the performance of SRI funds. Most recent research has been data-driven and has concentrated on measuring the relative performance of SRI funds vs conventional funds (thereafter CF) and has become one of the most researched topics around SRI funds (van Dijk-de Groot & Nijhof, 2015)). Do SRI funds sacrifice performance to do good? Do SRI funds achieve an outperformance vs conventional funds due to the inclusion of ESG considerations in their investment decisions? There has been a strong debate in the markets and in the academic world around these two contradictory perspectives. Several literature reviews and meta-analyses have been published, however academics have not been able to arrive at a definitive conclusion as they have used different approaches and benchmarks in their analysis.

As academics have researched some consensus around the performance of funds, other issues of concern have appeared in the market. Recently we have seen in the financial press potential greenwashing cases of fund management companies such as Fidelity, Blackrock, or Deutsche Bank. These fund management companies have been accused of overstating their commitment and the resources involved in the management of the funds from an ESG perspective. This could eventually be perceived as a mis-selling of the products and could result potentially in future lawsuits from clients and most important, a loss of trust from clients. As mentioned before, academic papers have analyzed the differences in performance, but we propose to move the debate to ESG score performance as sustainable investors pursue a double utility from their investment (Bollen 2007; Pástor et al. 2021).

Finally, as we mentioned this growth has come with potential issues of greenwashing but also criticisms of lack of transparency, accountability, and standardization in the industry. The financial markets need to face this challenge. The EU stands as a leader in the field of Sustainable Finance and has introduced the Sustainable Finance Disclosure regulation (thereafter SFDR). Until now research has focused on the impact of voluntary and mandatory regulation from companies' point of view and different theories behind companies' motivation to disclose non-financial information (signaling, legitimacy, and institutional theories among others). To fill this gap, we propose to analyze the impact of this regulation on SRI fund ESG scores performance.

1.2 RESEARCH OBJECTIVES

The main objective of this research is to analyze the issues around SRI funds such as relative performance, nature of the investments, and impact of regulation. Therefore, this Ph.D. dissertation wishes to attain this goal by focusing on the following research objectives:

- To examine the published literature reviews and meta-analyses with a strict screening process to focus on the issue of the relative performance of active equity SRI funds vs their conventional counterparts. This objective wishes to contribute to academic research by arriving at a comparable sample of academic research to see if we can extract lessons and conclusions from three decades of research in this field.

- To analyze if SRI funds are true to their nature and exhibit higher ESG scores than their matched conventional counterparts from the same fund management company. With this research, we wish to contribute to the issue of potential greenwashing in the SRI fund industry where previous academic research has shown mixed results.

- To investigate if the mandatory disclosure SFDR regulation in the EU has been a driver for change in the EU performing an empirical analysis obtaining data points from different time frames (before the SFDR and 3 and 6 months after the entry of force of the legislation). In this regard, we expect this research to contribute to the impact of mandatory regulation related to ESG in the subfield of investment funds.

1.3 RESEARCH METHOD

To achieve the research objectives presented in the section approach we will use a combination of different research methods. Firstly, we propose a systematic literature review (Okoli & Schabram, 2011), to address the doubts and issues around performance. This literature review will have a strict universe selection and screening process for SRI active equity fund papers from 1992 when the first paper was published (Luther et al, 1992) to July 2021. We will separate our sample into three subsamples (SRI funds vs CF, SRI funds vs indices, and Event studies) to analyze for potential differences. This will allow us to arrive at a truly comparable sample of

empirical papers on the topic and observe if we can extract any conclusions, observe trends and find "best practices" from more than three decades of research.

If the key difference between SRI funds and CF is not financial performance, then are the portfolios of SRI funds any different from their conventional counterparts in terms of ESG performance?. Therefore to address the second research objective, we propose an empirical analysis that will test the following hypothesis: 1) The ESG score of the portfolio of the "self-declared" SRI funds with ESG considerations in their prospectus show a higher score than their matched CF and 2) Those funds with a portfolio invested in a geographic area with a regulatory framework that supports sustainability present higher ESG scores. For this purpose, we will create a sample of SRI funds using a matching approach similar to Belghitar et al (2017) that showed Fund Management Company played a major role in the matching. We use a 1 vs 1 approach and five matching criteria. We perform a regression linear regression model using variables that have been used in previous related academic research (Alda, 2020; Gangi & Varrone, 2018; Nitsche & Schröder, 2018; S. Utz & Wimmer, 2014). Furthermore, we use two different ESG providers of information (ESG performance Thomson Reuters – Eikon and sustainability risk from Morningstar) to address the divergence observed between ESG information providers (Berg et al., 2019).

Finally, to address the final research objective we use a panel data methodology with the aim of addressing the existence of latent unobservable effects specific to each fund. SFDR publication is used as a natural experiment to analyze the effects of this intervention. Our purpose is to observe if the SFDR has been a driver for change while testing different geographical areas that could be affected by their specific institutional context, sustainability regulation and interpretation of ESG (Amir & Serafeim, 2018). Therefore, in chapter four we will test the following hypothesis: 1) All portfolios, including the non "self-declared or published" SRI funds, have experienced an increase in their ESG scores as a result of the pressure of the SFDR mandatory regulation, 2) if "self-declared or published" SRI funds, have

experienced a higher increase in their ESG scores than their conventional counterparts and 3) if the portfolios of the "self-declared or published" SRI funds with headquarters in the EU have experienced a stronger relative increase in their ESG scores as a result of SFDR regulation. For this purpose, we propose a similar matching approach of self-labeled SRI funds matched with their conventional counterparts from the same fund management company and same investment universe and style.

1.4 STRUCTURE AND CONTENTS

This PhD dissertation is structured in five chapters that are summarized below. In this first chapter, we introduce the motivation behind the dissertation, the research objectives that we are addressing, and the methods that we will use to study and address the research gaps that we have found.

The following chapters include three research papers that address each one of the mentioned research objectives. In each of these chapters, we will include a similar structure. We will start with literature review, detail the methodology and data collection process, present the empirical results from the study, discuss the findings and at the end present the main conclusions.

At the end of the dissertation, in chapter five we will include our overall conclusion covering all the issues addressed in the three chapters. We will dwell on the implications and contributions of the research and present future avenues of research related to the three research objectives.

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Chapter 2: Is performance the key issue in SRI funds? Conclusion and lessons learned from three decades of studies

In Chapter 2 we address the issue of the performance of SRI funds. This issue has attracted a lot of attention and research, but no conclusive answer has been reached as empirical papers have been using different benchmarks, measures of performance, and funds that hold different asset classes. Therefore, we realize a systematic literature review of more than three decades of studies in order to extract conclusions around the topic and observe trends in the literature and best practices suggested.

This chapter is a pre-print version of the following chapter: Susana Martinez Meyers, María Jesús Muñoz, Idoya Ferrero Ferrero, "Is performance the key issue in SRI funds? Conclusion and lessons learned from three decades of studies", published in Contemporary Issues in Sustainable Finance – Exploring Performance, Impact, edited by Prof. Mario La Torre and Dr. Sabrina Leo, 2022 reproduced with permission of Springer Nature.

This chapter proceeds as follows: first is the introductory section, Section 2 reviews previous literature; methodology and data collection are detailed in Section 3, Section 4 presents our results, Section 5 is the discussion and finally, our main conclusions are exposed in Section 6.

2.1 INTRODUCTION

We are facing a new scenario where different threats are arising connected with globalization and environmental considerations like climate change. In this context, investors are increasingly including ESG considerations as they are worried about how these risks may impact the companies included in their portfolios. The traditional market view has been skeptical of the financial impact of including ESG considerations that reduce the investment pool for fund managers (the portfolio theory: Markowitz, 1959; Sharpe, 1964). However, the stakeholder theory points in the other direction and recent academic s are showing ESG as a competitive advantage. This debate has attracted academic attention, making studies that focus on the performance of SRI among the most influential and most researched topic in the field (van Dijk-de Groot and Nijhof 2015).

2.1.1 Theories that support underperformance of SRI funds

According to the classical financial theories, we should expect conventional funds (non – SRI) to outperform Socially Responsible Investment (thereafter SRI) funds as they have access to a non-restricted pool of investments. The proponents of the traditional Portfolio Theory (Markowitz 1959; Sharpe 1964) imply that restrictions in the investment universe may prevent optimal portfolio creation resulting in equal or lower performance of the restricted pool vs conventional funds (thereafter CF). This screening process could result in eliminating from the investment universe not only certain companies, but entire industries or sectors, such as Tabaco, Gambling, or Defense. Therefore, a restricted universe could result in a potential financial sacrifice (Gasser et al. 2014; Trinks and Scholtens 2017) and additional costs associated with the screening and monitoring process (Cummings 2000; Gregory et al. 1997).

The "shunned-stock hypothesis" points out that social investors may create a shortage of demand for irresponsible assets, which in turn can affect stock behavior and create

opportunities for the "sin" stocks (Hong and Kacperczyk, 2009; Derwall et al. 2011 and Han et al 2021). From another point of view, green investments are efficiently hedging climate risk (Jin et al. 2020) so firms with higher carbon emissions exhibit a higher return as compensation for their higher carbon risk (Bolton and Kacperczyk 2021).

2.1.2 Theories that support outperformance of SRI funds

The stakeholder theory suggests that a firm has other groups that have a "stake" in the company apart from shareholders. These stakeholders have a moral claim on the company and firms should create value for all stakeholders (E. R. 1984 Freeman, 1984: R. E. Freeman & Dmytriyev, 2020). A corporation that considers stakeholders' needs in its managerial decisions may result in higher value creation over time (Donaldson and Preston 1995; Freeman and Cavusgil 1984).

This value creation could be linked to sustainable firms having a better social image, brand loyalty (Heal 2005, Flammer 2015, Albuquerque et al 2019, Albuquerque et al. 2020, and Omura 2020), lower downside and bankruptcy risk (Cooper and Uzun 2019; Verwijmeren and Derwall 2010) and could be linked to higher productivity (Flammer 2015). Furthermore, sustainable businesses exhibit often good quality management (Siddiq & Javved 2014, and Omura et al, 2020). As a result, social responsibility can become a source of competitive advantage (Porter & van der Linde, 1995; Porter, 1991). This results in a positive link between Corporate Social Responsibility (thereafter CSR) and corporate financial performance (Bofinger et al., 2022; Filbeck et al., 2009; Huang et al., 2020; Margolis et al., 2011)

Additionally, SRI investors could potentially benefit from a smaller information asymmetry between investors and companies (Cho et al., 2013; Cui et al., 2018; Hamilton et al., 1993). From a portfolio selection point of view, the "errors-in-expectations hypothesis" points out that CSR information is relevant, and the market fails to incorporate it accurately and timely

into the stock price. Sustainable firms tend to be underpriced and thus could deliver abnormally high returns for SRI (Derwall 2011). In this sense, the process of screening and selecting companies with high ESG scores could result in outperformance of SRI funds vs CF as the restricted pool from which the managers select could be a better pool (Barnett and Salomon 2006). Furthermore, SRI funds present a more concentrated portfolio that could result in a stronger knowledge of their holdings which could lead to better fund performance.

As we have seen, the relative performance of SRI investments has not been exempted from controversy and debate about these two contradictory perspectives. The increasing volume of academic literature with different approaches and uses of benchmarks in their calculations has made it hard to establish conclusions and has revealed a lack of agreement. This paper aims to perform a literature review on the specific topic of the relative performance of SRI funds vs their conventional counterparts and, from there, to move the debate to other critical issues apart from purely return measures. We believe a focused systematic literature review could help us to answer the following research questions: Can we extract any conclusions about the performance of active SRI equity funds vs conventional funds from almost 3 decades of research? Are there any best practices and do they show a relationship with relative performance results? Are there any subfields of research that bring new light to the topic or create debates that must be addressed?

The systematic literature review presented here draws on more than 30 years of academic research on SRI equity fund performance. It examined more than 420 academic studies to arrive at a final selection of 54 comparable academic papers. The literature review also provides an overview of the best practices and identifies the trends of the empirical studies reviewed.

This review of SRI fund performance offers two main contributions. First, it offers a selection of truly comparable empirical studies categorized into two groups that are broken into three subsamples that allow us to extract conclusions. Second, our findings show that on average (67% of the studies) there is no difference or that the difference is not significant, and therefore,

we propose to move the debate from the financial paradigm of SRI funds to other critical issues.

The paper proceeds as follows: after this introductory section, Section 2 reviews previous literature; methodology and data collection are detailed in Section 3, Section 4 presents our results, Section 5 is the discussion and finally, our main conclusions are exposed in Section 6.

2.2 PREVIOUS LITERATURE

There have been previous attempts to synthetize this growing field of research. We categorize them into three groups. The first group includes broad literature reviews that research the link between performance and SRI investments both through direct investment (firms/stock) and through pooled investments such as funds/portfolios. The first paper to perform a critical review of the literature on SRI is "Socially responsible investments: Institutional aspects, performance, and investor behavior" (Renneboog et al. 2008a). This work summarizes the findings of 16 papers that study the performance of SRI funds vs Index or Conventional Funds that hint, but not univocally demonstrate, that SRI investments perform worse than conventional funds. Wallis & Klein (2015) performed a more extensive study (54 studies on funds, indices, and portfolios vs their conventional benchmarks for the period of 1986-2012) and Junkus and Berry (2015) combines in their analysis firms and portfolios of different asset classes. AitElMekki, (2020) and C. S. Kim, (2019); aggregate in their meta-analysis a performance analysis of SRI including different asset classes (SRI funds, SRI stocks, and SRI portfolios) vs conventional funds and indices. Friede et al. (2015) combine 2200 empirical studies and observe significant differences in the results between the sample of portfolio studies and the non-portfolio.

We categorize the second group as focused literature reviews on the topic of performance of SRI funds. Chegut et al. (2011) studies five main themes around proposed best practices such as data quality, social responsibility verification, survivorship bias, benchmarking, and sensitivity and robustness checks. Rathner, (2013) performs a meta-regression using a logit model of analyzing the impact of selection criteria on performance and concludes that the survivorship consideration increases the probability of better relative performance of SRI funds. Revelli & Viviani (2015) analyze the relationship between SRI and performance to determine if the inclusion of ESG criteria is more profitable on a sample of 85 papers and 190 observations. The conclusions suggest that the inclusion of this criterion neither implies a weakness nor strength vs traditional investments and that differences in return are derived from the choices made by researchers in their empiric research. C. S. Kim, (2019) performs a meta-analysis of 51 papers up to 2016. The paper argues that cultural differences may be affecting the SRI picture and therefore center their research only on the USA market.

In the third group, we find academic papers that use alternative approaches: influential literature analysis of the most cited research papers on the topic (Hoepner and McMillan 2009) and content analysis on literature trends around SRI investing (Capelle-Blancard and Monjon 2012).

2.3 DATA

2.3.1 Data Collection

We perform a systematic and reproducible search process (Okoli & Schabram, 2011), screening for SRI equity funds papers (not vs created portfolios or other financial asset classes). We focus on academic papers (peer-review) written in the English language from 1992 (the first known

published paper on the topic by Luther et al) to July 2021 when we performed the search. The keywords include the most used terms in relation to SRI funds. The wildcard (*) and the OR term were used to increase the research. The papers for the review were retrieved using Thomson Reuter Web of Sciences (WoS) and Scopus. In Table 2.1, we see keywords strings used that yield a total of 420 papers after eliminating duplicates. Furthermore, we have looked at previous Literature Reviews and Meta-Analysis in the field to check cross-references.

Table 2.1. Keyword strings used in the search process

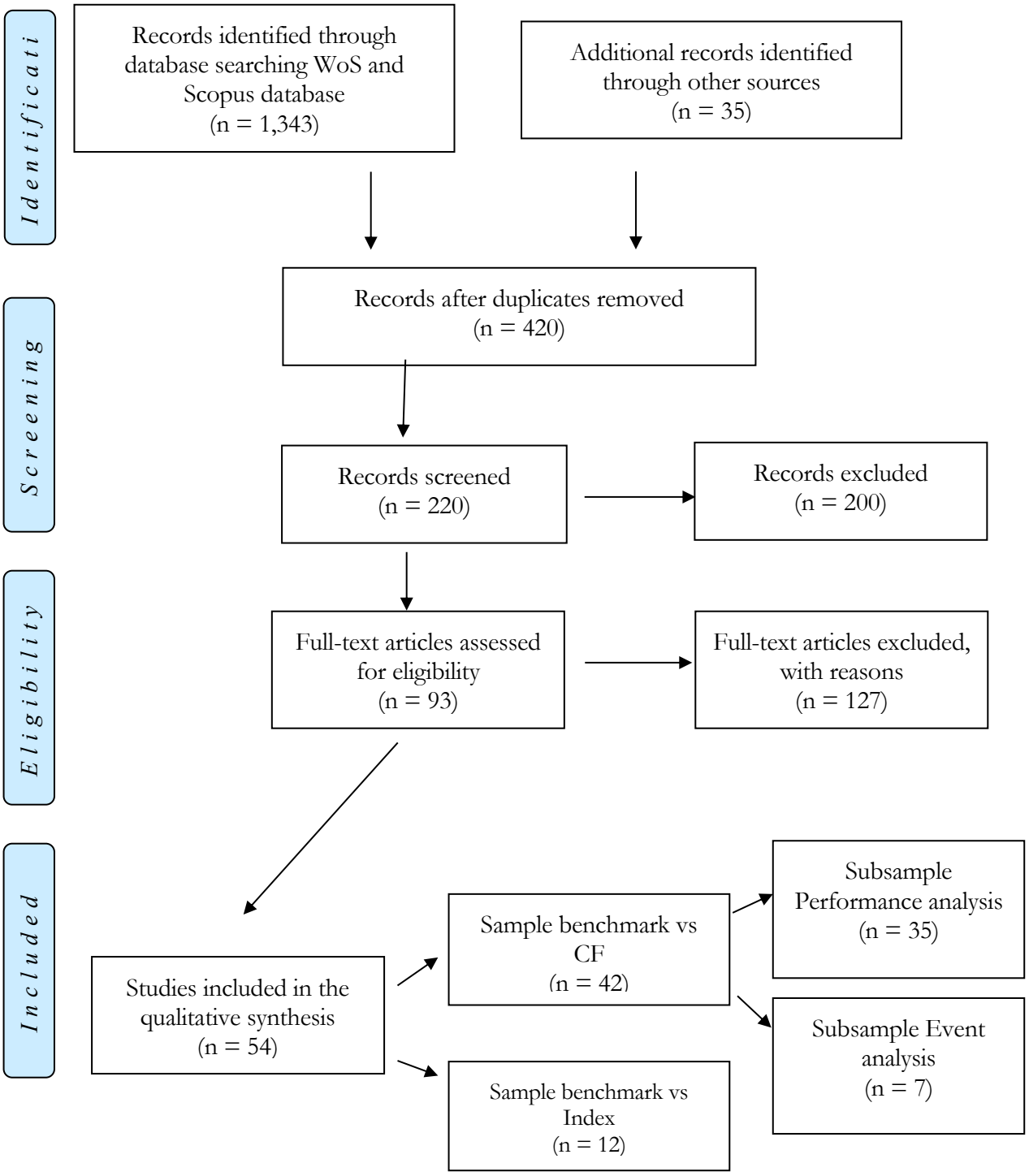
SEARCH	KEYWORDS		
1	Performance +	social* responsible +	Mutual fund*
2	Performance +	social* responsible +	Investment fund*
3	Performance +	SRI +	Mutual fund*
4	Performance +	SRI +	Investment fund*
5	Performance +	Ethic* +	Mutual fund*
6	Performance +	Ethic* +	Investment fund*
7	Performance +	Ethic* +	Invest* trust*
8	Performance +	ESG +	Mutual fund*
9	Performance +	ESG +	Investment fund*
10	Performance +	Environmental, social & governance +	Investment fund*
11	Performance +	Sustainabl*	Mutual fund*
12	Performance +	Sustainabl	Investment fund*

For each article the abstract was downloaded, and we performed a manual data cleaning. We completed a screening for inclusion to reach a maximum level of comparability. As pointed out by Kim, the lack of sound papers is affected by the "diversity and complexity of existing studies with regard to samples, methodologies, performance measures, investment universe, benchmarks, etc." (2019, p.3). Our first criterion is to differentiate into two samples depending on the benchmark used for comparison. In the first sample, we select papers that study Social Responsible Funds vs CF. Papers in this sample compare financial instruments that have similar constraints (regulatory, costs, investment universe, type of management…). The

performance of investment funds is affected by specific costs such as fees, transaction costs, or management compensation plans. The second sample selects studies that research SRI funds vs an index. In this sample, studies compare the performance of an active investment (SR investment fund) vs a passive investment (index) which requires no decision making and does not have the same scrutiny in the equity selection process as a fund (Bauer et al. 2006). To our knowledge, we are the first paper to analyze this difference in our sample and observe potential differences depending on the benchmark used.

Our second criterion is to exclude from our review all empirical papers that use constructed portfolios for analysis and not actual investment funds. A constructed portfolio (ex-post) does not replicate real-life situations of choices and constraints that SRI or conventional fund managers may encounter. Our third criterion is to focus on studies that compare equity investment funds. Different asset classes may be affected by asset allocation issues, investment trends, different regulatory requirements (equity vs pensions funds), or different interest rate sensitivity (equity vs bonds). In this sense, we excluded academic studies (excluded papers list for this criterion is available upon request to researchers) that invest in other types of assets: Pension Funds (Ferruz et al. 2010; Martí-Ballester 2015), Fixed income funds (Derwall and Koedijk 2009; deVilliers 1998; Girard et al. 2007; Henke 2016; Kiymaz 2019; Scholtens 2005), Private Equity and ETF´s (Folger-Laronde et al. 2020). Furthermore, we exclude studies that focus on a specific subset of SRI responsible funds such as Green and Climate Funds (Dopierała et al., 2020; Ibikunle & Steffen, 2017; Silva & Cortez, 2016). As can be in Figure 1, we use the PRISMA Flow to summarize the process (Moher D, Liberati A, Tetzlaff J 2009).

FIGURE 2.1. Prisma Flow of Literature Review Search process



2.3.2 Sample Description

As can be seen in Table 2.2, we arrive at a sample of 54 papers that we divide into 42 studies that use conventional funds as a benchmark and 12 studies that use an index as a benchmark. Due to the specific characteristics of Event studies (analyzing performance before and after an event), we separate them into a subgroup. Therefore, the sample that uses conventional funds as a benchmark is broken down into two subsamples: 35 performance studies and 7 event studies. The full detail of the papers included in each sample can be seen in the appendix (Table A, B, and C).

Around 50% of the studies have been published in the last decade. In terms of geography: the *USA is the country that has been studied more times* on an individual basis (up to 17 times), with the UK in a second position (7 times). This could be related to the size of the market and the availability of databases and information. As can be seen in table 2.2, most of the studies in the analysis (72%) have over 30 funds. Studies that include more than 100 funds are Regional (Europe) or Multiregional. The only individual country that has a sample size above 100 is the US. The *average sample size is 122 funds*. The average may be affected by the large sample size of Becchetti et al. (2015) study; if we eliminate this academic paper from the average the sample size falls to 100 SRI funds. The average sample of the subset of studies vs the index is 146, much higher as there are no restrictions associated with the matching process. The *average period of sample is close to 10 years* in all the subsets; with more than 85% of the papers with a sample of five or more years.

Table 2.2. Sample description

	vs Funds	vs Index	Event	TOTAL
Studies published before 2000	11%	17%		11%
Studies published between 2000-2009	43%	50%		39%
Studies published from 2010-2021	46%	33%	100%	50%
Studies 30 or more SRI funds	71%	58%	100%	72%

Average sample of SRI funds	82	146	272	122
Min sample of SRI funds	13	7	35	7
Max sample of SRI funds	340	748	1,213	1,213
Average number of years in study	10,3	9,5	8,9	10
Min number of years in study	1	5	1	1
Max number of years in study	21	13	19	21
TOTAL OBSERVATIONS	35	12	7	54

2.4 RESULTS

As summarized in Table 2.3, our findings show that 67% of total selected studies find no difference or the difference is not statistically significant between both types of investments (the percentage increases to 77% if we exclude event analysis). We don't observe significant differences between the sample of funds (77.1%) and the sample of index studies (75%). Our findings are in line with the findings of C. S. Kim, (2019) and von Wallis & Klein, (2015). This result is in line with the "no net effect" theory that states that the effects of using in SRI investing a hybrid of exclusion and positive screening could end up canceling each other out (Derwall et al., 2011).

Table 2.3. Main Findings

PERFORMANCE RESULTS PER STUDIES	Vs Funds	Vs Index	Event Studies	TOTAL
Number of studies No difference	27	9	0	36
No difference as a %	77%	75%	0%	67%
Outliers:				
Number of studies where SRI funds outperform	2	1	2	5
Number of studies where SRI funds underperform	3	2	-	5
Number of studies with Mixed results	3	-	5	8

2.4.1 Evolution and trends

In Table 2.4, we study the trends and evolution of best practices in the measurement of relative performance linked to higher sample size, the inclusion of survivorship adjustments, longer periods of analysis, matching variables and their sensitivity, and the more recent use of propensity matching score in the matching process as seen in Alda (2020), Ammann et al. (2019), Bilbao-Terol et al. (2017), Ghoul & Karoui (2020), and Hoe et al. (2017). The use of multifactor performance measurements (mainly Carhart four-factor) has advantages in the portfolio performance valuation. Full details of the sample and analysis per paper are available upon request.

Table 2.4. Trends in research

	PERIOD 1 Before 2000	PERIOD 2 2000-2009	PERIOD 3 2010-2019	TOTAL	TOTAL
	%	%	%	Number Studies	%
Sample above 30 funds	33%	62%	89%	39	72%
Period of years 10 or above	33%	57%	59%	30	56%
Multifactor measures	33%	62%	78%	36	67%
Matching (1-1 and 1 vs many)	50%	33%	63%	27	50%
RESULT: No Difference	100%	76%	59%	38	70%
TOTAL OBSERVATIONS				54	100%

In the sample that uses an index as a benchmark, 50% of the sample use a conventional index, 42% use both (conventional and SRI) and only one paper uses only a SRI index. In this case, the debate has dwelled on which of the options of indices is more appropriate as a benchmark. Studies show that conventional indexes appear to be more useful and have a higher explanatory value (Bauer et al. 2005; Bello 2005; Cortez et al. 2009; Leite and Cortez 2014a).

2.4.2 Best practices that have been evolving through the literature

Furthermore, we analyze different subfields of research that have been emerging: 1) Pioneers (studies in decade 1, early 2) Matched pair (focus on the matching process, for example, Mallin & Saadouni, (1995) as the pioneer, Renneboog et al., (2008b) as an example of a detailed multiregional matched pair and Gil-Bazo et al., (2010) with a matched pair analysis based on 6 criteria), 3)Attributes (difference in attributes of SRI funds from CF for example in terms of Timing and Stock picking skills like Benson et al., (2006) and Kreander et al. (2005) or Style analysis like Bauer et al., (2005, 2007), 4) Measures (new approaches to the measurement of performance calculation; mainly DEA conditional approaches like Basso & Funari, (2014a), Ito et al., (2013), and Pérez-Gladish et al., (2013)) and 5) Event analysis where 71% of findings were mixed results. The events studied are the financial crisis (86% of the studies), the tech bubble (57% of the studies), and the euro sovereign crisis (29% of the studies). Arefeen & Shimada, (2020), is the exception with a focus on the impact of US elections and Brexit on Japanese SRI funds. There is a perception that SRI funds could work as insurance protection from ethical risk (Becchetti et al. 2015) and could decrease downside risk (Nofsinger and Varma 2014). Nevertheless, other studies showed that performance was different depending on the crisis studied (Arefeen and Shimada 2020; Becchetti et al. 2015).

Table 2.5. Subfields of research

PERIODS	Before 2000		2000-2009		2010-2019		TOTAL	
	#	%	#	%	#	%	#	%
Pioneers	6	100%	2	10%		0%	8	15%
Matched Pair		0%	3	14%	3	11%	6	11%
Attributes		0%	8	38%	7	26%	15	28%
Measures		0%	8	38%	10	37%	18	33%
Event		0%		0%	7	26%	7	13%
TOTAL OBSERVATIONS	6		21		27		54	100%

2.5 DISCUSSION

After our analysis, we can conclude that on average (67% of the sample), studies show no difference or statistically no significant difference between SRI and their benchmark. We want to point out relevant issues that have appeared in the Literature Review apart from the purely financial paradigm of SRI funds.

2.5.1 Are SRI Funds really SRI? The need for clearer definitions and regulation

One of the key issues after all the debate is the underlying doubt about SRI funds. In the early years after the appearance of SRI funds, they were not perceived as a serious alternative as their financial returns were very poor (Barnett and Salomon 2006). Furthermore, just being categorized as an SRI mutual fund does not always guarantee the exclusion of unethical firms (Capelle-Blancard and Monjon 2014; Kempf and Osthoff 2008; Utz and Wimmer 2014). Are SRI investments true to their identity? Are SRI funds conventional funds in disguise? Academics have shifted the debate from performance issues to the holding composition of SRI funds. SRI funds have been observed to present different industry betas that are consistent

with different portfolios (Benson et al. 2006) and present higher ESG scores (Alda 2020; Joliet and Titova 2018; Kempf and Osthoff 2008; Nitsche and Schröder 2018). However, other studies have observed lower corporate social performance (Gangi and Varrone 2018) raising doubts about agency and fiduciary duties, and adoption of the Principles of Responsible Investing has not been linked to an actual improvement in ESG scores and engagement (S. Kim & Yoon, 2020).

SRI continues to be a concept hard to describe or relate to with just one doctrine, as it has become a multidimensional concept of heterogeneous groups with different needs (Sandberg et al. 2009). We are facing the challenge to create a theory that captures multiple definitions of ESG from the wide and diverse investor community (Daugaard 2019). The issue will be partially addressed through the introduction of common standardized definitions that will give practitioners and academics the assurance that we are comparing similar financial instruments. The EU taxonomy is a start that could act as a catalyzer for a more consistent categorization as fund managers will have information such as the percentage of the business activities covered by the taxonomy and what percentage is taxonomy aligned. The taxonomy list is not exhaustive and is expected to increase in the future as other critical factors such as Social is not included at present.

2.5.2 . Are all SRI funds equal? What about greenwashing? The need for benchmarks of disclosures

SRI investors are not a homogenous group and differences between funds could reflect differences in values, norms, and ideologies of investors (Sandberg et al., 2009). Can we declare equal all SRI approaches? Are SRI funds vs CF a dichotomous variable? To address these issues a higher disclosure is key. As mentioned previously, SRI funds have been accused of greenwashing and results have been mixed with papers raising concerns about potential greenwashing (Gangi & Varrone, 2018; Gibson et al., 2020; Kim & Yoon, 2020; Leite & Céu

Cortez, 2014; Liang et al., 2021; Utz & Wimmer, 2014) and other papers supporting the true nature of SRI funds (Alda, 2020; Benson et al., 2006; Joliet & Titova, 2018; Kempf & Osthoff, 2008; Nitsche & Schröder, 2018). Depending on the market and region, disclosure has been divided into voluntary and mandatory. The move to global guidelines for CSR / ESG data reporting and global standards, such as the Global Reporting Initiative (GRI) and more recently IFRS Sustainability Disclosure Standards, will increase reporting and harmonization (Einwiller et al. 2016; Fortanier et al. 2011). Scholars argue that refinement in the regulatory system will decrease greenwashing (Seele & Gatti, 2017). The growth in regulation has been a key factor behind the growth of assets in SRI (Siri and Zhu 2019).

The EU has been a driver in terms of regulation and most recently with the SFDR regulation in force since March 2021. The SFDR will require financial market participants and advisers to follow mandatory disclosures on the integration of sustainability risks and the consideration of adverse sustainability impacts. Furthermore, fund managers must disclose if they categorize themselves as 1) financial product that promotes Environmental and social characteristics (article 8 or "light green"), or 2) financial product that has an objective of positive impact on the environment and society (article 9 or "dark green". Becker et al., (2021) address the impact on funds ESG scores of SFDR regulation and observed an increase in ESG scores and fund net inflows for the EU fund group after the policy announcement vs the USA.

Independent verification of SRI funds (not required currently under SFDR) is one of the main concerns, as pointed out by Chegut et al. (2011). However, markets are becoming increasingly more aware of the complicated procedure behind the process of measurement of factors like corporate environmental performance (Escrig-Olmedo et al. 2017). Some new questions are arising about if all rating agencies have the same idea and process of measurement of ESG factors and how they transmit sustainability to the assessed companies (Muñoz-Torres, Fernández-Izquierdo, Rivera-Lirio & Escrig-Olmedo, 2019) which have risen doubts on their

reliability and the divergence between them (Berg et al. 2019; Christensen et al. 2021; Dimson et al. 2020; Gibson et al. 2019; Yang 2020).

2.5.3 The Screening process may be the key

Several academics have approached the paradox by analyzing the impact of screening criteria. Simple negative screens associated with exclusion strategies have been associated with lower diversification, increased risk (Humphrey & Lee, 2011), and underperformance (Capelle-Blancard and Monjon 2014; Leite and Cortez 2015). On the other hand, positive screening such as "best in class" has been associated with reducing fund risk and outperformance (Goldreyer and Diltz 1999; Kempf and Osthoff 2007; Nofsinger and Varma 2014). Screening practices may also vary depending on geographical regions (Renneboog et al. 2008b, 2011). Not only the type of screening, but the intensity, could impact performance as a too high intensity of screening has been related to poor fund diversification (Barnett & Salomon, 2006; Capelle-Blancard & Monjon, 2014). Furthermore, the number of screens (Fernández Sánchez and Luna Sotorrío 2014) and sector-specific screens such as environmental screens may reduce financial performance (Barnett and Salomon 2006; Renneboog et al. 2011) as compared to more transversal screening criteria which may not result in a lesser diversification (Capelle-Blancard and Monjon 2014).

2.5.4 Do SRI funds exhibit different characteristics?

The first decade of studies showed specific interest in the issue of small-cap exposure of SRI funds as was initially pointed out by Luther et al., (1992) and later observed by other studies (Bauer et al. 2006; Gregory et al. 1997; Gregory and Whittaker 2007; Nofsinger and Varma 2014). As pointed out by Leite & Cortez (2014b), the study observes differences in small-cap biases linked to the market of the fund with European funds more exposed to small caps.

However, in a more recent study, they observed a lower exposure to small caps than conventional funds that could be justified by the "best in class" approach (Leite & Cortez, 2015).

There have been some mixed findings on whether SRI funds exhibit a growth or value bias. Some studies (Bauer et al. 2005; Gregory and Whittaker 2007; Kempf and Osthoff 2008) find a more growth bias that according to Benson et al., (2006) could be linked to the difference in industry exposure of SRI funds vs conventional funds. SRI funds may result in a different style of investment like "growth" or "value" investments, style references widely used in the investment world. As seen by Leite & Cortez (2014a), SRI funds may present lower exposures to book-to-market factors.

2.5.5 Looking forward: Is performance the key issue for SRI investment?

Let´s point out what may seem obvious; if SRI funds' rationale is to go beyond purely financial measures, why is then financial performance such a key issue? (Capelle-Blancard and Monjon 2012). As we have found through our analysis and previous references suggested, we see that, on average, the performance between both types of funds shows no difference in the studies analyzed (67%).

Among those reasons, investor behavior arises as a key one; investors in SRI funds may be motivated by other reasons apart from performance and may derive a utility from holding consistent with a set of personal values or societal concerns (Bollen 2007; Pástor et al. 2021). There have been described behavioral differences between the SRI investor and the conventional investor in terms of aversion to unethical behavior apart from the common risk aversion which could suggest that SRI investors may require a lower return to invest in companies that present a lower ethical risk (Renneboog et al. 2008a).

The financial performance of funds is affected by a variety of drivers like diversification, stock cycle, quality of fund management, and not only if ESG factors are considered in the investment process. As Peylo & Schaltegger (2014) comment, it is "quite possible that relationships between sustainability and financial performance elude measurability because they may be overshadowed and dominated by other, more powerful or temporarily more influential factors".

2.6 . CONCLUSION

After addressing the debate and controversy surrounding SRI funds and performance; the findings of our literature review show that 67% of the studies that analyze SRI funds' performance vs conventional funds or indices show no difference or the difference is not statistically significant. However, in the end, we have seen that achieving an absolute truth is complicated. Performance of SRI funds may be more linked to other attributes that could relate to the talent of managers, type of screen and intensity, investment management company specialization, regulation impact, geographic location, or management style. As SRI has become mainstream, comments around potential "greenwashing" of the sector, and doubts about if SRI funds are true to their identity, have increased. One of the key areas for future research could be a deeper analysis and categorization of SRI funds depending on their ESG ratings, screening approach, and SFDR categorization. References of which ESG Portfolio Score ratings are more relevant for investment fund managers in their screening process which will allow them to measure and categorize the portfolio of SRI funds more efficiently. However, ESG data quality and complexity remain a challenge. Furthermore, extending the literature review to study other asset classes such as corporate fixed income (green, social, and sustainable bonds), sovereign bonds, pension funds, or other thematic investments such as green funds.

We have reasons to be optimistic that some of the issues mentioned in our discussion are starting to be addressed by practitioners and regulators as is the case of the EU addressing issues such as the taxonomy and disclosure regulations in funds (SFDR), and incorporation of sustainability considerations in financial advice. In this acceleration of the ESG momentum, it would be a great opportunity to extend benchmarks and taxonomies within an international platform to englobe investors of all regions and with specific consideration for emerging markets that could move to adopt higher CSR standards (Li et al. 2010) and promote a sustainable investing approach.

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APPENDIX CHAPTER 2

Table A. Subsample of SRI equity funds vs index

	PERFORMANCE	COUNTRY OF FUNDS	PERIOD OF STUDY	#SRI FUNDS	CONVENTIONAL INDEX	SRI INDEX	MULTIFACTOR
Luther et al., 1992	no difference or weak	UK	1984-1990	15	1	0	0
Luther & Matatko, 1994	no difference or weak	UK	1985-1992	9	1	0	1
Cummings, 2000	no difference or weak	AUS	1986-1994	7	1	0	0
Schröder, 2004	no difference or weak	Netherlands	1990-2002	46	1	1	1
Shank et al., 2005	no difference or weak	US	1993-2003	12	1	0	0
Scholtens, 2007	no difference or weak	Netherlands	2001-2005	7	1	1	1
Jones et al., 2008	underperformance	AUS	1986-2005	89	1	0	1

Cortez et al., 2009	no difference or weak	7 European countries	1996-2007	88	1	1	1
Lean et al., 2015	Outperformance	Europe and USA	2001-2011	748	1	1	1
Syed, 2017	no difference or weak	UK and France	2004-2009	44	1	0	0
Reddy et al., 2017	no difference or weak	UK	2004-2014	37	0	1	1
Azmi et al., 2020	underperformance	Global	2002-2013	658	1	1	1

Table B. Subsample of SRI equity funds vs conventional funds

#	AUTHOR	PERFORMANCE	COUNTRY OF FUNDS	PERIOD OF STUDY	#SRI FUNDS	FREE SURVIVORSHIP	MATCHING 1-1	MATCHING 1VS MANY	# OF MATCHING CRITERIA	MULTI FACTOR
1	Hamilton et al., 1993	No difference	USA	1981-1990	32	0	0	1	1	0
2	Mallin & Saadouni, 1995	No difference or weak	UK	1986-1993	29	0	1	0	2	0
3	Gregory et al., 1997	No difference or weak	UK	1986-1994	18	0	1	1	4	1
4	Goldreyer & Diltz, 1999	No difference	USA	1981-1997	49	0	0	0	2	0
5	Statman, 2000	No difference	USA	1990-1998	31	1	0	1	1	0
6	Bauer et al., 2005	No difference	Multi region	1990-2001	103	1	0	1	2	1
7	Bello, 2005	No difference	USA	1994-2001	42	1	0	1	1	0
8	Geczy 2005	Underperformance	USA	1999-2001	49	1	0	0	0	1
9	Kreander et al., 2005	No difference	Europe	1995-2001	30	0	1	0	4	1
10	Bauer et al., 2006	No difference	Australia	1992-2003	25	1	0	0	0	1
11	Lozano et al., 2006	No difference	Spain	2002	14	0	0	0	0	0
12	Benson et al., 2006	No difference	USA	1994-2003	185	0	0	0	0	0
13	Bauer et al., 2007	No difference	Canada	1994-2003		0	0	0	0	1
14	Bollen, 2007	Mixed	USA	1990-2002	188	1	0	0	0	0

15	Gregory & Whittaker, 2007	No Difference	UK	1989-2002	32	1	0	1	2	1
16	Koellner et al., 2008	Mixed	Europe	2000-2004	13	0	1	0	1	0
17	Fernandez-izquierdo & Matallin-saez, 2008	No difference or Outperformance	Spain	1998-2001	13	0	0	0	0	1
18	Kempf & Osthoff, 2008	No difference	USA	1991-2004	72	1	0	0	0	1
19	Renneboog et al., 2008b	Mixed	Multi region	1991-2003	340	1	0	1	4	1
20	Gil-Bazo et al., 2010	Outperformance	USA	1997-2005	86	1	0	1	6	1
21	Rodríguez, 2010	no difference	USA	1997-2005	31	1	1	0	2	1
22	Humphrey & Lee, 2011	No difference	Australia	1996-2008	27	1	1	0	3	1
23	Ito, Managi, & Matsuda, 2013	Outperformance	Multi region	2000-2009	109	0	0	0	0	0
24	Pérez-Gladish, Rodríguez, M'zali, & Lang, 2013	No difference	USA	2007	46	0	0	0	0	1
25	Fernández Sánchez & Luna Sotorrío, 2014	Underperformance	Europe	1993-2012	184	1	0	1	1	1
26	Basso & Funari2014b	No difference	Europe	2006-2009	190	0	1	0	2	0
27	Basso & Funari, 2014a	No difference	Europe	2006-2009	189	0	1	0	2	0

28	Leite & Cortez, 2015	No difference	Europe	2000-2008	54	0	0	1	4	1
29	Muñoz et al., 2015	No difference	USA	1994-2010	153	1	0	0	0	1
30	Ayadi et al., 2015	No difference	Canada	1988-2008	67	1	0	0	0	1
31	Day et al., 2016	no difference	Multi region	2008-2013	15	0	1	0	0	0
32	Belghitar et al., 2017	No difference	UK	2001-2011	23	0	1	0	4	1
33	Rahman et al., 2017	No difference	USA	2004-2013	67	1	1	0	2	1
34	Qiu et al., 2018	Underperformance	USA	2001-2016	84	1	1	0	4	0
35	Matallín-Sáez et al., 2019	No difference	USA	2000-2017	202	1	0	1	1	1

Table C. Subsample of event analysis of SRI equity funds

#	AUTHOR	COUNTRY OF FUNDS	PERIOD OF STUDY	#SRI FUNDS	FREE SURVIVORSHIP	MATCHING 1-1	MATCHING 1VS MANY	# OF MATCHING CRITERIA	MULTI FACTOR
1	Nofsinger & Varma, 2014	USA	2000-2011	240	1	0	1	3	1
2	Becchetti et al., 2015	Multi region	1992-2010	1213	1	0	1	3	1
3	Leite & Cortez, 2015	France	2001-2012	40	0	0	1	2	1
4	Gangi & Trotta 2015	Europe	2008-2012	107	0	1	0	4	1
5	Lesser et al., 2016	Multi region	2000-2012	213	1	0	1	3	1
6	Nakai et al., 2016	Japan	2008	62	0	0	0	0	1
7	Arefeen & Shimada, 2020	Japan	2016	35	0	0	0	0	1

Chapter 3: Are Sustainable Funds doing the talk and the walk? An ESG score analysis of Fund portfolio holdings.

In chapter 3, we perform a comparative analysis between SRI funds and Conventional Funds of the same Mutual Fund Company to test the consistency of SRI funds with their identity. The results show that "self-declared" SRI Funds with ESG consideration in their prospectus is a significant variable that affects positively (negatively) the ESG performance score (sustainability risk) of the funds. From a multi-regional perspective, we find evidence that funds with portfolios investing in Europe present a higher ESG performance than those invested in the USA, and funds invested in Emerging Markets present a lower score performance than those in the USA.

This chapter is structured as follows: after an introductory section, Section 2 covers an updated framework on the topic, definitions, and debates around the topic; methodology and data collection are detailed in Section 3, Section 4 presents our findings, Section 5 is the discussion of the findings and finally, our main conclusions are exposed in Section 6.

3.1 INTRODUCTION

Socially Responsible Investments (SRI) have grown exponentially moving from niche to mainstream going into a quest for profitability (Revelli, 2017), and attracting the debate of academics, firms, and investors. Influenced by these interests and attention, fund management companies have rushed to satisfy the demand by creating new SRI-targeted funds and reacting to the threat of low commissions of passive funds. There has been a strong academic and market discussion around Socially Responsible Investments (thereafter SRI) investments and their performance. Do SRI investors sacrifice performance to be good? The debate has been summarized in literature reviews and meta-analyses (Capelle-Blancard & Monjon, 2012; Chegut et al., 2011; Hoepner & McMillan, 2009; Junkus & Berry, 2015; C. S. Kim, 2019; Rathner, 2013; Renneboog et al., 2008a; Revelli & Viviani, 2015; von Wallis & Klein, 2015) with the most recent ones pointing out that Environment, Social and Governance (thereafter ESG) considerations neither imply weakness nor strength and that both types of funds show similar performance (Capelle-Blancard & Monjon, 2012; Chegut et al., 2011; Hoepner & McMillan, 2009; Junkus & Berry, 2015; C. S. Kim, 2019; Rathner, 2013; Renneboog et al., 2008a; Revelli & Viviani, 2015; von Wallis & Klein, 2015). If there are no differences in performance, then are portfolios of socially responsible firms are any different from Conventional Funds (thereafter CF)? Are self-labeled SRI funds better in terms of ESG scores than their conventional counterparts? Or are they using SRI as a marketing tool? Are they "greening" their names to look more attractive under the growing ESG investor and social demand? Are they doing "greenwashing"?

The paper aims to test if SRI funds (thereafter SRF) are true to their identity through a comparative analysis of the funds´ ESG scores using two proxies: ESG performance (Refinitiv Eikon database) and sustainability risk (Morningstar database). We will test empirically a multi-region representative sample of pairs of funds composed of a self-labeled SRF and their conventional equivalents found using a five criteria "matched pair" approach (same investment fund company, geographical area of investment, investment size and style, size, and age of the fund). Our results show that the variable SRI is significant in relation to the ESG score of funds. It could be interpreted that SRI funds with ESG consideration in their prospectus are aligned with their identity and nature. Furthermore, we observe geographical differences that could be related to the supporting regulatory environment and interpretation of ESG as part of the fiduciary duty.

3.2 THEORETICAL BACKGROUND AND HYPOTHESIS

The increased social pressure has moved companies from the classical shareholder approach (Milton Friedman, 1970) to the stakeholder approach (Donaldson & Preston, 1995; R. E. Freeman & Dmytriyev, 2020; S. Freeman & Cavusgil, 1984) which could become a source of competitive advantage and could be a motivation for higher disclosure of non-financial information. However, there have been some cases of companies disclosing large quantities of ESG to present an environmentally responsible public image while actually having a bad ESG performance (Furlow, 2010; Ramus & Montiel, 2005; Yu et al., 2020) or engaging in a selective disclosure (Lyon & Maxwell, 2011; Marquis et al., 2016) or as a way of manipulating information so part of the audience may relax the scrutiny (Mobus, 2005). Concerns about greenwashing and rainbow washing (linked to Sustainable Development goals) have increased after the explosion the sector has experienced linked with the new awareness brought by Covid-19 (Crabb, 2020). During Covid-19, stocks with high ESG stocks have been linked to positive stock performance (Albuquerque et al., 2020) and are being seen as an insurance or source of protection during crisis periods (Becchetti et al., 2015; Gregory, 2022; Nofsinger & Varma, 2014). The concerns around greenwashing have also affected the investment community. Fund managers with a sustainable focus include screening criteria to measure companies' extra-financial performance based on the corporate ESG data. The lack of common definitions around screening, measures, or requirements has been defined as one of the main barriers to SRI investing and as s source of market distortion (Muñoz et al., 2021). Therefore, it is hard to measure if SRI-labelled funds are genuine, transparent, and ethical which is not always the case (Schwartz, 2003).

Studies have focused on the performance; while SR funds have a second objective which is to comply with ethical principles (Capelle-Blancard & Monjon, 2012; Utz & Wimmer, 2014a) as part of SRI investors may be "value-driven" (Derwall et al., 2011; Muñoz, 2019; Muñoz et al., 2014), more flow persistent (Muñoz, 2019) and derive a utility by being consistent with a set of personal values or societal concerns (Bollen, 2007) or even a disutility from holdings of brown firms (Pástor et al., 2021). Therefore, the potential misclassifications or mis-selling of these products could lead to a potential agency problem. Some investment funds could be tempted to use "SRI", "green", "Sustainable" or "ESG" labels as a marketing tool without being fully supported by their investment choices. There has been an increase in the repurposing of funds to make them greener. Stuart (2021) published in Morningstar that in 2020, the repurposed funds could represent between 10-20% of the sustainable fund universe.

Ghoul & Karoui, (2020) found that frequent name changes include the words "sustainable", "ESG", "green" and "impact". The changes were observed to be beneficial for funds flows and were not cosmetic changes as they were accompanied on average by a rebalancing of the portfolio.

In this move towards the mainstream, fund managers are moving to an ESG integration approach (Alda, 2020; Revelli, 2017) with several of the biggest investment fund companies (Blackrock, Fidelity, Deutsche Bank…) declaring that their whole platform of funds will include ESG considerations in the investment decision process. This evolution makes sense for large institutional investors categorized as universal owners where their performance is linked to the overall state of the markets and the economy. As a reference, the release of the Corporate Governance Code of the Norway Sovereign Wealth Fund acted as an example of low-cost activism with high firm influence (Aguilera et al., 2019). However, doubts have arisen in the financial press. Fidelity appeared on the publication of a report on greenwashing by the wealth manager SCM Direct and after the financial press echoed the information. Fidelity has commented that due to a mistake or "glitch" in the filtering of Fidelity Funds, there appeared 49 of its own funds branded as "SRI" when only one fund of the whole list fell under this category. These funds were sold to customers under this consideration and now Fidelity is considering if they may have to compensate clients for this misdealing categorization. In the case of Deutsche Bank, US authorities announced in the summer of 2021 that they were investigating DWS (asset management branch of Deutsche Bank) for a potential overstating of their sustainable investment efforts and the percentage of assets invested using an ESG integration approach. The research group Influence Map found that 71% of ESG equity funds portfolios were not Paris aligned. The market is talking about potential lawsuits linked to mis-selling or mis-categorizing of funds.

3.2.1 SRI funds and their true identity: "Greenwashing" concerns.

Apart from these market references, several academic papers have raised concerns. For S. Utz & Wimmer (2014), the label "Social Responsible Fund" does not always guarantee the exclusion of unethical firms and could be more of a marketing tool than a guarantee. Looking at the exposure of SRF to indices, studies have shown that SRF are more exposed to conventional indices than to socially responsible specific indices (Bauer et al., 2005; Bello, 2005; Cortez et al., 2009; Leite & Cortez, 2014). Focusing on ESG scores of portfolio holdings,

Gangi & Varrone (2018) observed potential agency conflicts as SRF showed a poorer Corporate Social Performance and achieved a worse risk-adjusted return than CF.

Becoming a signatory of the United Nations Principles for Responsible Investment (PRI) has been used as a proxy of commitment to ESG. Gibson et al., (2020) found that committed PRI investors exhibit a better ESG footprint except for US-domiciled companies which exhibited a worst relative performance consistent with greenwashing. Kim & Yoon, (2020) found a worst engagement (signatories did not improve the ESG fund score post endorsement, addressed fewer votes in relation to environmental issues and there was an increase in environmental controversies in their holdings). Liang et al., (2020) observed that 20.79% of signatory hedge funds presented lower ESG scores than the median Hedge Fund firm.

In contrast, other academic research findings support the consistency of the SRF with their identity and nature. From the point of view of industry sectors, it has been observed that SRF displayed different industry betas which is consistent with different portfolio positions (Benson et al., 2006). Kempf & Osthoff, (2008), find that US SRI Equity funds exhibit higher ethical standards and therefore it could be argued that "they are not ethical funds in disguise". Contrasting with the previously mentioned, using ESG scores Joliet & Titova, 2018 (with a focus on US equity funds in the period 2005-2009), Nitsche & Schröder, 2018, (studied the top 10 fund holdings of European and Global funds) and Alda, 2020 (tested UK SRI pension funds matched using the nearest-neighbor matching approach) found higher sustainability scores of SR investments than their conventional counterparts.

Table 3.1 Summary of Literature Review

AUTHOR	PERIOD & SOURCE OF DATABASE	SOURCE ESG SCORES	MATCHED PAIR APPROACH	MAIN HYPOTHESIS TESTED	RESULTS	RESULTS UNTRUE NATURE O FUNDS (1 no)
Benson et al., 2006	94-2003 USA	Not used	No	Are SRI funds investing in stocks that in aggregated look any different from CF?	Different industry betas which is consistent with different portfolio	0
Kempf & Osthoff, 2008	91-2004 USA	KLD Rating	No	Do SRI funds have higher ethical ranks than CF?	The study shows that US SRF have a significantly higher ethical ranking than CF and therefore should not be considered conventional funds in disguise.	0
Utz & Wimmer, 2014	2002-2012 USA	Asset4 (Reuters), Bloomberg	No	Do SRF are higher if ranked by ESG scores? Do SRF show higher ESG scores than CF?	SRI mutual funds were not holding considerably more ethical assets on average and they did not guarantee the exclusion of unethical firms.	1
Joliet & Titova, 2018	2009-2015 USA	Sustainalytics	Yes	Do SRF tend to invest in co with higher ESG scores?	ESG performance of portfolio companies is on average higher for SRF, which is especially true for U.S.- focused funds.	0
Nitsche & Schröder, 2018	2012 Global	Oekom, Sustainalytics and Asset 4 (Reuters)	No	Are the top 10 fund holdings of SRF different from the holdings of CF? Do SRF have higher ESG rankings than CF? If SRF have higher ESG rankings, are the absolute rating differences statistically significant?	The results show that Top 10 portfolio holdings of both fund types have overlaps however SRF obtain on average better ESG rankings than CF which are statistically significant.	0

Gangi & Varrone, 2018	2009-2014 Europe	Reuters	No	Do the co selected by SRF exhivit better CSP than co selected by CF? Do co selected by SRF exhibit worse CSP than co selected by CF?	Results show that firms held by SRFs exhibit poorer CSP than firms selected by CFs.	1
S. Kim & Yoon, 2020	2006-2018 USA	MSCI, Sustainalytics, and TruValue Labs	Yes	Do funds experience changes in the flows after signing PRI? Do signatories change portfolio holdings to incorporate ESG?	Signatories show an improve fund flow after signing and PRI funds on average do not improve ESG fund scores after signing and they vote less on environmental issues and their stock holdings experience increased environment related controversies	1
Alda, 2020	2016-2018 UK	Morningstar	Yes	Do SR pension funds present higher ESG scores than Conventional pension funds?	Results show that SRF present higher scores than CF. They observe a greater concern about environmental issues on SRF	0

Considering the mixed results and controversy summarized in Table 3.1, we wish to contribute to the growing debate about the challenges of mainstream SRI by testing the following

Hypothesis: H1: The ESG score of the portfolio of the "self-declared" SRI funds with ESG considerations in their prospectus show a higher score than their matched CF.

The fund mandate has a binding nature of a public commitment (Dolvin et al., 2019) that we confirm through the Morningstar fund snapshot which includes a binary option if the fund is a sustainable fund by prospectus. We want to analyze if self-labeled SRFs are true to their fiduciary duty and if they accompany the green talk with a portfolio selection that results in higher relative ESG scores which then could be "green highlighting" (Walker & Wan, 2012).

3.2.2. Impact of institutional context

Fund managers have a fiduciary duty towards investors to follow the investment approach established in the fund mandate. Investors are being incentivized through growing society, regulatory and industry pressures to act more responsibly (Gibson et al., 2020). Since the launch of PRI in 2009, it is becoming internationally accepted (Alda, 2020) to include ESG considerations as part of the fiduciary duty. However, this acceptance has not been equal around the world reflecting cultural, institutional, and regulatory differences. There are different country levels of commitment and differences in the degree to which investors are aware of such commitment (Takahashi & Yamada, 2021). Studies have shown how the political context of nations could be impacting Corporate social performance (Ioannou & Serafeim, 2012). CSR disclosure could be affected by higher regulation and investor protection (de Villiers & Marques, 2016) and by countries with a stronger environmental agenda (Glennie & Lodhia, 2013). Europe has been perceived as the leading region with a higher adaptation rate of ESG (Kaiser, 2020), a stronger belief of fund managers in the positive impact of SRI (van Duuren et al., 2016), and greater demand from European institutional investors (Dyck et al., 2019).

Could the differences in ESG performance be explained by regulation? Is the regulatory context preventing "greenwashing"? This study proposes to test the following

Hypothesis: H2: Those funds with a portfolio invested in a geographic area with a regulatory framework that supports sustainability present higher ESG scores.

3.3 DATA AND METHODS

3.3.1 Data Collection

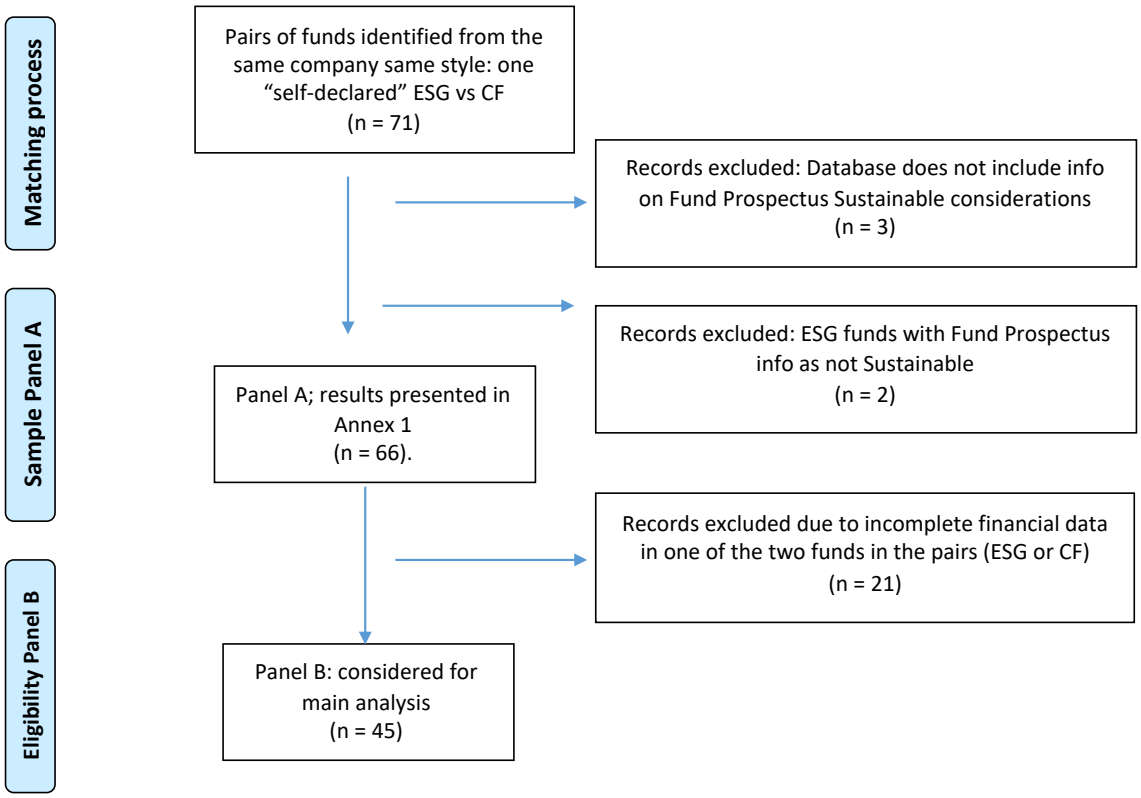
We perform an analysis focused on active equity funds self-labeled as SRI. We focus on active Equity funds, as they represent the largest worldwide category (Gangi et al., 2020). Using the fund management tools on the Morningstar website in December 2020; we search for funds that are specifically advertised as SRI or that the name of the fund includes terms such as ESG, SRI, Sustainable, Social, Ethic, green, clean, carbon, climate, responsibility, sustainability, or Ethical (similar to the approach used by Takahashi & Yamada, 2021). We argue in line with Joliet & Titova, (2018) that the funds that include such references have proven voluntarily their willingness to include ESG considerations. In contrast with the previous literature, which mainly focused on US-based funds, we propose a multi-regional approach that has not been tested from the ESG score perspective ((Nitsche & Schröder, 2018 focused on top ten holdings, and Gibson et al., 2020 tested PRI signatories and not self-labeled funds).

We use a matched pair approach, presented by (Mallin & Saadouni, 1995), to select the appropriate benchmark for our SRF. The most recent papers propose the use "r:1" nearest neighbor matched method introduced by Rubin (1973). The matching is done with a Propensity score to reduce bias (Alda, 2018; Ammann et al., 2019; Bilbao-Terol et al., 2017; Day et al., 2016; Ghoul & Karoui, 2020; Joliet & Titova, 2018). In this chapter, we don´t apply the matching by propensity scores due to our matching requirements linked to our purpose which is to observe differences in the agent's behavior (fund management company´s) funds self-declared as ESG (purpose of double utility for the investor) vs CF.

We use a matching approach similar to Belghitar et al (2017) that showed Fund Management Company played a major role in the matching. We use a 1 vs 1 approach and five matching criteria: same management Fund company (maximum of 5 funds per asset management company for diversity), geographical area of investment, investment size, and style according to the 9-grid box from Morningstar and we finish with the first factors observed to impact fund performance which are: the age of the fund and the size (Nanda et al., 2009; Ruenzi, 2005).

Our sample is affected by the number of criteria included in the matching approach. The two most restrictive criteria are the same management company and the same investment style. From the whole universe screened, we obtain an initial 71 matched pairs of funds (Panel B with 132 observations) which are reduced to an eligible sample of 45 pairs (Panel A with 90 observations) after restrictions of disclosed/available data.

Figure 3.1: Detailed process of Sample creation



3.3.2 Methodology - Linear Regression Model

This study estimates the linear regression model shown in Equation 1 with the aim of testing the above-mentioned hypotheses. This study applies in the estimator process the use of a robust variance matrix in presence of heteroskedasticity. Additionally, the potential problem of multicollinearity has been explored by means of the variance inflation factors (VIF). The VIF values are below 3, therefore, multicollinearity is not a concern.

$$ESG_i = \beta_0 + \beta_1 \cdot SRI_i + \beta_2 \cdot Europe\ Area_i + \beta_3 \cdot Asia\ Area_i + \beta_4 \cdot Emerging\ Area_i + \beta_5 \cdot Global\ Area_i + \beta_6\ Growth\ Style_i + \beta_7 \cdot Value\ Style_i + \beta_8 \cdot Mid\ Size_i + \beta_9 \cdot Beta_i + \beta_{10} \cdot Volatility_i + \beta_{11} \cdot financial\ performance_i + \beta_{12} \cdot Size_i + \varepsilon_i \quad \text{(Eq. 3.1)}$$

The variables included in Equation 1 are consistent with previous research (Alda, 2020; Gangi & Varrone, 2018; Nitsche & Schröder, 2018; S. Utz & Wimmer, 2014). The dependent variable of this study is the ESG score from the most accepted ESG providers of information (ESG performance Thomson Reuters – Eikon and sustainability risk from Morningstar).

The ESG Refinitiv fund score (used by Gangi & Varrone, 2018; Nitsche & Schröder, 2018) measures performance so the higher the better. The eligibility criterion is a minimum of 10 securities and ESG security scores for 70% of the portfolio and the scoring is based on relative benchmarks, a materiality matrix, and transparency weighting. The ESG score is broken down into the 3 pillars and is complemented by the ESG Controversy Score which measures the impact of negative controversy scores. For the Morningstar Sustainability score (used by Alda, 2020; Joliet & Titova, 2018; S. Kim & Yoon, 2020; Nitsche & Schröder, 2018) the focus is risk, therefore the lower the better. The score uses Sustainalytics data, and the eligibility criterion is that at least 67% of the portfolio assets must have an ESG score. From Morningstar, we also include the sustainability Ranking which has substantial credibility in the investment community (Chang et al., 2019) and has been used to observe mandate accountability (Dolvin et al., 2019).

The independent variable is SRI which is a dummy variable that takes the value 1 if the fund is considered SRI in terms of fund name and prospectus. In order to measure the different institutional contexts by geographic area of investment of the fund, this study used the following dummy variables: Europe (including the UK), Asia (including Japan), Emerging Markets, and Global Market. North America (USA and Canada) area is the dummy variable omitted. The study includes as control variables: investment style (Growth Style and Value Style are included; Blend Style is the dummy variable omitted), investment size (Mid-Size is included, Large Size is the dummy variable omitted), Beta for 1 year to last month end, Volatility (measured as Standard Deviation for 1 year to last month end), Financial Performance (1-year performance) and Fund Size measured as logarithm of total assets under management of the fund. The data for the control variables are obtained for all funds on the same date in December 2020 using the Refinitiv Eikon Database.

3.4 RESULTS

Table 3.2 displays the descriptive statistics of the variables included in the empirical analyses. The average ESG performance (sustainability risk) of funds is 67.2376 (22.2516). In average terms, the dimension that presents the most favorable score in both proxies, ESG performance, and sustainability risk, is the social one, and the most unfavorable score is the environmental dimension. Corporate governance is the dimension that shows less variability in the results of the sample. Regarding the geographic area of investment of the funds, Table 2 shows that 21.11% of funds invest in Europe, 24.44% in North America (in particular, the USA), 2.22% in Asia, 11.11% in Emerging Markets, and 41.11% in global markets.

Table 3.2 Descriptive statistics.

	Obs.	Mean	S.D.	25th P.	50th P.	75th P.	Skw.	Kurt.
ESG_PERFORMANCE	90	67.2376	7.0056	62.8363	67.1642	71.5640	-0.4392	3.2922
ENVI_PERFORMANCE	90	63.2057	9.7701	57.5060	63.6438	69.2050	-0.4174	3.1398
SO_PERFORMANCE	90	71.6902	7.8216	66.7992	71.4960	76.7370	-0.4787	3.8986
CG_PERFORMANCE	90	63.6829	4.8006	61.0748	64.4087	66.9030	-0.4671	3.0189
SUS_RISK	90	22.2516	1.9181	21.0200	21.9450	23.2900	0.4516	3.4779
ENVI_RISK	90	3.9159	0.9126	3.2900	3.7650	4.4000	0.7835	3.8871
SO_RISK	90	9.3275	1.0300	8.7100	9.4300	9.9600	-0.5627	3.3707
CG_RISK	90	7.6140	0.7815	7.1900	7.5550	7.9500	0.4121	3.5619
SUS_RATING	90	3.6333	1.0110	3	4	4	-0.4004	2.5968
SRI	90	0.5000	0.5028	0	0.5	1	0	1
EUROPE_AREA	90	0.2111	0.4104	0	0	0	1.4158	3.0045
ASIA_AREA	90	0.0222	0.1482	0	0	0	6.4825	43.0227
EMERGING_AREA	90	0.1111	0.3160	0	0	0	2.4748	7.1250
GLOBAL_AREA	90	0.4111	0.4948	0	0	1	0.3613	1.1305
STYLE_GROWTH	90	0.3000	0.4608	0	0	1	0.8728	1.7619
STYLE_VALUE	90	0.1333	0.3418	0	0	0	2.1572	5.6538
SIZE_MID	90	0.0222	0.1482	0	0	0	6.4825	43.0227
BETA	90	0.9864	0.1201	0.9153	0.9738	1.0280	0.7888	4.1841
STAND_DEV	90	24.8992	3.8772	22.2592	25.0196	26.7024	0.5189	3.8195
FINANCIAL_PERFORMANCE	90	10.7556	12.9045	1.1000	11.0949	17.2957	0.8307	4.4792
SIZE	90	16.5867	3.5218	15.0242	17.0786	18.3600	-0.6551	4.0057

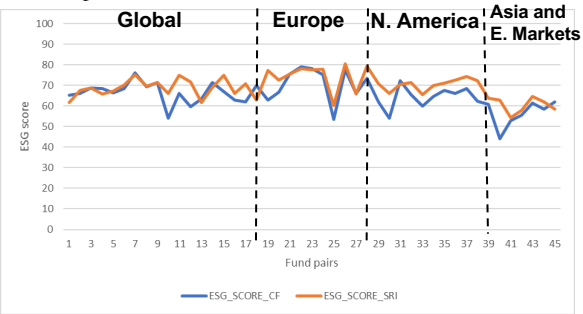
The table shows the descriptive statistics of the data included in panel B

Figure 3.2 shows the ESG scores by matched funds (SRF vs CF) classified by geographic area of investment. On the one hand, it is observed, on average, that those funds that invest in EU companies present a more favorable ESG score (except for environmental risk) and the funds that invest in Asia and Emerging Markets a more unfavorable ESG score. On the other hand, in most cases, the ESG performance (ESG risk) from the SRI fund is higher (lower) than the CF. These differences are less evident in the corporate governance dimension which could be explained because the corporate governance practices are reasonably regulated in the case of the listed companies with best practices internationally recognized and combined with the aftermath of the global financial crisis (Gibson et al., 2020).

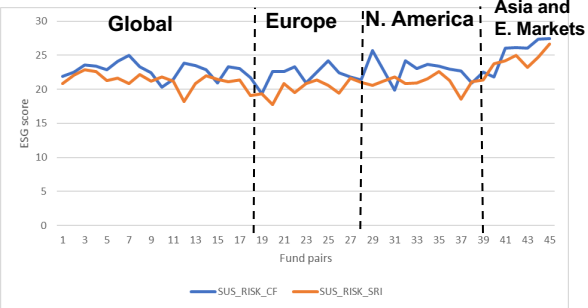
It is also noticed that the differences in the ESG performance between SRF and CF are less substantial in the case of Europe. This convergence could be due to contextual factors. In the case of Europe, there is increasing support for sustainability actions (e.g. "Action plan financing sustainable growth") which could encourage SRI in the conventional mainstream. In the survey of 582 institutional investors Eccles et al., (2017) observed that EMEA looked like the most supportive regulatory environment in ESG while Asia Pacific Region agreed by a higher percentage that there was a lack of standardized regulation in ESG integration.

Figure 3.2 Comparison of ESG score by each pair of funds: SRI fund vs CF fund

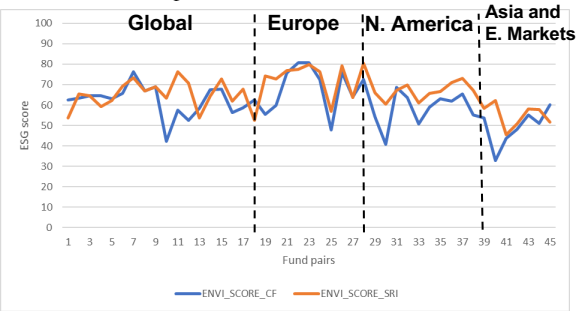
1a. ESG performance



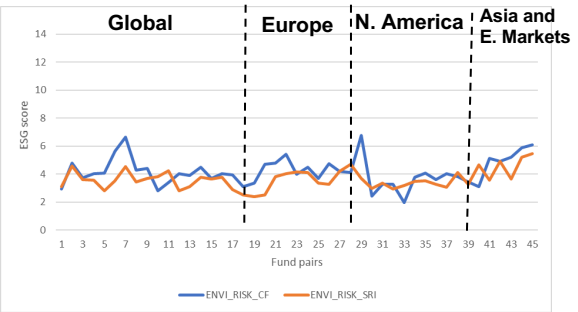
1b. Sustainability risk



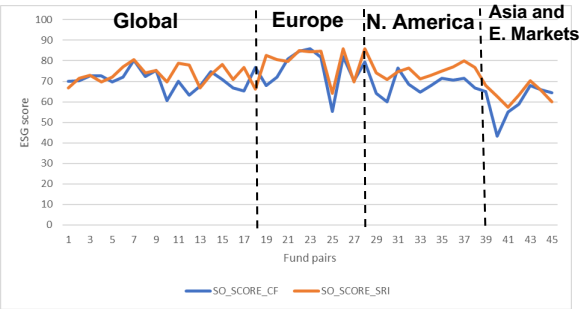
1c. Environmental performance



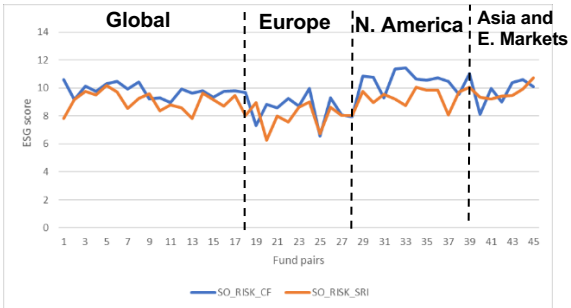
1d. Environmental risk



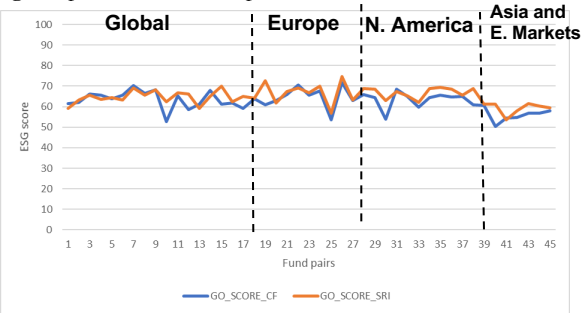
1e. Social performance



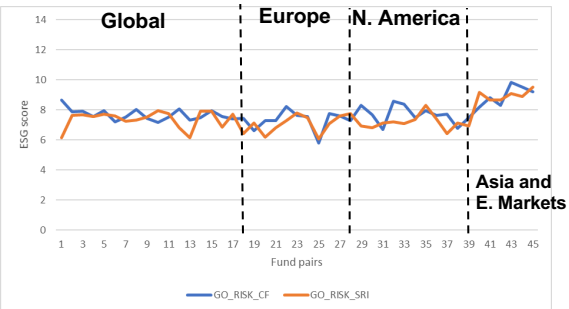
1f. Social risk



1g. Corporate Governance performance



1h. Corporate Governance risk



Tables 3.3 and 3.4 present the results of the regression analysis. Focusing on hypothesis 1, the results find evidence to support it and reveal SRI as a significant variable that affects positively (negatively) the ESG performance (sustainability risk). This relationship is also reflected in the results of the Environmental, Social, and Corporate Governance dimensions.

Regarding hypothesis 2, the results partially support this hypothesis. Focusing on ESG performance, Table 3.3 shows that those funds with a portfolio invested in Europe (Emerging Markets) present higher (lower) ESG performance than those funds that invest in North America. ESG performance in North America vs Europe could be affected by the lower consensus in terms of integrating ESG as part of the fiduciary duty; for example, as has been the case for pension funds and the changing guidelines from the Department of Labor (Gibson et al., 2020). Code law countries (such as the EU) have shown higher support for stakeholder commitments vs law countries like the USA (de Villiers & Marques, 2016). The results for Asia and Emerging Markets are in line with the results obtained by Badía et al., (2020) that pointed out that in the Asia Pacific region "markets seem to view CSR practices as not being able to generate financial benefits, consistent with a more traditional view that CSR". Europe is seen as a region that pushes firms to higher levels of Environment and Social performance (Dyck et al., 2019). In terms of sustainability risks (see Table 4), the results change slightly according to the dimension and the area of investment explored.

Our findings are consistent with Nitsche & Schröder (2018) who observed on average higher ESG scores for European companies than for the US and the Asia Pacific regions and that European funds were on average more sustainable than global funds. In the case of Europe as an area of investment, those funds that construct portfolios based on European companies achieve better levels of social risk than those based on North American companies, however; in terms of the environmental risk, the differences are not statistically significant. Exploring the Emerging Markets, this study finds evidence that this area of investment implies higher sustainability risk, in particular, environmental, and corporate governance risks. Regarding the social risk, the emerging markets do not present statistically significant differences with respect to North America.

Table 3.3 Regression results – ESG performance –THOMSON REUTERS - EIKON

Explanatory variables	ESG PERFORMANCE	ENVIRONMENTAL PERFORMANCE	SOCIAL PERFORMANCE	CORPORATE GOVERNANCE PERFORMANCE
SRI	3.6912***	5.2410***	4.1292***	2.2149***
	(0.7240)	(1.1041)	(0.8167)	(0.5730)
EUROPE AREA	2.8069**	3.4689*	4.8238**	-0.9774
	(1.4016)	(2.0553)	(1.5595)	(1.0921)
ASIA AREA	-11.6959***	-11.5450**	-16.4696***	-7.8228***
	(3.3402)	(5.2276)	(3.6407)	(1.6216)
EMERGING AREA	-9.5282***	-12.1328***	-9.3661***	-8.2979***
	(1.2230)	(1.7960)	(1.6692)	(0.8203)
GLOBAL AREA	-1.2314	-0.9360	-1.0463	-1.9753***
	(1.0224)	(1.5850)	(1.0550)	(0.7383)
STYLE GROWTH	-1.0333	-1.8938	-0.5790	-1.1906
	(1.3662)	(1.9792)	(1.5696)	(0.9587)
STYLE VALUE	-1.9191	-2.7174	-1.8968	-1.6738
	(1.4099)	(1.8877)	(1.6260)	(1.1241)
SIZE MID	-16.0611***	-18.9725***	-19.8458***	-9.3267***
	(2.8381)	(4.5640)	(3.1890)	(1.7565)
BETA	-7.5161	-7.9993	-11.6318**	-.5924
	(4.9771)	(7.1259)	(5.7048)	(3.2401)
VOLATILITY	0.1744	0.3772	0.2558	-0.0434
	(0.1749)	(0.2387)	(0.1951)	(0.1391)
FINANCIAL PERFORMANCE	-0.2857***	-0.4309***	-0.2853***	-0.1958***
	(0.0499)	(0.0723)	(0.0566)	(0.0353)
SIZE	0.0271	0.0247	0.0710	-0.0011
	(0.1039)	(0.1545)	(0.1233)	(.0708)
CONSTANT	73.2410***	65.9172***	78.3059***	69.2671***
	(4.9957)	(7.7463)	(5.7778)	(3.3747)
R^2 overall	0.7935	0.7783	0.7925	0.7282
F- statistic	27.79***	30.80***	23.93***	25.12***
N. obs.	90	90	90	90

The table shows the results of the estimation of the data included in panel B

Standard errors are in brackets. Statistically significant at 1% (***), 5% (**) and 10% (*).

Table 3.4 Regression results – Sustainability Risk – MORNINGSTAR

Explanatory variables	SUSTAINABILITY RISK	ENVIRONMENTAL RISK	SOCIAL RISK	CORPORATE GOVERNANCE RISK
SRI	-1.5273***	-0.5164***	-0.7192***	-0.2938**
	(0.2782)	(0.1538)	(0.1549)	(0.1143)
EUROPE AREA	-1.5464**	-0.0792	-1.9616***	-0.4022*
	(0.6085)	(0.3362)	(0.3561)	(0.2295)
ASIA AREA	1.0674	0.6022	-1.0836	1.4273***
	(1.1462)	(0.5315)	(0.6782)	(0.3753)
EMERGING AREA	3.4353***	1.1530***	-0.2858	1.5504***
	(0.4678)	(0.2807)	(0.2727)	(0.2272)
GLOBAL AREA	0.1706	0.1123	-0.6587***	0.1023
	(0.4286)	(0.2217)	0.2306	(0.1780)
STYLE GROWTH	-0.3078	-0.0474	-0.1336	-0.0867
	(0.3552)	(0.2072)	(0.1869)	(0.1341)
STYLE VALUE	0.4252	0.4214	0.1956	-0.1919
	(0.4340)	(0.2725)	(0.2510)	(0.1824)
SIZE MID	1.3036**	-0.4628	-1.6354***	-1.6101***
	(0.5619)	(0.2940)	(0.4958)	(0.4085)
BETA	1.5553	0.0346	-0.0680	0.0251
	(1.4456)	(0.7881)	(0.7583)	(0.5493)
VOLATILITY	0.0662	0.0320	0.0180	0.0421**
	(0.0463)	(0.0256)	(0.0286)	(0.0198)
FINANCIAL PERFORMANCE	-0.0096	-0.0267***	-0.0098	-0.0098
	(0.01596)	(0.0075)	(0.0094)	(0.0070)
SIZE	-0.0024	-0.0236	-0.0113	-0.0110
	(0.0435)	(0.0195)	(0.0231)	(0.0161)
CONSTANT	19.8330***	3.8200***	10.3894***	6.9023***
	(1.7552)	(1.0098)	(1.0652)	(0.7368)
R^2 overall	0.6862	0.5307	0.6389	0.6599
F- statistic	23.84***	12.03***	9.87***	10.97***
N. obs.	90	90	90	90

The table shows the results of the estimation of the data included in panel B

Standard errors are in brackets. Statistically significant at 1% (***), 5% (**) and 10% (*).

The empirical part of the study has been repeated, extending the sample to 132 funds (note that in this case, the financial variables have been deleted given the non-available data in the database). The annex shows the results. The levels of significance of the coefficients have been not altered substantially. In addition, this study has also regressed the model using "Morningstar-sustainability rating for funds (earth globes)" as a dependent variable (Chang et al., 2019). The results, available upon request, do not reject the validity of the previous empirical part; therefore, they support the findings of this study.

As seen in Benson et al., (2006), we use a Wilcoxon matched-pairs signed-ranks test to analyze if the sector composition of funds holdings is the same independently of the sample it belongs to (SRF vs matched CF). Our results show that we can´t reject the null hypothesis except for the healthcare sector where we could reject the null hypothesis with a 95% confidence (results available upon request). Therefore, this supports our findings that the differences between the performance of ESG scores of SRF vs CF could be explained by geographical contextual peculiarities and not by the sector composition of funds. We analyze the top 10 holdings of both funds and we found that 7 out of the 10 most frequent holdings are common between both types of funds (mainly large caps in the Technology sector).

3.5 DISCUSSION

ESG and Fiduciary Duty

As mentioned previously, the link between ESG and fiduciary duty shows regional differences that affect the institutional context and could explain the differences seen in the results from the different regions. A larger percentage of US investors than European believe that ESG information is not relevant for investment purposes (Amir & Serafeim, 2018). For example, in the USA fiduciary duty was understood as the responsibility of fund managers to maximize the return of the beneficiaries. Gibson et al., (2020), linked the worst ESG performance of US institutions to a

different interpretation and changing guidelines around fiduciary duty in the US market. The evolution of certain capital markets, for example, the case of China, which is underdeveloped, may be affecting the inclusion of ESG considerations within fiduciary duty (Eccles et al., 2017). Could a specific inclusion of ESG considerations in Fiduciary duty become a definite driver for the sector?

A clearer ESG regulation in the field could be key

The previously mentioned lack of a common definition is one of the key issues to be addressed to establish more robust grounds and transparency for the sector. The EU announced in March 2018 a plan for Sustainable Finance with the creation of taxonomy or a unified classification system for all players in the financial sector. The purpose is to define "green" to limit room for interpretation and suggest a "threshold" of quality of information to be considered acceptable with the specific objective of eliminating "greenwashing". The EU is aware that the absence of harmonized rules causes significant distortions in competition (Muñoz et al., 2021) as different disclosure standards could confuse investors making it complicated for them to distinguish between greenwashers and genuine investors (Liang et al., 2021). As mentioned by S. Kim & Yoon (2020), asset managers need to provide clearer information and communication about how they are incorporating ESG to reduce information asymmetries (Schaefer et al., 2015).

In the case of funds, it is especially relevant the regulation on Sustainable Finance Disclosure Regulation (SFDR) that requires mandatory disclosures on the integration of sustainability risks, consideration of adverse sustainability impacts, and fund categorization. The SFDR that was effective as of March 10, 20201, proposes the categorization of funds into three categories: funds with environmental or social characteristics (Article 8 also called "light green"), funds with sustainable investment objectives (Article 9 or also called "dark green") and funds that do not meet the requirements of previous which imply they do not integrate or if so in small degree sustainability into their investment process (Article 6). Becker et al., (2021) have studied the impact on funds ESG scores of SFDR regulation and observed an increase in the ESG score of the EU fund group vs the USA after the policy announcement.

The period selected for our database could explain the difference between other papers mentioned in the literature review. Gangi & Varrone's (2018) study goes from 2009 to 2014 and Kim & Yoon's (2020) from 2006 to 2018. In recent years, we have seen supranational agreements supporting Sustainability such as the Paris Treaty, United Nations Sustainable Development Goals in 2015, and the EU regulation mentioned above that have become milestones. A voluntary CSR approach could have facilitated greenwashing leaving room for grey areas (Gatti et al., 2019), so the move towards common standards, stronger scrutiny (Marquis et al., 2016), and improved accuracy of analysts' forecasts (Aghamolla & An, 2021). Third-party verification could prevent greenwashing concerns as has been observed for audited ESG reports of firms that present a higher assurance of quality (del Giudice & Rigamonti, 2020). The demand for verification of data will require regulators to decide to what extent, by whom verification is provided, and who pays for it (Kolk, 2004).

The impact of ESG Data and Scores

Our results using different ESG scores give evidence that SRI self-labeled funds are true; however, we are assuming that ESG scores are measuring correctly ESG performance of portfolios. Recent academic papers have dwelled on the divergence of ESG ratings (Berg et al., 2019), their actual predictive and signaling value (Yang, 2020), and their variability in time (Berg et al., 2020). ESG ratings have been considered subjective, in part due to the influence of the agency's origins in their conception of sustainability and definition of materiality (Eccles & Stroehle, 2018). This subjectivity lowers litigation risk potential for greenwashers and could result in a model where rating agencies may not invest enough in detecting greenwashing and end up helping corporates to window dress their ESG performance (Yang, 2020). Due to inconsistencies and mis-selling practices among funds, we could see a future wave of "ESG investor lawsuits". In February 2022 Morningstar excluded 1,200 funds from their "sustainable list" due to ambiguous legal language.

3.6 CONCLUSIONS AND IMPLICATIONS

A great part of academic research has focused on financial performance, while the key issue lies in the true nature of SRF. Our analysis adds to previous literature, as up to our knowledge, is the first to perform an ESG fund score analysis addressing the topic if "self-declared" SRFs are true to their nature through a matched pair from the same fund management company and with a multi-regional focus. Using a regression model, the study has documented that SRF (self-declared and by prospectus) is a significant variable in relation to ESG Scores in the funds vs CF in the same fund management company and that funds invested in Europe show an average higher performance than those invested in the USA. The key finding of the paper points out that SRI funds are doing the "walk" and the "talk" and they could be references more to "green highlighting" (Walker & Wan, 2012) than to "greenwashing".

Our study calls for regulators not only in the EU but in the other regions, to support a reduction of greenwashing activities through increased regulation (Gatti et al., 2019; Seele & Gatti, 2017). A strong legal framework can help investors to solve conflicts linked to information asymmetries (Bilbao-Terol, Álvarez-Otero, et al., 2017) which combined with higher scrutiny and enforcement may be a driver to enforce that ESG funds truly act like them. Further research could test the impact of SRF on the recent key regulations in the EU mentioned above (SFDR specifically) and the concept of true identity could be tested from the point of view of indices analyzing ESG scores of SRI indexes vs conventional.

Limitations to our findings could be as mentioned by previous literature, that ESG scores are static (Gangi & Varrone, 2018) while it could be hard to capture the current context post-covid and the quick evolution the sector is experiencing and the fact that SRF is a quite heterogeneous market. The ESG data information and instruments need to become more efficient as one of the key drivers of market efficiency is price transparency, available information for all actors, and active and numerous participants. The growth of Sustainability to mainstream could have harmed the sector (Revelli, 2017); however, the perception could change if the growth is supported by global regulation, increased transparency, and data verification (Popescu et al., 2021) which will lower information asymmetry and reduce risk of greenwashing (Dorfleitner et al., 2021).

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APPENDIX 3

Table A.1 Regression results – ESG performance –THOMSON REUTERS - EIKON

Explanatory variables	ESG PERFORMANCE	ENVIRONMENTAL PERFORMANCE	SOCIAL PERFORMANCE	CORPORATE GOVERNANCE PERFORMANCE
SRI	3.1406***	4.5248***	3.2942***	1.8927***
	(0.7653)	(1.1256)	(0.8340)	(0.6113)
EUROPE AREA	8.4488***	12.3520***	9.5846***	3.9209***
	(1.1851)	(1.8053)	(1.2352)	(.9490)
ASIA AREA	-4.8680	-4.7354	-8.1165*	-2.2759
	(3.3402)	(5.3522)	(4.8562)	(3.0336)
EMERGING AREA	-6.9502***	-7.2136***	-7.5508***	-5.7775***
	(1.4576)	(2.3784)	(1.6573)	(1.0898)
GLOBAL AREA	2.5173**	4.1717**	2.4963**	1.0480
	(1.0635)	(1.6907)	(1.0672)	(0.8863)
STYLE GROWTH	-4.5583***	-7.2364***	-4.0238***	-3.5462***
	(0.9759)	(1.4590)	(1.0410)	(0.7726)
STYLE VALUE	2.0141**	3.3616**	2.1014*	0.7626
	(1.0935)	(1.5037)	(1.1949)	(0.8699)
SIZE MID	-11.9292***	-13.8487***	-14.5255***	-6.7345***
	(2.9597)	(4.7522)	(3.2597)	(2.1568)
CONSTANT	65.1588***	59.5878***	69.2768***	63.4900***
	(4.9957)	(1.6544)	(1.0523)	(0.8579)
R^2 overall	0.6414	0.6028	0.6483	0.5316
F- statistic	33.15***	25.34***	27.66***	24.90***
N. obs.	132	132	132	132

The table shows the results of the estimation of the data included in panel A

Standard errors are in brackets. Statistically significant at 1% (***), 5% (**) and 10% (*).

Table A.2

Regression results – Sustainability Risk – MORNINGSTAR

Explanatory variables	SUSTAINABILITY RISK	ENVIRONMENTAL RISK	SOCIAL RISK	CORPORATE GOVERNANCE RISK
SRI	-1.4940***	-0.3481***	-0.6893***	-0.3719***
	(0.2128)	(0.1204)	(0.1453)	(0.0940)
EUROPE AREA	-0.5497	0.4958**	-1.3935***	0.0654
	(0.3935)	(0.2045)	(0.2284)	(0.1428)
ASIA AREA	2.0026***	1.0291**	-1.2660**	1.1691**
	(0.7468)	(0.4122)	(0.5968)	(0.5210)
EMERGING AREA	3.2361***	1.3002***	-0.3661	1.5526***
	(0.4073)	(0.2176)	(0.2381)	(0.1848)
GLOBAL AREA	0.1159	0.4017**	-0.5527***	0.1333
	(0.3062)	(0.1752)	0.1772	(0.1298)
STYLE GROWTH	-0.7932***	-0.5271***	-0.3266*	-0.3520***
	(0.2595)	(0.1545)	(0.1960)	(0.1275)
STYLE VALUE	0.4221	0.7335***	0.2073	0.0293
	(0.2665)	(0.1693)	(0.1549)	(0.1166)
SIZE MID	1.4804***	0.6055	-0.5031	-0.8537**
	(0.4555)	(0.7150)	(0.8716)	(0.4028)
CONSTANT	22.8452***	3.7021***	10.4073***	7.6514***
	(0.3113)	(0.1909)	(0.1703)	(0.1338)
R^2 overall	0.5671	0.7034	0.4078	0.5502
F- statistic	21.48***	14.07***	8.00***	16.97***
N. obs.	132	132	132	132

The table shows the results of the estimation of the data included in panel A

Standard errors are in brackets. Statistically significant at 1% (***), 5% (**) and 10% (*).

Chapter 4: European Sustainable Financial Disclosure Regulation (SFDR) as a driving force for improving ESG performance in the fund industry

In chapter 4 we perform an empirical study to analyze the effect of the SFDR regulation on the ESG scores of SRI funds. We address the issue by realizing a matched pair analysis of SRI funds vs CF from the same fund management company. Our purpose is to observe what has been the impact on the ESG scores of the holdings on the funds three and six months after the entry on force of this regulation. There have been several voluntary and mandatory regulations in the disclosure of non-financial information mainly for companies. However, the SDFDR that includes the disclosure of principal adverse impact (thereafter PAI) and categorization of funds in article 8 ("light green") and article 9 ("dark green") is a steppingstone in the world of funds. Our model suggests that the SFDR has been a driving force for the whole industry which has experienced an increase of ESG scores. In addition, our results show a positive spill-over effect of the regulation on conventional funds after the entry of the regulation.

This chapter is structured as follows: we have an introductory section, Section 2 covers the literature review and hypothesis development; data collection, variable definition, and methodology are detailed in Section 3, Section 4 presents our empirical findings, and Section 5 develops a discussion around our findings and finally, our main conclusions and future debates are exposed in Section 6.

4.1 INTRODUCTION

Sustainable investment has experienced strong growth in the last years as a result of the pressure of decreasing commissions, increasing flow of funds towards passive investment, and strong social and regulatory support such as the Paris Treaty at COP 2021 and the Sustainable Development Goals (SDG) set by the United Nations in 2015. This growth has raised doubts among academics and practitioners about potential cases of Greenwashing where green credentials of funds are exaggerated. Fund management companies are increasingly repurposing funds or "greening" them by introducing changes in the name to include the words "sustainable", "ESG", "green" and "impact" (Ghoul & Karoui, 2020). Academics have found mixed results with some papers observing potential greenwashing in the fund industry (Gangi & Varrone, 2018; Gibson et al., 2020; Kim & Yoon, 2020; Leite & Céu Cortez, 2014; Liang et al., 2021; Utz & Wimmer, 2014) while others observed that SRI funds were true to their nature (Alda, 2020; Benson et al., 2006; Joliet & Titova, 2018; Kempf & Osthoff, 2008; Nitsche & Schröder, 2018).

Investors may not be able to discriminate between the greenwashers and genuine ESG investors (Liang et al., 2021) due to the lack of harmonized ESG disclosure regulation that creates distortions (Muñoz et al., 2021) and the costs associated with sustainability assessment (Darnall et al., 2018). Investors complain about the lack of comparable and verifiable information that results in the use of time and effort to detect greenwashers, especially among passive funds. Andersson et al., (2016) highlight that few investors are conscious of the carbon footprint of their portfolios and the possibility that they may be holding stranded assets. The awareness may be linked to the type of investor. Institutional investors realize that climate risks have financial implications and regulatory risks (Krueger et al., 2020), they are more active in their monitoring role than retail investors (He et al., 2019) and higher institutional ownership with a long-term horizon has been associated with higher CSR (Boubaker et al., 2017). Paetzold et al., (2015) observed that some respondents believed that financial advisors were withholding sustainability-related information required from the clients.

To support further growth of Sustainable Finance, regulation should tackle these issues. In the last years, we have seen an increase in mandatory reporting disclosure related to ESG in many

jurisdictions (Christensen et al., 2021) where at least twenty-nine countries have imposed ESG mandatory regulation disclosures on firms (Krueger et al., 2021). Mandatory ESG disclosure has been associated with improved accurateness of analysts' forecasts and reduced dispersion (Krueger et al., 2021) and has led to a higher prevalence of sustainable investing (Aghamolla & An 2021). Scholars argue that refinement in the regulatory system will decrease greenwashing (Gatti et al., 2019; Seele & Gatti, 2017) and that governments could play a central role in introducing legislation to oblige businesses to be more responsible (Scheyvens et al., 2016).

EU has been a driver and leader in terms of Sustainability linked regulation. After the adoption of the 2015 Paris Climate agreement, the EU announced its Action Plan "Financing Sustainable Growth". Part of the plan had a focus to reorient capital flows toward sustainable investments and increasing transparency and disclosure in the sector. The EU recognizes the absence of harmonized rules on disclosure, and the existence of diverging measures that could create fragmentation. With that objective, the EU published on November 27, 2019, the regulation 2019/2088 on sustainability-related disclosure in the financial services (known as SFDR) that was effective as of March 10, 2021. The SFDR addresses these last issues by increasing disclosure for financial fund market participants. The objective is to reduce information asymmetries because investors are relying heavily on unregulated information which may be an inadequate source for evaluation (Schaefer et al., 2015). Finance is based on the correct reward related to the risk of the instrument, and sustainability information helps investors achieve better risk-adjusted returns (Hartzmark & Sussman, 2019; Soler-Domínguez et al., 2020).

SFDR will require financial market participants and advisers to follow mandatory disclosures on the integration of sustainability risks and the consideration of adverse sustainability impacts (PAIs) and make disclosures measurable and comparable (Folqué et al., 2021). Furthermore, at a product level fund managers must disclose in the pre-contractual and periodical reports the categorization of their funds into three categories: funds with environmental or social characteristics (Article 8 also called "light green"), funds with sustainable investment objectives (Article 9 or also called "dark green") and funds that do not meet the requirements of previous which imply they do not integrate or if so in small degree sustainability into their investment process (Article 6). These labels can help investors to reduce information and research costs linked to SRI fund investing (Gutsche

& Zwergel, 2020). SFDR has been a landmark in SRI fund regulation as it increases transparency and makes funds self-declare their commitment to Sustainability.

There is a growing volume of academic papers that study the link between ESG disclosure and firm performance (Huang, 2021); however, there is a research gap as the link between mandatory ESG disclosure regulation and ESG score performance of funds is still not well developed. Our research questions address this gap by investigating if SFDR has functioned as a driving force. The goal of this chapter is to test if regulatory pressure has promoted a stronger commitment of the market influencing ESG scores of funds. The study will help us see if SFDR has motivated market change due to increased awareness of the topic. We hypothesize that the passage of the SFDR regulation may have pressured and incentivized portfolio managers not only of self-labeled Socially Responsible Investment Funds (SRIF) but also of Conventional funds (CF) from the same Fund Management companies. To test this hypothesis, following (Belghitar et al., 2017) we perform a matched pair approach of SRIF vs Conventional Funds (CF) from the same fund Management Firm using SFDR publication as a natural experiment to analyze the effects of this intervention. As pointed out by Amir & Serafeim, (2018), sustainability regulation and interpretation of ESG as part of fiduciary duty are different depending on the region. Thus, we would test if there were any significant geographical differences in the results depending on the area of investment of the funds.

This study contributes to the literature in various ways. Firstly, to the best of our knowledge, there is a lack of papers that analyze the impact of the SFDR mandatory regulation as a driving force on the ESG scores of the fund market using the same fund management matched pair approach. Secondly, given the importance of the headquarters and that this regulation is European, we use a multiregional approach to address potential "spill-over" effects, so our results will contribute to theorizing on the impact of mandatory ESG disclosure regulation in a global fund investment market.

4.2 LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

4.2.1 Prior literature

Due to the recent publication of the SFDR, there is scarce direct literature on the topic. In this section, we discuss the potential effects of the most recent Sustainability Reporting mandates. We divide our analysis into two groups: 1) studies that observe the link between CSR disclosure regulation and stock performance and 2) Sustainability disclosure as a driver of change in behavior and impact on stakeholders.

Academics have analyzed the impact of the different new ESG regulations on the performance of best-behavior CSR firms or on high ESG portfolios to observe if they had been rewarded by the stock market. The Directive 2014/95/EU also known as the non-mandatory financial disclosure regulation (NFDR) published in 2004 was seen as a policy to legitimize non-financial information to improve comparability and accountability (la Torre et al., 2018). Grewal et al., (2019) used this event and observed a less negative and even positive return for the firms which had a stronger CSR score and higher CSR disclosure before the entry force of the directive. Santamaria et al., (2021) evaluated the impact of this regulation on the ESG scores of 31 Italian publicly quoted companies and observed an increase in their scores. This European directive is a close reference to the SFDR as the regulation was mandatory and affected all EU. The main difference is the universe affected as NFDR affected corporates vs SFDR which affects funds and fund management companies. Zhang et al., (2021) studied the impact before and after the 2016 "Guidelines for Establishing a Green" Financial System in China. The policy had a signaling effect for firms with high ESG that enjoyed lower financial costs and high ESG portfolios had a higher abnormal return after the announcement.

A different perspective of academic studies is to observe if sustainability disclosure has worked as a driver for change in the sectors or markets in which it was introduced. Méssonnier and Nguyen, (2021) studied the impact of 2006 the new French mandatory regulation that required only institutional investors to disclose their climate-related exposure. They observed that these new disclosure requirements reduced financing to fossil fuel energies by 40% vs the control group and

thus became a driver for the whole industry. Jouvenot & Krueger, (2019), studied the UK law that mandated publicly-listed first to disclose in a standardized way their greenhouse emissions and found evidence of firms reducing their emissions as a response to the new regulation. Tomar (2021), observed a similar effect in GHG emissions reductions in the USA in 2010 as a reaction to mandatory reporting of GHG for manufacturing facilities. Chen et al., (2018) found that mandatory CSR disclosure generated positive externalities for stakeholders (lower S02 emissions and industrial wastewater), however at expense of lower profitability for shareholders. Similarly, Aghamolla & An, (2021) observed that mandating ESG disclosure could result in overinvestment in sustainable technology even though it was less preferred from a shareholder perspective. Ioannou & Serafeim (2014) analyzed the implication of mandatory ESG regulation in China, Denmark, Malaysia, and South Africa using differences-in-differences and observed improved disclosure credibility and comparability in the treated sample.

Becker et al., (2021), up to our knowledge is the only paper that directly addresses the impact on funds ESG scores of SFDR regulation. The authors use a difference-in-differences methodology to compare EU funds vs US-based mutual funds using a 1:1 nearest neighbor to see if the global universe of European funds experienced an increase in their ESG score. Their results showed an increase in ESG score and fund net inflows for the EU fund group after the policy announcement vs the USA.

4.2.2 Hypothesis development

The growing awareness of the investors combined with regulatory support has increased the number of ESG data disclosure by companies and investors. Several theoretical frameworks have been applied to analyze the response of organizations to expectations and interaction with different groups (Deegan & Blomquist, 2006). It is not the intention of this chapter to review them in detail but to analyze how they have been used to interpret what drives corporations to disclose non-financial (ESG) information and how some of these theories link to the development of our hypotheses. As pointed out by Fernando & Lawrence (2014), it's inadequate to use a single theory to understand the behavior of organizations in relation to CSR.

The literature suggests that ESG Corporates may be pressured to live to the expectation that their actions are appropriate within societal forms to obtain legitimacy (Suchman, 1995). In this context, corporations could be using environmental disclosure as a way of legitimatizing their actions (Guthrie and Parker 1989). Voluntary CSR disclosure may be used as a proactive tactic to maintain legitimacy, as a way of manipulating society so scrutiny will relax and be satisfied by symbolic environmental actions (Mobus, 2005). Jiang et al., (2022) found evidence from 2012-2015 of a sample of S&P 500 that companies were using carbon emissions disclosure as a legitimizing tool, specifically in high carbon intensity sectors. Therefore, companies' motivations for disclosing ESG information may not be straightforward. Certain corporations may use public disclosure to reduce social pressure in case of failure to comply with the "social contract" (Tamimi & Sebastianelli, 2017) as the case of controversial industries which dedicated a higher ratio of their reports to social and community than environmental trying to legitimate their operations (Byrd et al., 2017). Grougiou et al., (2016) observed that "sin industries" are more likely to publish a CSR report and according to Zhang (2022) companies with financial constraints could also be motivated to disclose selective ESG information.

The EU directive 2014/95 of non-financial information (NFRD) has provided credibility and material legitimacy to corporate non-financial disclosure (Mazzotta et al., 2020). The application of legitimacy theory to the SFDR regulation could improve the legitimacy of funds after the concerns raised by practitioners and the financial press. Furthermore, SFDR will increase the perception of accountability for fund managers which can become a driver for SRI (Jansson & Biel, 2011). Given the evidence from the literature and the link between ESG disclosure and legitimacy theory, we want to test the spillover effect of the SFDR regulation over the whole sector.

Therefore, we wish to contribute to the growing debate about the impact of mandatory ESG disclosure regulation by testing the following hypothesis:

Hypothesis 1: All portfolios, including the non "self-declared or published" SRI funds, have experienced an increase in their ESG scores as a result of the pressure of the SFDR mandatory regulation.

Voluntary ESG disclosure may be used by corporations to signal future financial prospects of the firm and "good news" (Rezaee, 2016) which relates to the signaling theory (Grinblatt & Hwang, 1989). Companies with superior ESG performance may have a higher incentive to engage in voluntary disclosure (Dainelli et al., 2013) as there may be an association between CSR investments and future firm performance (Lys et al., 2015) and to signal their sustainability achievements as good corporate citizens through their sustainability reports (Christensen et al., 2021). Certifications can increase the credibility of product claims, build trust, and reduce information asymmetry (Erdem & Swait, 1998). Time continuity to CSR could also be interpreted as a signal of a sound commitment (Rivera et al., 2017).

The signaling theory may present a solid framework for interpreting the disclosure of ESG for funds. SRI Funds have a commitment to the clients through the investment mandate (Dolvin et al., 2019), and failing to meet it could become a matter of agency conflict (Gangi & Varrone, 2018). Folqué et al. (2021) found evidence that funds with more advanced sustainable investment strategies exhibit lower ESG risk. We expect that the self-labeled SRI group may have felt the pressure of the market and the disclosure of the regulation that could have incentivized them to a stricter commitment to sustainability. The SFDR regulation articles could become a label and a signaling tool for the commitment of SRI funds to transparency (Ioannou & Serafeim, 2014) in a market that has been occasionally associated with greenwashing and mis-selling.

We thus hypothesize:

Hypothesis 2: The "self-declared or published" SRI funds, have experienced a higher increase in their ESG scores than their conventional counterparts.

The literature has identified that institutional and geographical contexts can become determinants for sustainability disclosure. Organizations respond to pressure from their institutional environments (DiMaggio, 1988). Institutional theory views organizations as operating within a framework that has assumptions about what constitutes appropriate behavior and that influence their structure and practices (Carpenter & Feroz, 2001). The institutional theory can serve as a third framework for our research as institutional backgrounds from different countries can also

affect, accounting and CSR practices (Deegan, 2009), reliability of ESG disclosure (Yu et al., 2020), and ESG performance (Ortas et al., 2015).

The perception of Sustainability and fiduciary duty is perceived differently depending on the region. Amir & Serafeim, (2018), points us that a bigger percentage of US investors believe that ESG information is not relevant than European investors. Code law countries have shown a higher commitment to CSR as part of stakeholder commitment vs common law countries like the USA (de Villiers & Marques, 2016) and show a higher adoption of mandatory ESG regulation (Krueger et al., 2021). Higher levels of CSR disclosure could be related to countries with higher regulation and investor protection where managers are required to show greater conformity with social norms (de Villiers & Marques, 2016) or countries with a stronger environmental agenda (Glennie & Lodhia, 2013).

Accordingly, this leads to our Hypothesis 3, where we expect fund management companies with headquarters in the EU to have felt more strongly the pressure of the SFDR Regulation.

Hypothesis 3: The portfolios of the "self-declared or published" SRI funds with headquarters in the EU have experienced a stronger relative increase in their ESG scores as a result of SFDR regulation.

4.3 DATA AND METHODOLOGY

4.3.1 Data Collection

The choice of the funds is based on self-labeled funds as SRI where their fund name includes terms such as ESG, SRI, Sustainable, Social, Ethic, green, clean, carbon, climate, responsibility, sustainability, or Ethical (related to the approach used by Takahashi & Yamada, 2021). These self-labeled SRI funds voluntarily show their commitment (Dolvin et al., 2019). Within the investment universe, we focus on active (vs passive) equity (vs fixed income or alternative asset classes) as this specific group represents the biggest part of the fund investment. We use the fund management tools offered on the Website of Morningstar for our selection.

Once we arrive at a selection of SRI "self-labeled" funds we match them using a matched pair approach introduced by Mallin & Saadouni (1995). Our matching starts with funds from the same Fund Management Company as studies have shown it plays a major role (Belghitar et al., 2017). We use a 1 vs 1 approach and the following matching criteria: same management Fund company, geographical area of investment, investment size, and style according to the 9-grid box from Morningstar, and finally, fund age and size. We do not use the most recent proposed matching approaches of propensity score matching (Alda, 2018; Ammann et al., 2019; Bilbao-Terol et al., 2017; Day et al., 2016; Ghoul & Karoui, 2020; Joliet & Titova, 2018) as our analysis focus on differences in funds by the agents (fund management co) reacting to the categorization proposed by the SFDR. We arrive at a sample of 71 matched pairs of funds (a total of 142 funds) of which 56 funds are categorized as article 8 (39.4% of total) and 12 funds are categorized as article 9 (8.5% of total). The rest are categorized as article 6 (25 funds – 17.6% of total) or 49 funds (34.5% of total) are not categorized because they are based on areas that did not require categorization.

ESG fund scores transmit information on sustainability performance to investors. There is evidence that investors value positively sustainability with causal evidence that demand for funds is affected by sustainability ratings (Hartzmark & Sussman, 2019). We use different sources for the ESG scores as we have seen a strong debate around the divergence of ESG rating agencies (Berg et al., 2019, 2020; Dimson et al., 2020). ESG scores are low-frequency observation data points and contain a higher degree of qualitative data. In our data collection, ESG scores from Morningstar are published on the same date on the website. Whereas Refinitiv Eikon presents a different frequency of publishing ESG fund scores depending on the availability of information from Fund Management companies that make public their portfolios and when information is received from the database. Therefore, we use Morningstar as a reference and for the Eikon database, we allow for a +/- 2-month difference vs that data point. The information for ESG scores is sent and aggregated to the databases so its publication presents a 2-3 month lag We obtain 3 data points for the ESG scores: the first data for portfolio scores is from October 2020 (approximately 6 months before the entry into force of the SFDR), the second point is June 2021 (approximately 3 months after the entry into force of SFDR which was published we obtain from Morningstar on August)

and our last data point is October 2021 (6 months after the entry in to force SFDR and 1 year later from our first data point).

4.3.2 Description of variables and Methodology (Linear Regression Model)

This study estimates the linear regression model shown in Equation 1 with the aim of testing the above-mentioned hypotheses. This study uses panel data methodology with the aim of addressing the existence of latent unobservable effects specific to each fund. In particular, this study has applied the generalized least square (GLS) random effect (RE) technique. Additionally, the potential problem of multicollinearity has been explored by means of the variance inflation factors (VIF). The VIF values are below 10, therefore, multicollinearity is not a concern (Allison, 2012; Ferrero-Ferrero et al., 2016).

$$\begin{aligned} ESG_{i,t} = {} & \beta_0 + \beta_1 \cdot SELF\ SRI_{i,t} + \beta_2 \cdot POST_t + \beta_3 \cdot EU\ HEADQUARTER_{i,t} + \beta_4 \cdot \\ & SELF\ SRI_{i,t} \cdot POST_t + \beta_5 \cdot EU\ HEADQUARTER_{i,t} \cdot POST_t + \beta_6 \cdot SELF\ SRI_{i,t} \cdot \\ & EU\ HEADQUARTER_{i,t} \cdot POST_t \\ & + \beta_7\ Growth\ Style_{i,t} + \beta_8 \cdot Value\ Style_{i,t} + \beta_9 \cdot Mid\ Size_{i,t} + \\ & + \beta_{10} \cdot financial\ performance_{i,t} + \beta_{11} \cdot Size_{i,t} + \varepsilon_{i,t} \end{aligned} \quad \text{(Eq. 4.1)}$$

The variables included in Equation 4.1 are consistent with previous research (Becker et al., 2021). The dependent variable of this study describes the Sustainability rating or ESG score of the fund i at time frame t. For the ESG score as mentioned before we use two providers of information. ESG performance Refinitiv Eikon score which is the higher the score the better (used by Gangi & Varrone, 2018; Nitsche & Schröder, 2018). Sustainability risk from Morningstar is based on Sustainalytics data and for this score the lower the better as it is measuring risk (used by Alda, 2020; Becker et al., 2021; Joliet & Titova, 2018; Kim & Yoon, 2020; Nitsche & Schröder, 2018).

The independent variable is SELF SRI which is a dummy variable that takes the value 1 if the fund is self-labeled as ESG. The variable POST used to test the first hypothesis is a dummy variable which will be 1 if the information is after the entry in force of the SFDR regulation (March 2021)

and 0 if it is before the entry in force of the SFDR. To test the second hypothesis, we use the dummy variable SELF SRI POST which equals 1 if the fund i is a self-labeled SRI fund and for data points after the entry in force of the SFDR. To test the third hypothesis of geographical differences, we include the dummy variable EU HEADQUARTER which equals 1 if the fund i has headquarters in the EU and therefore is affected by the SFDR legislation.

The study includes as control variables: investment style (Growth Style and Value Style are included; Blend Style is the dummy variable omitted), investment size (Mid-Size is included, Large Size is the dummy variable omitted), the performance variable measures 1-year performance, and Size, measured as log of total net assets of a given fund i under the management of the fund at point t. The data for the control variables are obtained for all funds on the same dates for the 3-time frames using the Refinitiv Eikon Database.

4.4 RESULTS

Table 4.1 displays the descriptive statistics of the variables included in the empirical analyses. The average ESG performance (sustainability risk) of funds is 68.3310 (21.1869). The environmental pillar has the lowest contribution to the combined Sustainability risk. Governance is the pillar that shows the lowest dispersion (standard deviation) in both approaches which could be related to the higher consensus on governance measurements as a consequence of regulatory standards that resulted from the financial crisis (Gibson et al., 2020).

TABLE 4.1 Descriptive statistics

	Obs.	**Mean**	**S.D.**	**25th P.**	**50th P.**	**75th P.**	**Skw.**	**Kurt.**
SUS_RISK	421	21.1869	2.0310	19.79	21.08	22.45	0.4209	3.0139
ENVI_RISK	421	3.8364	0.8467	3.28	3.75	4.3	0.7571	4.2031
SO_RISK	421	8.9311	0.9991	8.32	8.96	9.62	-0.2895	3.4293
CG_RISK	421	7.3225	0.7765	6.87	7.22	7.72	0.4818	3.9177
ESG_PERFORM.	369	68.3310	6.6329	64.3873	68.8360	72.8615	-0.7268	4.2007
ENVI_PERFORM.	369	64.7537	9.0183	58.9850	65.5673	70.6177	-0.6095	3.5524

SO_PERFORM.	369	72.8063	7.2084	68.3407	72.9508	77.9117	-0.6859	3.9594
CG_PERFORM.	369	64.5321	5.2157	61.6566	65.0913	68.0206	-1.0329	6.7371
SELF SRI	426	0.5	0.5006	0	0.5	1	0	1
POST	426	0.6667	0.4720	0	1	1	-0.7071	1.5
EUHEAD	426	0.4085	0.4921	0	0	1	0.3725	1.1388
GROWTH STYLE	426	0.3099	0.4629	0	0	1	0.8223	1.6766
VALUE STYLE	426	0.1338	0.3408	0	0	0	2.1513	5.6282
MID SIZE	426	0.0352	0.1845	0	0	0	5.0435	26.4365
FINANCIAL_PERF.	364	3.7364	8.9353	0.1032	0.2035	1.9327	2.3076	9.8846
SIZE	368	16.4537	2.9439	15.3598	17.0223	18.3572	-1.1652	4.5522

Note: The table shows descriptive statistics (mean, standard deviation, percentiles, skewness, and kurtosis)

Tables 4.2 and 4.3 present the results of the regression analysis. Focusing on hypothesis 1, the results find evidence to support it and reveal a clear reduction of ESG risk (an increase in ESG performance) after the entry into force of the SFDR regulation for all the samples analyzed and for the three dimensions of the ESG. We could argue that SFDR may have worked as a driver for the fund industry as a whole.

Focusing on hypothesis 2, the results show that, in aggregated terms for all the periods studied, the SELF SRI funds have a lower sustainability risk (higher sustainability performance). Contrary to our initial expectations, after the entry into force of the SFDR regulation, the "self-declared" SRI funds affect with lower intensity the sustainability risk (performance) than the conventional funds. The decrease in scores of SELF SRI POST funds (after the entry of force of the SFDR) could be interpreted as conventional funds experiencing a relative decrease in their ESG risk (increase in their ESG performance scores). The SFDR legislation may have increased awareness of ESG risks and affected the rest of the funds. Jouvenot & Krueger, (2019), observed a similar effect where firms that were higher emitters due to additional transparency coming from the disclosure regulation pushed managers to reduce GHG emissions. We could argue that "self-labeled" SRI funds improved their ESG scores (reduced their ESG risk) since our first data point (October 2020) reacting ahead of the entry into force of the SFDR and as a reaction to the announcement and then relaxed (decrease of ESG scores POST-SFDR) while conventional funds

in the same company have benefited from this increased awareness and implementation of new internal procedures that are required by Fund Management companies to be able to comply with the requirements. Becker et al., (2021) pointed out, that the fund managers had since 2019 time to adjust and increase the ESG alignment of their portfolios.

Considering the relationship of EU headquarters, this study observes again that on aggregated terms funds with EU headquarters show a lower sustainability risk score (higher sustainability performance) than their counterparts. Concerning our third hypothesis, we do not find that "self-declared" SRI funds with headquarters in the EU experience a stronger increase in their ESG scores post-SFDR, in terms of risk. Nonetheless, in terms of ESG performance, this study has found slight evidence regarding a positive effect on ESG score after the SFDR of those funds from the EU and "self-declared" SRI funds. This means that Hypothesis 3 is supported in terms of ESG performance.

TABLE 4.2 Regression results – Sustainability Risk – MORNINGSTAR

Explanatory variables	SUSTAINABILITY RISK	ENVIRONMENTAL RISK	SOCIAL RISK	CORPORATE GOVERNANCE RISK
SELF SRI	-1.4786***	-0.4473***	-0.8026***	-0.4323***
	(0.3288)	(0.1457)	(0.1589)	(0.1356)
POST	-2.069***	-0.3610***	-0.7933***	-0.5386***
	(0.1615)	(0.0837)	(0.0969)	(0.0672)
EUHEAD	-0.6355*	-0.0153	-0.1140	-0.0955
	(0.3446)	(0.1529)	(0.1668)	(0.1421)
SELF SRI*POST	0.3300*	0.2402**	0.2038*	0.1221
	(0.1908)	(0.0985)	(0.1138)	(0.0794)
EUHEAD*POST	0.1474	0.1642	-0.0093	-0.0195
	(0.2245)	(0.1158)	(0.1338)	(0.0933)
SELF SRI*EUHEAD*POST	-0.3160	-0.1932	-0.0208	-0.1063
	(0.2903)	(0.1482)	(0.1702)	(0.1207)
GROWTH STYLE	-0.3789	-0.4513***	-0.4623***	-0.2186
	(0.3520)	(0.1531)	(0.1654)	(0.1450)
VALUE STYLE	0.6038	0.6130***	0.1939	0.1053
	(0.4751)	(0.2067)	(0.2234)	(0.1957)
MID SIZE	0.0364	1.0310**	-0.8176*	-0.9955**
	(1.0175)	(0.4423)	(0.4779)	(0.4191)
FINANCIAL PERFORMANCE	-0.0132**	-0.0057*	0.0024	-0.0046*
	(0.0062)	(0.0032)	(0.0037)	(0.0026)
SIZE	-0.0113	-0.0042	0.0148	-0.0086
	(0.0414)	(0.0193)	(0.0213)	(0.0171)
CONSTANT	23.8030***	4.3852***	9.7364***	8.1869***
	(0.7819)	(0.3617)	(0.3992)	(0.3233)
R^2 overall	0.3167	0.2627	0.3133	0.1987
WALD χ2-statistic	613.57***	66.42***	301.55***	259.70***
N. obs.	317	317	317	317

Note: The table presents the results of the regression with the estimation of the data provided from MORNINGSTAR.

Standard errors are in brackets. Statistically significant at 1% (***), 5% (**) and 10% (*).

TABLE 4.3 Regression results – ESG performance –THOMSON REUTERS – EIKON

Explanatory variables	ESG PERFORMANCE	ENVIRONMEN PERFORMANCE	SOCIAL PERFORMANCE	CORPORATE GOVERNANCE PERFORMANCE
SELF SRI	3.6914*** (1.1270)	4.9651*** (1.5391)	3.8167*** (1.2970)	1.8573** (0.8377)
POST	3.1463*** (0.6051)	3.8134*** (0.8483)	3.1423*** (0.6879)	1.4374** (0.7289)
EUHEAD	2.5433 ** (1.1991)	3.6317** (1.6375)	2.6842* (1.3800)	1.4527 (0.8939)
SELF SRI*POST	-2.8608*** (0.7130)	-4.2438*** (0.9993)	-2.6366*** (0.8107)	-1.9365** (0.8522)
EUHEAD*POST	-0.6576 (0.8061)	-1.6060 (1.1298)	-0.5794 (0.9166)	0.7024 (0.9621)
SELF SRI*EUHEAD*POST	1.8971* (1.0521)	3.5454** (1.4727)	2.2753* (1.1968)	1.0064 (1.2078)
GROWTH STYLE	-4.9985*** (1.2048)	-6.7898*** (1.6428)	-5.2590*** (1.3875)	-3.3387*** (0.8523)
VALUE STYLE	1.7996 (1.7933)	2.8813 (2.4456)	1.8096 (2.0653)	0.6540 (1.2710)
MID SIZE	-2.2346 (3.7426)	-2.9274 (5.0986)	-3.8035 (4.3121)	-0.2887 (2.5657)
FINANCIAL PERFORMANCE	-0.0475** (0.0211)	-0.0890** (0.0296)	-0.0650*** (0.0240)	-0.0330 (0.0247)
SIZE	0.1450 (0.1374)	0.1980 (0.1899)	0.0954 (0.1573)	0.0907 (0.1180)
CONSTANT	64.2098*** (2.5352)	59.5592*** (3.4963)	69.4484*** (2.9041)	62.5374*** (2.1330)
R^2 overall	0.3346	0.3512	0.3105	0.3054
WALD $\chi 2$-statistic	160.75***	145.10***	155.15***	72.25***

N. obs.	189	189	189	189

Note: The table presents the results of the regression with the estimation from THOMSON REUTERS EIKON. Standard errors are in brackets. Statistically significant at 1% (***), 5% (**) and 10% (*).

4.5 DISCUSSION

Our results for hypothesis one, where we observed a reduction of the overall risk on ESG scores and increase in ESG performance after SFDR for all the market show that mandating ESG disclosure led to a greater prevalence of sustainable investing producing a positive spillover effect (Admati & Pfleiderer, 2000). New disclosure mandates not only result in information for investors and stakeholder but may influence real firm decisions and how the agents allocate resources (Kanodia & Sapra, 2016). A shift from voluntary to mandatory environmental information has been seen to result in greater ESG activity (Jouvenot & Krueger, 2019) and just the concern of future regulation can motivate a response (Tomar, 2021). Our results are consistent with Dario et al., (2021), that stated that ESG regulation will pressure companies with lower disclosure and will allow for a better comparability vs the best-practice firms.

In regards with our second hypothesis, contrary to our expectations we saw a relative best behavior of conventional funds. The movement towards ESG consideration could be driven by future growth opportunities as firms may adapt their behavior to respond to the new disclosures (Christensen et al., 2021). We could argue that the regulation is acting as a driver for non-SRI funds. Conventional fund managers may have less incentive to deviate from market expectations as they are forced to additional disclosure (Grewal et al., 2019) and cannot hide poor ESG performance under lack of available information (Aghamolla & An, 2021).

In our sample conventional funds were matched from the same company; we observe conventional funds show a reduction of ESG risk vs the SRI funds. The SFDR reporting mandate includes disclosure requirements at firm level that may be also pushing their

conventional funds. Fund sale distributing platforms are shifting towards sustainability because of investment constraints from institutional investors (Hartzmark & Sussman, 2019). The markets are reflecting already this new trend. According to Morningstar 2021 review, only 25.2% of total number of European funds are article 8 and 3.4% are article 9 while the launches of new funds in EU in the fourth quarter of 2021 categorized as article 8 or 9 represented 54% of the total. Jouvenot & Krueger (2019) observed that the prospect of lower intuitional ownership served as an incentive to reduce GHG emissions. Furthermore, self labelled SRI funds may have reacted in anticipation as the SFDR was published in November 2019 but the entry in force happened on March 2021 and our first data point is October 2020. Reid & Toffel, (2009), found evidence that firms react to the threat of new regulation.

We found slight evidence of a positive effect on ESG score after the SFDR of those funds from the EU and "self-declared" SRI funds. Thus, we observed an influence of the institutional context of the headquarters of the Fund Management company. These results would be in line with Jouvenot & Krueger (2019) that observed that mandatory disclosure regulation pushed managers and resulted in a higher reduction of GHG emissions by UK affected companies' vs the European control group. This regulation was mandatory, prescriptive, and standardized and by increasing transparency gave managers a lower incentive to deviate from a greener standard.

4.6 CONCLUSION

We have seen that with the growth of sustainable funds, concerns about lack of disclosure, transparency, and potential cases of greenwashing have increased. There has been some talk about mis-selling of funds with ESG labels that did not correspond. The EU has decided to tackle this issue with the SFDR legislation that requires mandatory disclosure of principal adverse impacts and categorization of funds. The SFDR wishes to legitimize the use of these labels. In our study we addressed the effect that a mandatory ESG disclosure regulation (SFDR) had in

ESG investment behavior of fund managers. In particular, we examine a sample of 71 matched pairs from the same fund management company. Our study highlights, that SFDR has worked as a driving force for sustainable development in the funds market as the results show a clear reduction of ESG risk. SRI funds may have anticipated the effect of SFDR since the time of the announcement of the legislation and we have seen a spill-over effect of the regulation to conventional funds which experience better relative performance on their ESG scores after the entry of force of SFDR regulation. Our findings should be of interest to regulators considering mandatory regulations around ESG and show regulation consequences (Leuz & Wysocki, 2016).

Several limitations apply to our results. First, as we describe the same fund management company matching approach affects our final sample size. However, we believe the approach is justified for the purpose of the research and significance of the variable (Belghitar et al., 2017). Second of all, our results may be affected by the timing of the sample. COVID-19 has created a notable turbulence in the financial markets. As Christensen et al., (2021) points out, new regulation does not occur in a vacuum and results of event studies may be affected by confounding events and economy-wide shocks.

Our study is a first attempt to understand how SFDR may be a driver for change within the same fund management company. There are interesting new avenues of research. First, we could research the effect of SFDR in a more granular basis per country. Second, there is a need of research of how disclosure regulation may have affected fund flows of investors within the different categories of articles of the SFDR and if it may have resulted to new categorizations, repurposing of funds or new launches in the more sustainable categories to respond to the new transparency and awareness. Third, future empirical research could examine disclosures related with SFDR at a firm and fund level, analyzing it´s accessibility for investors (in the web, prospectus), comparability between different fund management companies, strategies, measures, and indices used to support fund categorization (SDG, EU taxonomy…), and usefulness for investors. This will allow to see how ESG disclosure standards drive changes within fund management firms' procedures and what becomes the future standards for the next generation of SRI funds.

A mandatory regulation will decrease greenwashing (Gatti et al., 2019; Seele & Gatti, 2017); however, for this move to work, we acknowledge the need for a harmonized global regulation as currently there is no standardized reporting framework where information is scalable and comparable (Christensen et al., 2021; Dario et al., 2021). Verification (del Giudice & Rigamonti, 2020) and labels will reduce information-related barriers (Gutsche & Zwergel, 2020) that will help maintain the trust and confidence of the investment community that may have been damaged by the concerns mentioned above. Standardized information will allow better comparability and benchmarking of funds and will push accountability of fund managers. However, as we have seen with climate risk disclosure it can be costly to create a new process and compile and interpret the information and this large cost will be less burdensome for large caps (Hail, and Leuz 2021) which could end up increasing the gap between large caps and small caps and geographical differences.

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Chapter 5: Conclusions

This thesis contributes to the SRI fund literature by realizing a systematic literature review on the topic of performance of SRI active equity funds and by providing empirical evidence on ESG score performance of self-declared SRI fund holdings and the effect of SFDR mandatory regulation. This concluding chapter will be structured as follows. In the first epigraph, we will summarize the main contribution of the research. Following, we will present the main limitations of the findings and future avenues of research linked to the topic. In the end, we will present a list of the conferences and publications linked to this Ph.D. dissertation.

5.1 CONTRIBUTIONS OF THE RESEARCH

This Ph.D. dissertation analyzes the growing field of research on SRI funds. The thesis mainly contributes by addressing the following research questions:

- Analyze if active equity SRI funds present a different relative performance from their conventional counterparts or from the indices (Conventional or SRI)

- Observe if ESG scores of self-labeled SRI funds present a better relative performance than their conventional counterparts

- Investigate if SFDR regulation has been a driver pushing ESG scores of self-labeled SRI funds and their conventional counterparts due to higher transparency and accountability.

Our systematic literature review presented in Chapter 2 contributes to the academic literature in two ways. Firstly, it presents for academics and practitioners a selection of comparable empirical studies broken into three subsamples that allows to extract conclusions. In the second place, our findings show that on average (67% of the studies) there is no difference or that the difference is not significant, Therefore, we propose to move forward the debate and our research from the

focus on the financial performance of SRI funds to other critical issues such as the true nature of SRI funds and the need for regulation.

In Chapter 3, we have performed a comparative analysis between SRI funds and Conventional Funds of the same Mutual Fund Company to test the consistency of SRI funds with their identity. Our findings show that "self-declared" SRI Funds with ESG consideration in their prospectus is a significant variable. This variable affects positively (negatively) the ESG performance score (sustainability risk) of the funds. When we analyze our results from a multi-regional perspective, we find evidence of regional differences. Our study contributes to the literature as it is up to our knowledge the first research to study these regional perspectives with same fund management companies. These differences can be explained due to the interpretation of the fiduciary duty of fund managers and the supporting ESG regulation that exists in the different regions.

Lastly, in chapter 4, we contribute to the literature by addressing the impact of SFDR mandatory regulation as a driving force on the ESG scores of the fund market using the same fund management matched pair approach. Furthermore, we contribute by analyzing the relevance of the headquarters as this was a European regulation. The results will be useful for theorizing on the impact on the financial sector of mandatory ESG disclosure regulation in different regions apart from the affected due to the globalization of financial institutions such as fund management companies.

5.2 LIMITATIONS AND FUTURE RESEARCH

The size of the sample is the main limitation of the research that affects our empirical analysis of chapters 3 and 4. The sample size is affected by our matching approach of using as the first matching criteria same fund company. However, we believe the approach is justified for the purpose of the research and the significance of the variable (Belghitar et al., 2017). Second of all, our results in relation to the impact of the SFDR regulation may be affected by the timing of the

sample. As part of our sample could be affected by the economic turbulence and the unprecedented global impact that COVID-19 has had on the financial markets.

In our research, we are using ESG scores as a proxy for ESG performance. However, academic research has pointed to divergence and lack of signaling power of ESG scores by agencies. Therefore, it would be useful to analyze if ESG scores of portfolio holdings are truly reflecting a true commitment and engagement of fund managers. Future research could move to study which ESG Scores are more relevant for fund managers and fund investors to evaluate true sustainability commitment.

In our systematic literature review, we observed that is complicated to achieve an absolute truth. Performance of SRI funds may be affected by other characteristics (such as the talent of managers, type of screen and intensity, investment management company specialization, regulation impact, geographic location, or management style) that could behind the differences. Therefore, we saw the opportunity of addressing the potential concerns of the true nature of SRI funds and their potential "greenwashing". Interesting avenues of research on this topic would include a deeper analysis and categorization of SRI funds depending on their ESG ratings, screening approach, and SFDR categorization.

As we have seen in Chapters 3 and 4, we perform a regional analysis to address potential differences in ESG regulation, interpretation, and concept of fiduciary duty. In the future, the research could benefit from a more granular analysis per country as the availability of information increases.

In relation to regulation and to SFDR, we see several research questions that could be addressed in the future. Using the categorization established by SFDR, the research could analyze the impact of fund flows of investors, repurposing of funds, or new launches of funds in article 8 and 9. Furthermore, SFDR regulation has resulted and will result in an increase in the disclosure of sustainability-related information. The EU has given some guidelines in this regard but there is some room for interpretation for fund management companies. Therefore, future empirical

research could study the disclosures related to SFDR at a firm and fund level, analyzing it is usefulness and accessibility for investors (in the web, prospectus) and it is success in offering a standardization in the sector. The success of this legislation could become a signal of confidence for investors due to the increased transparency and accountability that could result in a decrease on the concerns of greenwashing.

To conclude, this Ph.D. research offers a novel and interesting insights on SRI funds their performance, their true nature, and the impact of regulation. This dissertation arises new research questions that could be addressed by academics and that would be useful for the market practitioners. The sustainability challenges that we are facing, such as climate change, require joint action from the public and private sectors. Redirecting investments towards more sustainable companies through SRI funds can help achieve these goals. However, we need a true commitment from the fund management industry and supporting global regulations that will allow a more efficient use of resources, reduce information asymmetries, and promote accountability. The trust of investors is vital to move the sector into a more sustainable financial system that addresses not only shareholders needs but also includes in its vision all stakeholders.

5.3 PUBLICATIONS

The publications included in this dissertation have been published and presented in different media that we present in this section. The interactions during the conference have helped advance the research and have added further depth to the analysis.

One book chapter that was co-author (please see the authorization of co-authors attached in the annex):

- Martinez Meyers, S., Muñoz M.J, Ferrero, I.; (2022).“Is performance the key issue in SRI funds? Conclusions and lessons learned from three decades of study” Palgrave Contemporary Issues in Sustainable Finance – Session Performance

Two articles under review that were co-author (please see the authorization of co-authors attached in the annex):

- Martinez Meyers, S., Ferrero, I.; Muñoz M.J. (2022). "*SRI Funds and their true nature*".
- Martinez Meyers, S., Ferrero, I.; Muñoz M.J. (2022). "*European Sustainable Financial Disclosure Regulation (SFDR) as a driving force for improving ESG performance in the fund industry".*

Seven international conferences:

- Martinez Meyers, S., Ferrero, I.; Muñoz M.J (2021). "*: Are SRI funds consistent with their identity?".* Globally Sustainable Banking & Finance Conference. Queens University of Belfast, Northern Ireland, United Kingdom.
- Martinez Meyers, S., Muñoz M.J, Ferrero, I.; (2021). "*: Looking forward is performance really the issue in SRI funds?".* Globally Sustainable Banking & Finance Conference. Queens University of Belfast, Northern Ireland, United Kingdom.
- Martinez Meyers, S., Muñoz M.J, Ferrero, I.; (2021). "*: Is performance the key issue in SRI funds? Conclusions and lessons learned from three decades of studies".* Social Impact Investments International Conference 2021. Sapienza University of Rome. Rome, Italy.
- Martinez Meyers, S., Ferrero, I.; Muñoz M.J (2021). "*: SRI funds and their true nature: do SRI funds do the "talk" and the "walk"?".* Social Impact Investments International Conference. Sapienza University of Rome. Rome, Italy.
- Martinez Meyers, S., Ferrero, I.; Muñoz M.J. (2022). "*SRI Funds and their true nature*". Sustainable Accounting and Finance Conference: Data-Driven Investments. Sprott School of Business, Ottawa, Canada.

- Martinez Meyers, S., Ferrero, I.; Muñoz M.J. (2022). "*Regulation as a driving force in Sustainable Finance - the case of SFDR".* 39th EBES Conference. Sapienza University of Rome. Rome, Italy.

- Martinez Meyers, S., Ferrero, I.; Muñoz M.J. (2022). "*SRI Funds and their true nature*". ASFAAG- Academy of Sustainable Finance, Accounting, Accountability and Governance - .2nd Annual conference. Istanbul Medipol University, South Campus, Istanbul, Turkey

AUTHORIZATIONS:

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(Nombre)..Maria Jesus Muñoz Torres....., como coautor/ coautora doy mi **autorización** a (Nombre del doctorando/doctoranda) ..Susana Martinez Meyers...para la presentación de las siguientes publicaciones como parte de su tesis doctoral.

Relación de publicaciones:

Martinez Meyers, S., Muñoz M.J, Ferrero, I.; (2022)." Is performance the key issue in SRI funds? Conclusions and lessons learned from three decades of study Palgrave Contemporary Issues in Sustainable Finance – Session Performance

- Martinez Meyers, S., Ferrero, I.; Muñoz M.J. (2022). "SRI Funds and their true nature".
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