



Facultad de Ciencias Económicas y Empresariales

THE CONTRIBUTION OF THE ASSET MANAGEMENT INDUSTRY TO SUSTAINABLE DEVELOPMENT

Autor: María Folqué González- Valerio

Director: Dra. Doña María Teresa Corzo Santamaría

Dra. Doña Elena Escrig-Olmedo

Acknowledgements

First, I would like to express my most heartfelt gratitude to my thesis advisors Dr. María Teresa Corzo Santamaría of Universidad Pontificia de Comillas and Dr. Elena Escrig-Olmedo of Universitat Jaume I, for their continuous support of my Ph.D. study and related research. They both embody the best of the docent and research vocation with their dedication, availability, and vast knowledge. I am sincerely at a loss for words to thank them properly for their constant and enthusiastic encouragement, hard work, and limitless patience. They have made this learning adventure a unique experience.

I consider myself extremely fortunate to have counted on their support, advice, and relentless commitment. I definitely could not have imagined having better advisors and mentors for my Ph.D. study. How fantastic to have the chance to work together and to learn from you!

Special thanks to Dr. Carmen Valor, Dr. Antonio Rúa, Dr. Carmen Meneses, and Dr. Isabel Carrero for their teachings of academic research, the passion they put in them; and for their help, rigor, and example.

My sincere gratitude to Mr. Juan José de Barbáchano for his immense patience, availability, and kindness.

Also, I would like to thank all my Ph.D. teachers for their valuable guidance and my fellow doctoral students for their feedback, cooperation, and support.

I could not have embarked on this period of study and research without the help and encouragement of Gonzalo Fernandez Guadaño, my boss, CEO of FundsPeople.

My deep gratitude for granting me the resources, time, and peace of mind needed to advance this thesis. I would also like to acknowledge all my colleagues at FundsPeople for their gracious understanding and generous help.

To my friends, thank you, thank you, thank you for your tireless interest and unflinching support along the way. Though sometimes I have dreaded your questions about how the thesis is going, this would have been impossible without you.

To my family, especially my siblings Emilio and Cristina, my brother and sister-in-law, and all my nieces and nephews, I cannot thank you enough for your love, enthusiasm, and faith. I feel incredibly lucky to belong to a family that considers pursuing a Ph.D. something worthwhile and even cool. I love you.

And finally, my deepest gratitude to my late parents for their enduring example. I wish you were here, but I have felt sustained by your love all along the way. This thesis is dedicated to you in loving memory.

Contents

Introduction	1
1. Motivation and objective	1
2. Methodology	3
3. Outline and contents of the document	4

First Part: State of Art

Chapter One: Contribution of Sustainable Investment to Sustainable Development within the framework of the SDGs: The role of the Asset Management Industry.....

1.1. Introduction	7
1.2. Methodology of literature review	10
<i>1.2.1. Keywords and search</i>	11
<i>1.2.2. Codification</i>	13
1.3. Review findings and discussion	16
<i>1.3.1. Major research topics in sustainable investment</i>	16
<i>1.3.2. SDGs integration in the financial market</i>	18
<i>1.3.3. Key market actors for the integration of SDGs in the financial market</i>	20
<i>1.3.4. SI Strategies and their contribution to achieving the SDGs</i>	23
<i>1.3.5. Challenges a new paths</i>	25
1.4. Conclusion	28

Second part: Empirical Analysis

Chapter Two: Integration of Advanced SRI Practices into the European Asset Management Industry: A Survey of Drivers

2.1. Introduction	33
2.2 Theoretical Framework and Hypotheses	37

2.2.1. <i>Drivers of SRI</i>	37
2.2.2. <i>SRI strategies</i>	40
2.3. Methodology	44
2.3.1. <i>Sampling and Data Collection</i>	44
2.3.2. <i>Variable Description</i>	46
2.3.3. <i>Empirical Design</i>	48
2.4. Findings	49
2.5. Discussion and Concluding Remarks	54
Chapter Three: Sustainable development and Financial System: Integrating ESG risks through Sustainable Investment strategies in a climate change context	59
3.1. Introduction	59
3.2. Theoretical Framework and hypotheses formulation	62
3.2.1. <i>Sustainability risks and SI funds</i>	62
3.2.2. <i>Sustainability risks and SI strategies</i>	63
3.2.3. <i>Climate risk and financial sector</i>	66
3.3. Methodology	68
3.3.1. <i>Data Description</i>	68
3.3.2. <i>Variable Description</i>	71
3.3.3. <i>Statistical model.</i>	72
3.4. Results	73
3.4.1. <i>ESG risks: Analysis of mean differences between SI funds generations.</i>	73
3.4.2. <i>Carbon Risk: Analysis of mean differences between SI funds generations.</i>	75
3.5. Discussion	76
3.6. Conclusion	79

4. Conclusion, Contributions and Future Research	83
4.1. Contributions	83
4.2. Limitations and future research	86

References	89
-------------------------	----

Appendix	103
-----------------------	-----

List of Tables

CHAPTER ONE

Table 1. Keywords linked to the Research Questions	11
--	----

Table 2. Distribution of papers according to codification	14
---	----

CHAPTER TWO

Table 1. Profile of sample rates	46
--	----

Table 2. Definition of variables and descriptive statistics.....	47
--	----

Table 3. Test for H1: Advanced SRI Strategies.....	49
--	----

Table 4. Test for H4: Management of extra-financial risks.....	50
--	----

Table 5. Test for H3: Integration in the portfolio construction and measurement of ESG and other specific extra-financial risks.....	50
--	----

Table 6. Test for H4: Information frequency and public disclosure	51
---	----

Table 7. Test for H5: Engagement.....	52
---------------------------------------	----

Table 8: Hypotheses.....	54
--------------------------	----

CHAPTER THREE

Table 1. SI generations according to their strategies or aggregated strategies	70
--	----

Table 2. Number of funds by category and SI generation.....	70
---	----

Table 3. ESG attributes and Carbon Risk score by SI funds generations.....	71
--	----

Table 4. ANOVA to test the differences in means between SI funds generations in terms of ESG risk scores.	73
--	----

Table 5. POST HOC Tests. Multiple Comparisons.....	74
--	----

Table 6. ANOVA to test the differences in means between SI funds generations in terms of carbon risk scores.....	75
Table 7. POST HOC Tests. Multiple Comparisons.....	76
Table 8. Summary of statistically significant differences of means between SI funds generations.....	77

List of Figures

CHAPTER ONE

Figure 1. Process of the Systematic Literature Research	12
Figure 2. Categorization criteria	13
Figure 3. Distribution of publications per year	17
Figure 4. SDGs analyzed in the scientific literature focused on financial market since SDGs launch.....	20
Figure 5. Market actors analyzed in literature focused on the financial market since SDGs launch	20
Figure 6. Market actors and SDGs	22
Figure 7. SI strategies analyzed in the academic literature since SDGs launch	23
Figure 8. SI Strategies and SDGs	25
Figure 9. New challenges in the context of the SDGs for the financial market since SDGs launch	25
Figure 10: Current research findings and future research avenues.....	29

CHAPTER TWO

Figure 1: Contribution to SRI literature and practical implications.....	57
--	----

Introduction

This chapter contains a brief introduction to the research performed in this thesis. Firstly, the motivation for developing the research question and the main objective of this thesis is presented. In the next section, the methodology used to achieve the objective is included. Finally, the structure and contents explored in the following chapters are offered.

1. Motivation and objectives

Socially investment (SI) has become one of the most prominent topics for researchers, business community, financial markets and society in recent years. A growing number of investors are seeking to stimulate the economic recovery in a more sustainable way.

The management of investments and money according to ethical rules and social convictions is a practice with a long history. Its origins are associated with the ethical considerations of the Jewish, Christian, and Muslim traditions and their sacred texts. Later in the 17th century, Quaker communities refused to allow their financial activities to connect with alcohol production or the exploitation of slaves. In the 18th century, the founder of Methodism, John Wesley, stated in his sermon "The Use of Money" that no one should profit from exploiting other human beings (Renneboog et al., 2008).

In the asset management industry, the Pioneer Fund already screened investments based on religious prohibitions in 1928, but it was not until 1971 that what is considered the first modern SI fund, the PAX World Fund, was created in response to investors' demand to exclude from their portfolios US companies linked to the Vietnam War (Lozano, Albareda, & Balaguer, 2006). Another early SI fund, the Dreyfus Third Century Fund (1972), focused on avoiding sin stocks and improving labor standards (Sparks, 2002). Europe came later to SI, with the UK fund Friends Provident Stewardship Fund in 1984 (Junkus & Berry, 2015). In the 1980s, the rejection of "apartheid" in South Africa, as well as the environmental catastrophes of Chernobyl and Exxon Valdez, gave impetus to a trend that would crystallize in the 1990s with the popularization of funds that follow ESG (environmental, social, and good governance) criteria, giving rise to the current SI.

According to the Global Sustainable Investment Alliance (GSIA), sustainable investment (SI) is an investment approach that considers environmental, social, and governance (ESG) factors in portfolio selection and management (GSIA, 2020). Woods and Urwin (2010) also emphasise

that the SI approach requires active ownership and intergenerational awareness. Although SI was considered a minority trend for many years and its profitability was questioned, over the last two decades, SI has experienced impressive growth. At the start of 2020, global sustainable investment reached USD 35.3 trillion, a 15% increase in the past two years (2018-2020) and 55% increase in the past four years (2016-2020). Reported sustainable investment assets under management make up a total of 35.9% of total assets under management (GSIA, 2020).

Sustainable investment has experienced a solid new momentum following the Paris Agreements on climate change (COP 21, 2015) and the launch of the SDGs (UNDP, 2015). These two historical milestones have brought about a paradigm shift for investment in sustainable development and the deployment of strategies that could cope with the challenges posed by the fight against climate change and the 2030 Agenda.

The transition to a low carbon economy and the SDGs' framework demand the cooperation of the public and private sectors. The financial markets' role, specifically the asset management industry, is crucial to bridge the financing gap that the shift to a sustainable economy entails.

During an extended period, a large body of research has focused on comparing the financial performance of sustainable vs. conventional investments, almost to exhaustion, to conclude that there is insufficient empirical evidence to demonstrate a causal relationship between the introduction of sustainability criteria in a portfolio and a better or worse performance for the investor (Revelli and Viviani, 2015; Cunha et al., 2020)

This thesis aims to change the focus to a timely and urgent matter: *how sustainable investment can have a major and more effective impact on sustainable development.*

For this reason, this PhD dissertation intends to achieve this purpose focusing on the following research objectives:

- First, to understand how the mitigation of climate change and the 2030 Agenda are being incorporated into investment practices (See Chapter One);
- Second, to investigate which factors seem to be more decisive for asset managers in adopting more sophisticated and effective SI practices for the advancement of sustainable development (See Chapter Two); and
- Third, to know which SI investment strategies make a better contribution to sustainable development (See Chapter Three).

In line with GSIA and the practice, the term sustainable investment (SI) may be used interchangeably with responsible investment and socially responsible investment (SRI) in this document, whilst recognizing distinctions and regional variations in its meaning and use.

2. Methodology

The present research combines the use of qualitative (e.g. systematic literature research and self-administered survey) and quantitative (e.g. logistic regression model and parametric tests) analysis techniques.

In Chapter One, in order to identify how sustainable investment contributes to sustainable development since the launch of the SDGs and the Paris Agreements, a systematic literature research was conducted inspired by the systematic methodology proposed by Nawaz and Koç (2018). This systematic methodology presents the following steps: (i) identification of keywords, (ii) development of screening criteria, (iii) identification of search engines, (iv) execution of the search, (v) initial and (vi) final screening.

The search focuses on published articles in journals. Only articles in English were considered, and the analysis period ranges from 2015 to 2021. Concretely, 2015 starts the period analyzed since it was the year when SDGs were launched and the Paris Agreements reached. The studies were identified in two renowned indexed electronic databases: ISI Web of Science (WoS) and Scopus. Focusing on articles addressing SDGs and sustainable development, the final selection was limited to 49 articles subjected to full-text analysis. With the aim to answer the research questions and know the challenges that the sustainable finance market must face to integrate sustainability and respond to the SDGs, the data collected from the reviewed papers were classified and coded according to a set of categorization criteria for each research question.

In Chapter Two, a self-administered survey was designed to gather the information required to identify the main drivers for adopting advanced sustainable and responsible investment practices by asset management companies. The goal is to know why and which asset management companies better advance the strengthening of SI. The online self-administered survey was sent both to asset management companies that already manage and/or market mutual funds in Europe.

Once the data was gathered, a linear probability model, namely, the logistic regression model, was used to analyze the influence of different factors on the asset managing industry. This is a generalisation of the classic linear regression model for categorical dependent variables. Based

on the type of dependent variable analyzed in the study, multivariate binary logistic regression, used when the dependent variable has two categories, was run.

In Chapter Three, to analyze which SI strategies or combinations of them allow practitioners to better manage ESG risks in ESG portfolios within a complete framework consistent with global challenges, a parametric analysis of variance method was adopted.

This study analyzes equity funds registered for sale in Europe labeled by the Morningstar database as "socially conscious." The analysis focuses on four main equity categories: Europe Large Cap Equity, Global Large Cap Equity, US Large Mid Cap Equity, and Global Emerging Markets Equity. The portfolio information about ESG risks was obtained from Morningstar Direct. The analysis covers the period November 2018-September 2020 since previous data was not available due to a change of methodology in the Morningstar database. Once the funds were collected, they were classified into five generations, from the most basic to the most advanced SI generation.

To analyze the differences among SI funds generations, a parametric ANOVA method was adopted where the dependent variables are the ESG risk scores and the carbon risk score; and the factor is the SI fund generation. The ANOVA test allows us to examine the mean differences between the five different groups of equity funds. Given the assumptions on which the ANOVA test relies, the analysis followed these steps: First, a Kolmogorov–Smirnov test of normality was conducted; second, the homogeneity of variances based on the Levene statistic was tested. If there is homoscedasticity, the parametric ANOVA one way to test which group is the most different, was applied. If the differences among SI funds generations are statistically significant according to the F-statistic, the Bonferroni and Tahmane post hoc tests were performed to identify the differences between groups.

3. Outline and contents of the document

In order to address the previous objectives, and besides this introductory section, this thesis is structured in two parts.

The first part, which includes Chapter 1 titled "Contribution of Sustainable Investment to Sustainable Development within the framework of the SDGs: The role of the Asset Management Industry", is a State of Art section that aims to learn how the financial market, through sustainable investment, contributes to sustainable development, within the framework of the

Sustainable Development Goals, by defining advanced socially responsible investment practices under the new global challenges.

The second part is driven by empirical analysis and includes Chapter 2 and Chapter 3.

Chapter Two titled “Integration of Advanced SRI Practices into the European Asset Management Industry: A Survey of Drivers”, is devoted to investigating which factors seem to be more decisive in adopting more sophisticated SI practices by the asset management industry. Once reviewed the SI drivers explored by previous research, three main categories of drivers were identified:

- Business pressures: external pressures (societal pressures and market pressures) vs. internal pressures
- Business structure: ownership structure- independent vs. non-independent
- Business strategy: Formal CSR policy

The next step was to analyze which drivers could be more decisive in the asset management companies' decision to adopt advanced SI practices helping, in this way, to the achievement of the SDGs and the transition towards a low carbon economy. To that end, first, a self-administered survey was conducted among fund management companies that manage and/or distribute investment funds in Europe; and second, logistic and multivariate regressions were used as analytical tools for testing the research hypotheses.

Chapter Three titled “Sustainable development and Financial System: Integrating ESG risks through Sustainable Investment strategies in a climate change context”, focuses on the analysis of which SI strategies better advance sustainable development by achieving lower ESG and carbon risks. This thesis argues that if SI, despite its impressive growth, is not producing a relevant impact on sustainability indicators, it is partly due to the prevalent use of non-advanced SI strategies. A sample of sustainable equity funds is gathered and categorized according to their SI strategies, from the least to the most advanced generation. To analyze the differences among SI funds generations, we adopt a parametric analysis of variance method where the dependent variables are the ESG risk scores and the carbon risk score; and the factor is the SI fund generation.

Finally, this thesis presents the major conclusions, contributions and lines for future research, followed by references and appendices.

First Part: State of Art

Chapter One

CONTRIBUTION OF SUSTAINABLE INVESTMENT TO SUSTAINABLE DEVELOPMENT WITHIN THE FRAMEWORK OF THE SDGS: THE ROLE OF THE ASSET MANAGEMENT INDUSTRY

This chapter aims to learn how the financial market, through sustainable investment, contributes to sustainable development, within the framework of the Sustainable Development Goals, by defining advanced socially responsible investment practices under the new global challenges. To this end, the focus is placed on the asset management sector and fund managers as the main actors to integrate the Sustainable Development Goals in the financial market through their investment products. For this purpose, a systematic literature review comprised between the years 2015-2021 is carried out. This analysis advance beyond previous academic research and professional practice by providing insight into the asset management industry's challenges to contribute to sustainable development efficiently in the current context. This will allow defining the key lines of research to which this thesis will respond.

1.1. Introduction

The 17 Sustainable Development Goals (SDGs) within the 2030 Agenda for Sustainable Development of the United Nations Development Program (UNDP) and the Paris Agreement under the United Nations Framework Convention on Climate Change (UNFCCC) are two major global initiatives that have shifted the practice of sustainable investment.

The SDGs are 17 objectives and 169 targets, which constitute the reference framework for sustainability at the global level. The SDGs seek to eradicate poverty, reduce inequalities and fight climate change, achieving sustainable development. Meanwhile, the Paris Agreement (COP21) seeks to combat climate change and to accelerate and intensify the actions and investments necessary for a sustainable future with low carbon emissions.

The scope and magnitude of the environmental, social, and economic challenges of these initiatives aim to overcome demand a multilateral, multinational, and multistakeholder approach. According to the U.N. Commission on Trade and Development, meeting the SDGs

requires \$5 to \$7 trillion in annual investments through 2030 (UNCTAD, 2014), while the International Energy Agency calculates that maintaining the temperature threshold of the Paris Agreement will require \$53 trillion in investments by 2035 (IEA, 2014; Tolliver et al., 2019). Hence, the contribution of both the public and private sectors is needed in the fight against climate change and the achievement of SDGs (Scheyvens et al., 2016). Within the private sector, the financial sector plays a crucial role in the achievement of the SDGs. The financial sector can enhance the relevance of SDGs for all sectors adopting these goals as the reference for investing, advising or lending to companies (Betti et al., 2018). Through their control of a significant share of capital markets worldwide, institutional investors and the asset management industry can influence in different ways in their investee companies or issuers to align with SDGs (García Sánchez et al., 2018).

In this line, the Action Plan on Sustainable Finance of the European Commission (2018) seeks to foster the role of sustainable investment (SI), that is, the investment process that has a potentially positive impact on sustainable development through the integration of not only financial concerns but also long-term ESG criteria into investment decisions (Escrig-Olmedo et al., 2017). The three key objectives of the Action Plan are: *“(1) to reorient capital flows in order to achieve sustainable and inclusive growth; (2) to manage the financial risk stemming from climate change, environmental degradation and social issues; and (3) to foster transparency and long termism in financial and economic activity”* (EC, 2018; Janik & Maruszewska, 2018). Based on the Action Plan (2018) and other initiatives, the European Commission presented its “strategy for financing the transition to a sustainable economy” on July the 6th, 2021. The renewed strategy is based on four main areas and includes a package of six actions, among which it stands out the guarantee of the integrity of the financial system to become more resilient to the risks posed by climate change and environmental degradation. On April the 21st, 2021, the European Commission has already adopted an important package of sustainable finance measures such as the EU Taxonomy Climate Delegated Act and the Corporate Sustainability Reporting Directive (CSRD).

Despite institutional momentum and the growing demand for sustainable investment products that has led SI assets under management to USD 35.3 trillion in 2020, a growth of 15% in two years, equating to 36% of all professionally managed assets across the world (GSIA, 2020), many fear that this prevalence has not been reflected efficiently in sustainability achievements (Diener & Habisch, 2020).

Recently, a branch of academic literature has tried to explain this mismatch. Friede (2019) has carried out an extensive meta-synthesis of 112 studies to analyze environmental, social, and governance (ESG) factors integration impediments, identifying 161 topics subsumed in a four-pillar framework: market-, firm-, regulatory-, and individual-based impediments. Diener & Habisch (2020) attribute the limited sustainability achievements to the emphasis of financial aspects in SI theory and practice and propose a more equilibrated SI with a growing presence of non-financial information. From a different perspective, Mgbame (2021) defends a model of a quantitative monetization of ESG metrics into financial reporting. For Yoshino et al. (2021), the different SDG assessments institutional investors receive from consulting firms for asset allocation create major distortions. Moreover, the heterogeneity of concepts, definitions, and standards may hinder the SI markets with risks as green or sustainable washing or the rebranding of financial flows without additionality, according to Migliorelli (2021), who defends a change of terminology to “finance for sustainability”. Díez Cañamero et al. (2020) argue that one notorious flaw of the 2030 Agenda is its macro approach to monitor the development of SDGs, which makes the evaluation and measurement of real contribution very difficult for companies. In sum, while the SDGs offer the opportunity to guide the corporate and public efforts for sustainable development, there is a fear that companies may be using the SDG rhetoric to disguise business as usual (Hummel & Szekely, 2021).

Given this disconnection between the expansion of SI and sustainability achievements, this thesis aims to deepen the understanding of how SI can contribute more efficiently to sustainable development within the framework of the SDGs, with an emphasis on the asset management industry. We argue that adopting more advanced practices in SI may improve the contribution of the asset management industry to sustainability. In this chapter, we will conduct a systematic review of the academic articles published in journals indexed at the ISI Web of Science and Scopus that has focused on the relationship between sustainable investment and the 2030 Agenda and Paris Climate Agreement between 2015 and 2021 (until May) to answer the following research questions:

RQ 1: Are the SDGs being integrated into the SI financial market?

RQ 2: How is SI contributing to achieving the SDGs?

RQ 3: Which SI strategy allows better progress towards the achievement of the SDGs?

RQ 4: Which market actors play the most relevant role in achieving the SDGs by integrating advanced SI practices? In which specific SDGs?

RQ 5: As a key player, to integrate contributing to SD, what are the challenges that fund managers face in the SDGs? How to respond to these challenges?

The results of this systematic literature review show that the asset management industry is key for integrating SDGs in the financial markets, whether through their influence in the investee companies or their investment products. The research findings also indicate that SDGs are being integrated into investment portfolios, particularly those managed according to impact investment strategy and those that practice and active ownership. However, the integration is not uniform and is characterized by SDG cherry-picking. Asset managers face many challenges to align effectively in the 2030 Agenda. The heterogeneity of data and methodologies of measurement and disclosure that could hinder the correct assessment of SDGs and how to implement investment strategies with bigger impact seems the more salient. However, there are others as the risks that climate change and other ESG issues could pose to portfolios, the perils of greenwashing and rainbow washing, or the temptation of rebranding without additionality in a market becoming exceedingly competitive.

The findings have important implications for the financial market, helping to highlight the key points for the future definition of actions to making progress in the goals and targets of the 2030 Agenda. Moreover, this research contributes to the extant literature on sustainable investment, overcoming the performance debate and focusing on the analysis of how sustainable investments could make a more effective contribution to sustainable development within the framework of the 2030 Agenda.

This chapter proceeds as follows. Section 2 details the methodology of the literature review. Section 3 discusses the results and section 4 concludes by connecting the literature review results to the future lines of research presented in the next chapters of the thesis.

1.2. Methodology of literature review

Systematic literature reviews are a form of research that uses explicit and accountable methods to bring together the existing literature (Gough et al., 2012). This literature review aims to identify how the relationship between sustainable investment and sustainable development has been addressed since the launch of the SDGs and the Paris Agreements to answer the research questions formulated. It is inspired by the systematic methodology proposed by Nawaz and Koç (2018).

Our search focuses on published articles in journals. Only articles in English were considered, and the analysis period ranges from 2015 to May 2021. Concretely, 2015 starts the period analyzed since it was the year when SDGs were launched, and the Paris agreement was reached.

The studies were identified in two renowned indexed electronic databases: ISI Web of Science (WoS) and Scopus. These two databases were chosen because they are databases with strictly selected multidisciplinary works, and global coverage. Moreover, the Scopus database incorporates papers on emerging issues, such as sustainability (Bui et al., 2020), expanding the scope of WoS.

1.2.1. Keywords and search

For the purpose of our search, the terms SDG and sustainable development are used like synonyms following authors who consider the 2030 Agenda a genuine social engagement to achieve worldwide sustainable development (Diez-Cañamero et al., 2020), the most important framework for global development (van Zanten & van Tulder, 2018) and the SDGs as the benchmark for responsible investors (Diener & Habisch, 2020).

In terms of investment, there is a variety in terminology (Daugaard, 2020). Although socially responsible investment (SRI) is still in use, recently, there has been a shift to sustainable investment (SI) (Camilleri, 2020). For Cunha et al. (2020), this term is more aligned with the efforts embedded in the global initiatives for global sustainable development. For SI strategies and practices, we refer to the terminology used by European Sustainable Investment Forum (Eurosif, 2018) and the Global Sustainable Investment Alliance (GSIA, 2020) and finally, we include the terms related to the asset management industry.

The keywords search was conducted across article titles, abstracts, and keywords lists. The keywords were connected with the Boolean operator AND. The asterisk wildcard was used to retrieve the word variants, for example, invest*, to capture both investment and investing. Table 1 summarizes the keywords for each Research Questions.

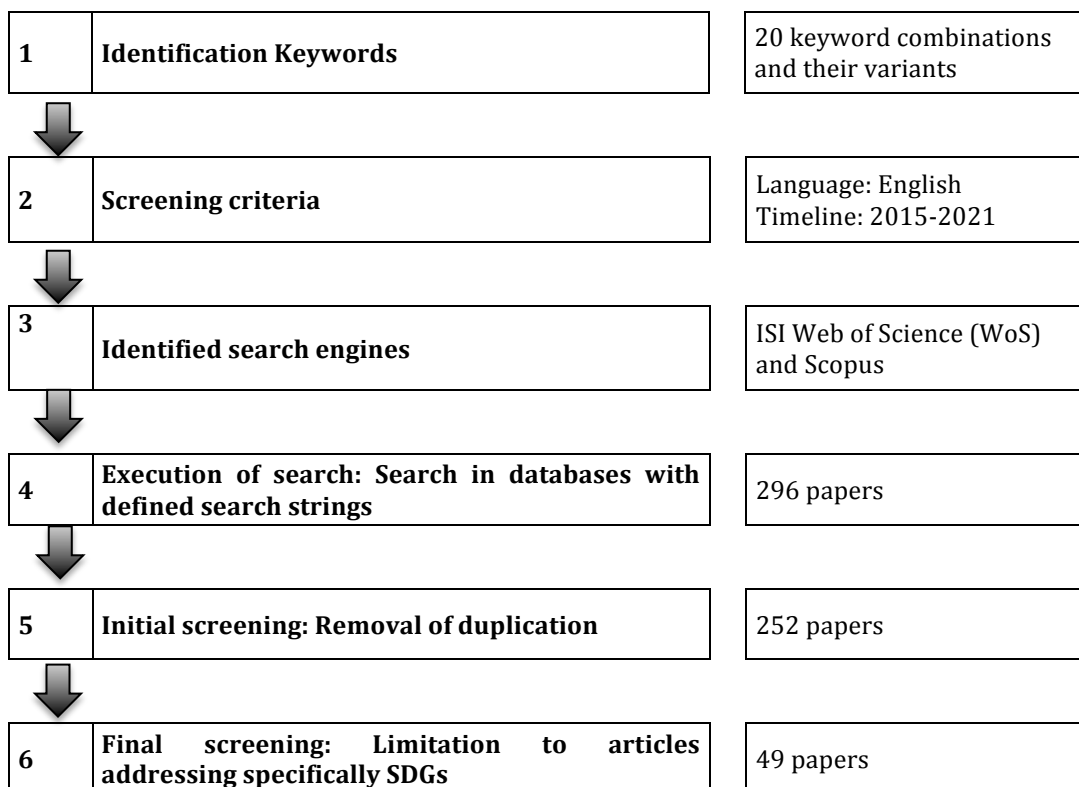
Table 1. Keywords linked to the Research Questions

Research Questions	Search terms
RQ 1: Are the SDGs being integrated into the SI financial market? RQ2: How is SI contributing to achieving the SDGs?	<ul style="list-style-type: none"> - sustainable development AND sustainable investment - sustainable development AND SRI - sustainable development AND Socially responsible investment - SDG AND sustainable investment - SDG AND SRI - SDG AND Socially responsible investment
RQ3. Which SI strategy allows better progress towards the achievement of the SDGs?	<ul style="list-style-type: none"> - sustainable development AND Screening - sustainable development AND ESG integration - sustainable development AND Thematic investment - sustainable development AND Impact investment

RQ 4: Which market actors play the most relevant role in achieving the SDGs by integrating advanced SI practices? In which specific SDGs?	<ul style="list-style-type: none"> - sustainable development AND Engagement - SDG AND Screening - SDG AND ESG integration - SDG AND Thematic investment - SDG AND Impact investment - SDG AND Engagement
RQ 5: As a key player, to integrate contributing to SD, what are the challenges that fund managers face in the SDGs? How to respond to these challenges?	<ul style="list-style-type: none"> - sustainable development AND asset management companies - sustainable development AND fund management companies - SDG AND asset management companies - SDG AND fund management companies

After entering the search strings, a total of 296 English-language published articles in journals were identified. Removing duplication eventually led to an interim result of 252 articles. By focusing on articles addressing specifically SDGs and sustainable development, the final selection could be limited to 49 articles subjected to full-text analysis. Figure 1 summarizes the procedure scheme of the literature research.

Figure 1. Process of the Systematic Literature Research



1.2.2. Codification

With the aim to answer the research questions and know the challenges that the sustainable finance market must face to integrate sustainability and respond to the SDGs, the data collected from the reviewed papers were classified and coded according to a set of categorization criteria to each research question (Figure 2).

Figure 2. Categorization criteria

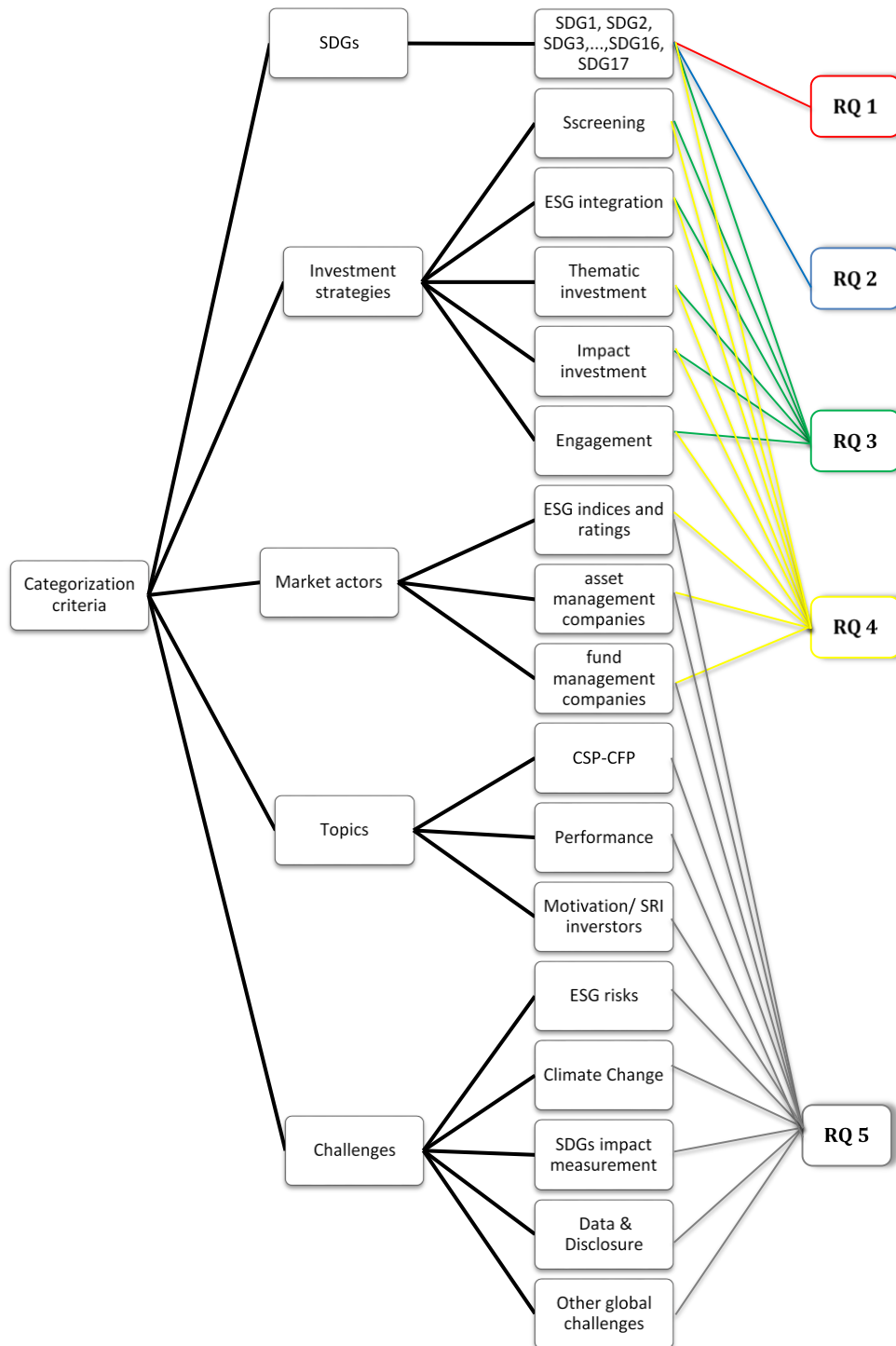


Table 2 shows the analyzed papers grouped by the categorization criteria. It should also be pointed out that the compilation of research papers includes information about the journals, author(s), year of publication, research objectives, study scope, sample size, analysis methodologies, main results and conclusions.

Table 2. Distribution of papers according to codification

	AUTHORS	JOURNAL	YEAR
SDGs			
	Betti, G; Consolandi, C; Eccles, RG	Sustainability	2018
	Consolandi, C; Phadke, H; Hawley, J; Eccles, RG	Organization and Environment	2020
	Gallego-Sosa, C; Gutiérrez-Fernández, M.; Fernández-Torres, Y; Nevado-Gil, MT	Sustainability	2021
	Hummel, K; Szekeley, M	Accounting in Europe	2021
	Krech, R; Kickbusch, I; Franz, C; Wells, N	BMJ Global Health	2018
	Lopez, B	Marketing Intelligence and Planning	2020
	Marti-Ballester, CP	Sustainable Production and Consumption	2021
	Marti-Ballester, CP	International Journal of Sustainable Development and World Ecology	2019
	Mendez-Suarez, M; Monfort, A; Gallardo, F	Sustainability	2020
	Miralles-Quiros, JL; Miralles-Quiros, MM; Nogueira, JM	Sustainability	2020
	Miralles-Quiros, JL; Miralles-Quiros, MM; Nogueira, JM	Business Strategy and the Environment	2019
	Muhmad, SN; Muhamad, R	Journal of Sustainable Finance and Investment	2020
	Rizzello, A; Kabli, A	Sustainability	2020
	Romano, M., Cirillo, A., Favino, C., Netti, A	Sustainability	2020
	Roy, J; Some, S; Das, N; Pathak, M	Environmental Research Letters	2021
	Schramade, Willem	Journal of Applied Corporate Finance	2017
	Tolliver, C; Keeley, AR; Managi, S	Environmental Research Letters	2019
	van Zanten, JA; van Tulder, R	Journal of International Business Policy	2018
	Wang, CN; Larsen, ML; Wang, Y	Journal of Sustainable Finance and Investment	2020
Investment Strategies			
Screening	Amel Zadeh, A; Serafeim, G	Financial Analysts Journal	2018
	Folqué, M; Escrig-Olmedo, E; Corzo Santamaría, T	Sustainable Development	2021
Thematics	Janik, B; Maruszewska, K	Sustainability	2020
Impact	Barber, BM; Morse, A; Yasuda, A	Journal of Financial Economics	2020
	Camilleri, MA	Social Responsibility Journal	2020
	Schramade, Willem	Journal of Applied Corporate Finance	2017
Engagement	Diener, J; Habisch, A	Corporate Governance	2020
	Kolbel, JF; Heeb, F; Paetzold, F; Busch, T	Organization and Environment	2020

Market Actors			
Banks	Dec & Masiukiewicz	Sustainability	2021
	Gallego-Sosa, C; Gutiérrez-Fernández, M.; Fernández-Torres, Y; Nevado-Gil, MT	Sustainability	2021
	Mendez-Suarez, M; Monfort, A; Gallardo, F	Sustainability	2020
	Rizzello, A; Kabli, A	Sustainability	2020
	Tolliver, C; Keeley, AR; Managi, S	Environmental Research Letters	2019
Ratings/Indexes	Berg, F.; Koelbel, JF.; Rigobon, R.	MIT Sloan School Working Paper	2019
	Boiral, O.; Talbot, D.;Brotherton, MC.	Business Strategy and the Environment	2020
	Diez-Canamero, B; Bishara, T; Otegi-Olaso, JR; Minguez, R; Fernandez, JM	Sustainability	2020
	Escrig-Olmedo, E.; Fernández-Izquierdo, MA.; Ferrero-Ferrero, I.; Rivera-Lirio, JM.; Muñoz-Torres, MJ	Sustainability	2019
	Munoz-Torres, MJ; Fernandez-Izquierdo, MA; Rivera-Lirio, JM; Escrig-Olmedo, E Widaywati, Luluk	Corporate Social Responsibility and Environmental Management Business Strategy and the Environment	2019 2020
Institutional Investors	Garcia-Sanchez, IM; Rodriguez-Ariza, L; Aibar-Guzman, B; Aibar-Guzman, C	Business Strategy and the Environment	2020
	Hummel, K; Szekely, M	Accounting in Europe	2021
	Marti-Ballester, CP	Sustainable Production and Consumption	2021
	Marti-Ballester, CP	International Journal of Sustainable Development and World Ecology	2019
	Miralles-Quiros, JL; Miralles-Quiros, MM; Nogueira, JM	Sustainability	2020
	Miralles-Quiros, JL; Miralles-Quiros, MM; Nogueira, JM	Business Strategy and the Environment	2019
	Niles, K; Moore, W	Journal of Sustainable Finance and Investment	2021
	Schramade, Willem	Journal of Applied Corporate Finance	2017
Multinationals	Lopez, B	Marketing Intelligence and Planning	2020
	Scheyvens, R; Banks, G; Hughes, E	Sustainable Development	2016
	van Zanten, JA; van Tulder, R	Journal of International Business Policy	2018
Multistakeholder	Eweje, G; Sajjad, A; Nath, SD; Kobayashi, K	Marketing Intelligence and Planning	2021

Topics			
CSP-CFP	Alshehhi, A; Nobanee, H; Khare, N	Sustainability	2018
	Junkus & Berry (2015)	Managerial finance	2015
	Martínez-Ferrero, J; Frías-Aceituno, JV	Business Strategy and the Environment	2015
	Muhmad, SN; Muhamad, R	Journal of Sustainable Finance and Investment	2020
Performance	Cunha, FAFD; de Oliveira, EM; Orsato, RJ; Klotzle, MC; Oliveira, FLC; Caiado, RGG	Business Strategy and the Environment	2020
	Marti-Ballester, CP	Sustainable Production and Consumption	2021
	Marti-Ballester, CP	International Journal of Sustainable Development and World Ecology	2019
	Miralles-Quiros, JL; Miralles-Quiros, MM; Nogueira, JM	Sustainability	2020
	Miralles-Quiros, JL; Miralles-Quiros, MM; Nogueira, JM	Business Strategy and the Environment	2019
Motivation	Amel Zadeh, A; Serafeim, G	Financial Analysts Journal	2018
	Daugaard, D	Accounting and Finance	2020
	Lopez, B	Marketing Intelligence and Planning	2020

Challenges			
ESG Risks	Migliorelli, Marco	Sustainability	2021
	Breitenstein, M; Nguyen, DK; Walther, T	Journal of Economic Surveys	2021
Climate change	Roy, J; Some, S; Das, N; Pathak, M	Environmental Research Letters	2021
	Schutze, F; Furst, S; Mielke, J; Steudle, GA; Wolf, S; Jaeger, CC	Sustainability	2017
	Tolliver, C; Keeley, AR; Managi, S	Environmental Research Letters	2019
	Betti, G; Consolandi, C; Eccles, RG	Sustainability	2018
SDG Impact and measurement	Consolandi, C; Phadke, H; Hawley, J; Eccles, RG	Organization and Environment	2020
	Diener, J; Habisch, A	Corporate Governance	2020
	Friede, G	Business Strategy and the Environment	2019
	Janik, B; Maruszewska, K	Sustainability	2020
	Kolbel, JF; Heeb, F; Paetzold, F; Busch, T	Organization and Environment	2020
	Schramade, Willem	Journal of Applied Corporate Finance	2017
	Scheyvens, R; Banks, G; Hughes, E	Sustainable Development	2016
	Wang, CN; Larsen, ML; Wang, Y	Journal of Sustainable Finance and Investment	2019
Data and reporting	Yoshino, N; Taghizadeh-Hesary, F; Otsuka, Miyu	Finance Research Letters	2021
	Amel Zadeh, A; Serafeim, G	Financial Analysts Journal	2018
	Diez-Canamero, B; Bishara, T; Otegi-Olaso, JR; Minguéz, R; Fernandez, JM	Sustainability	2020
	Garcia-Sanchez, IM; Rodriguez-Ariza, L; Aibar-Guzman, B; Aibar-Guzman, C	Business Strategy and the Environment	2020
	Hummel, K; Szekely, M	Accounting in Europe	2021
	Mgbame, C.O., Aderin, A., Ohalehi, P., Chijoke-Mgbame, A.M	Advances in Environmental Accounting and Management	2021
	Rosati, F; Faria, Lourenço G.D.	Journal of Cleaner Production	2019

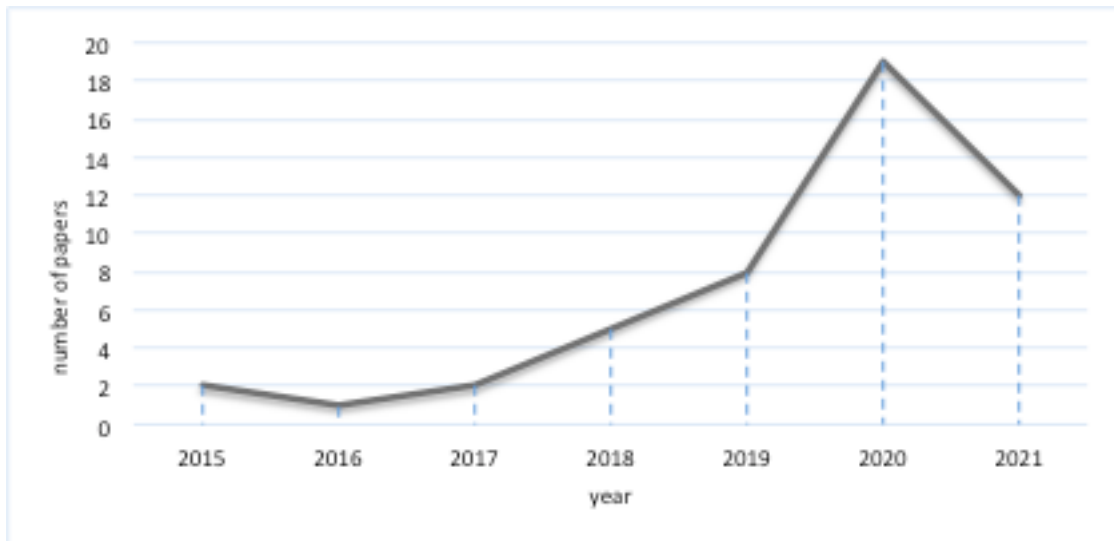
1.3. Review findings and discussion

As previously mentioned, this systematic literature review started by grouping 49 papers according to different research topics. This grouping has allowed us to carry out a review of the literature focused on detect research trends and organize past research to suggest future research lines. Therefore, in the next paragraphs, we present the main results of this analysis.

1.3.1. Major research topics in sustainable investment

Since the launch of the SDGs, the literature focused on the SI market and its contribution to sustainable development has increased (Figure 3), with the highest number of publications recorded in 2020, showing how SI is an adequate lever for the financial market to address the challenges of sustainability.

Figure 3. Distribution of publications per year*



*2021 from January to May

The topic of the relationship between Corporate Social Performance (CSP) and the effects that sustainability practices generate on the Financial Performance of a company (CFP) has been one of the most studied in the field of SI. In the period analyzed in this literature review, there are also some contributions to what Hamilton et al. (1993) coined as “doing well while doing good”.

For Junkus & Berry (2015), there might be a data problem when considering the value of a sustainable approach in a firm. The measures used to evaluate responsible behavior are generally quantitative, based on self-reporting, and annually disclosed. Moreover, a positive correlation does not clarify the direction of causality, so maybe only firms doing well can do good. In a study of 1960 multinational companies from 25 countries, Martínez-Ferrero & Frías-Aceituno (2015) address the causality direction to conclude that there is a positive and bidirectional relationship between CSP and CFP, though this relationship may differ between corporate governance systems. Alshehhi et al. (2018) review 132 papers to find that 78% of publications report a positive relationship between corporate sustainability and financial performance. They argue that the divergence of results on this relationship could be attributed to different methodologies and measurements of variables. The view of the positive relationship that dominates literature is confirmed by Muhmad & Muhamad (2020) in a study of 56 articles published between 2010 and 2019, where 96% report a positive relationship between sustainability practices and the financial performance of companies.

Another widely studied topic is performance evaluation. The evaluation of the performance of SI vehicles may be evolving to widen the focus to sustainability performance, but financial results are still a matter of interest in literature. Cunha et al. (2020) analyzed the performance of several Dow Jones Sustainability Indexes vs. their respective conventional peers and obtained heterogeneous results across regions. Focusing on a worldwide sample of 1,546 pension funds, Martí-Ballester (2019) explored if investing in SDG sectors could hurt performance. The results indicate that technology-related pension funds achieve the largest mean risk-adjusted return, while the energy-related pension funds achieve the lowest. In a later study on SDG-themed mutual funds in China, Martí-Ballester (2021) also found that SDG-themed mutual funds generally perform similar to market benchmarks.

Given the growing relevance of passive investments in the financial markets, Miralles-Quirós et al. (2019) analyze the effects of including SDGs-themed ETFs to stock-bond portfolios and find that investors could obtain benefits from this approach, mainly if they focus on SDG 8, Decent work, and economic growth, and SDG 9, Industry and innovation.

The topic of motivation has been the least addressed in the literature of SI in the age of SDGs framework. However, from many papers not exclusively related to motivation, it is clear that financial markets are called for a reorientation of their activities to promoting the transition to a sustainable economy in a process that might entail risks to be understood, but also a growth potential. Amel Zadeh & Serafeim (2018), with BNY Mellon's collaboration, surveyed 4,523 asset managing and asset-owning institutions to understand why and how investors use ESG information and the challenges and barriers to use it. The majority of respondents use ESG information because it is financially material to performance. The biggest challenge is the lack of comparability of information across firms. Daugaard (2020) addresses the motivation topic through a literature review but focusing on performance and concluding that more research on investor motivation is needed.

1.3.2. SDGs integration in the financial market

The SDGs constitute a paradigm shift for companies, investors, and the financial market. Despite the difficulties associated with their implementation, the essential role of the private sector in the 2030 Agenda is already being reflected in objectives and results of companies and asset managers. In a study of the firms listed in STOXX 600 Europe, Hummel & Szekely (2021) show a remarkable increase in SDG reporting, from 15% in 2015 to 58% in 2018. The study also reveals a steady rise in the quality of reporting. In an analysis of Spanish-listed companies, Lopez (2020) finds that 26 companies of IBEX 35 included their commitment to SDGs within

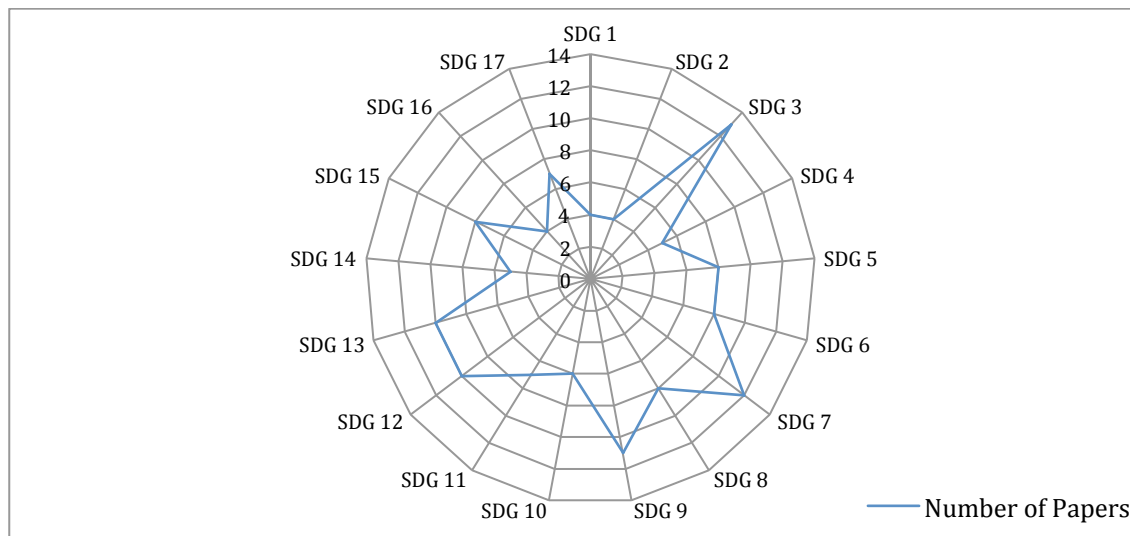
the sustainable report as of 2018. Institutional investors are also interested in how investee companies align with SDGs to monitor business contribution to the 2030 Agenda (García-Sánchez et al., 2020). The growing relevance of SDG reporting should be explained by the recent proposal adopted by European Commission in 2021 for a Corporate Sustainability Reporting Directive (CSRD), which would amend the existing reporting requirements of the NFRD. This initiative is presented as one of the priorities to strengthen the foundations of sustainable investment.

The interest in investing in the SDGs is based, according to Schramade (2017), on the returns to society, given the social function of the financial sector (Shiller, 2013) and the returns to shareholders since SDGs offer opportunities for value creation. The so-called investment case of the SDGs could generate at least USD 12 trillion in business opportunities and 380 million jobs until 2030 while improving relationships with stakeholders and enhancing business performance (Lopez, 2020). Nevertheless, investment in SDGs raises many questions since they do not offer equal investment opportunities. Some SDGs appear to be more investable than others.

As shown in Figure 4, according to the number of studies that have been carried out focusing on the SDGs and the financial market, the systematic literature review reveals that SDG 3, Good health and well-being, is the most analyzed, followed by SDG 7, Affordable and clean energy, and SDG 9, Industry, innovation, and infrastructure. SDG 12, Responsible consumption and production, and SDG 13, Climate Action, also stand out on investors' radar. Therefore, these SDGs appear to be a priority for both companies and investors.

Two of the “people” SDGs, the ones that attend to basic needs, SDG 1, No poverty, and SDG 2, Zero hunger, and the “peace” SDG, the number 16, seem to attract less interest from investors. Van Zanten & van Tulder (2018) argue that some sustainability challenges are less internally actionable by the companies in the private sector, which may prefer to address them through philanthropic contributions or multistakeholder initiatives. Schramade (2017) points out that corporates might prefer to invest in SDGs with transformational potential where they can make a difference. Betti et al. (2018) found that contributions to SDGs vary across sectors and that the sector with the highest potential impact is Healthcare. From their perspective the focus should be on SDGs that rank higher on material ESG issues that matter to investors. Building on Betti et al. (2018), Consolandi et al. (2020) argue that from a public policy perspective, for the achievement of the goals, companies should be provided with incentives to act even on nonmaterial issues to avoid a gap between SDG expectations and company actions.

Figure 4. SDGs analyzed in the scientific literature focused on financial market since SDGs launch

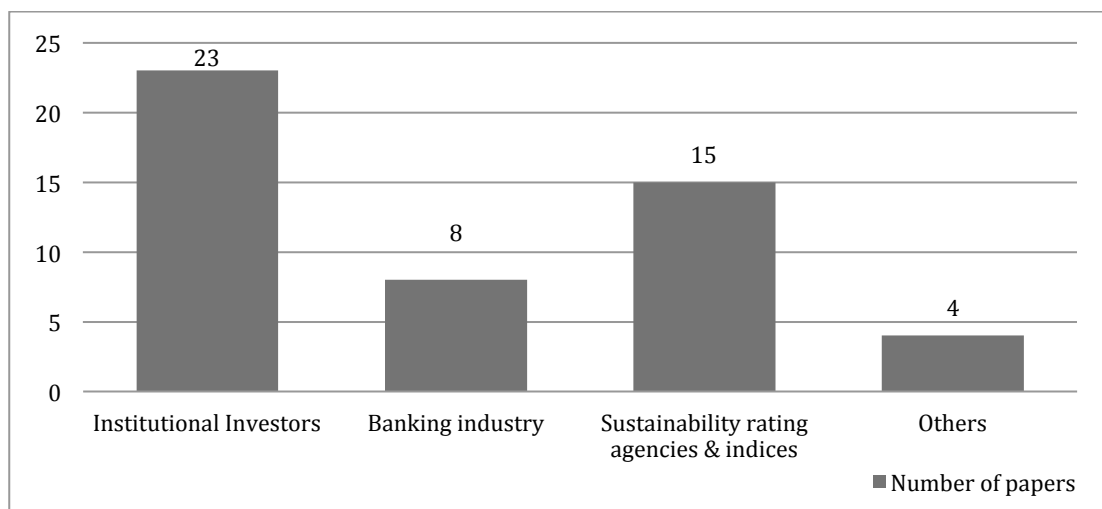


There is a branch of literature devoted to studying SDG 5, Gender equality. Gallego-Sosa et al. (2021) and Romano et al. (2020) explore the relationship between gender diversity on the Board of Directors and the degrees of engagement with the SDGs and the corporate sustainability practices of the companies.

1.3.3. Key market actors for the integration of SDGs in the financial market

The academic literature on integrating SDGs in the financial system has focused on studying the contribution of institutional investors, encompassing asset management companies, pension funds, and sovereign wealth funds in the search for sustainable development, as well as other actors in the financial markets (Figure 5).

Figure 5. Market actors analyzed in literature focused on the financial market since SDGs launch



To test the influence of institutional investors on corporate strategies and decisions that also extends to sustainability practices, García-Sánchez et al. (2020) study the relationship between institutional ownership and CSR practices. The results show that the relevance of information disclosed improves with the presence of foreign investors and pension funds. Amel Zadeh & Serafeim (2018) analyze why investors use ESG data and find that a majority of the investors who consider ESG information do so because this information is financially material to investment performance. Some authors (Betti et al., 2018; Consolandi et al., 2020; Schramade, 2017) propose frameworks for more significant impact when investing in SDGs. Miralles-Quirós et al. (2020) analyze investing techniques and the use of certain vehicles as ETFs in the portfolio construction (Miralles-Quirós et al., 2019) to boost alphas. Martí-Ballester (2019) explore pension funds' contribution to sustainable development, while Niles & Moore (2021) study the role of sovereign wealth funds.

The evaluation and measurement of contribution to SDGs is also a critical topic for academic literature. The development of sustainable investment towards practices more data-intensive means that investors and companies rely more on indexes, rankings and ratings. Third-party data providers assess firms' ESG performance (Berg et al., 2019), offer ESG metrics as a proxy for sustainability performance (Widyawati, 2020), and have become a key reference in financial markets (Escrig-Olmedo et al., 2019). Despite their relevant role, more and more authors focus on the limits and shortcomings of what Diez-Cañamero et al. (2020) refer to as the Corporate Sustainability Systems (CSS) universe. These problems will be discussed in depth later in this study on the review of the challenges, particularly in relation to sustainability risks and sustainability performance (Boiral et al., 2020; Muñoz-Torres et al. 2018).

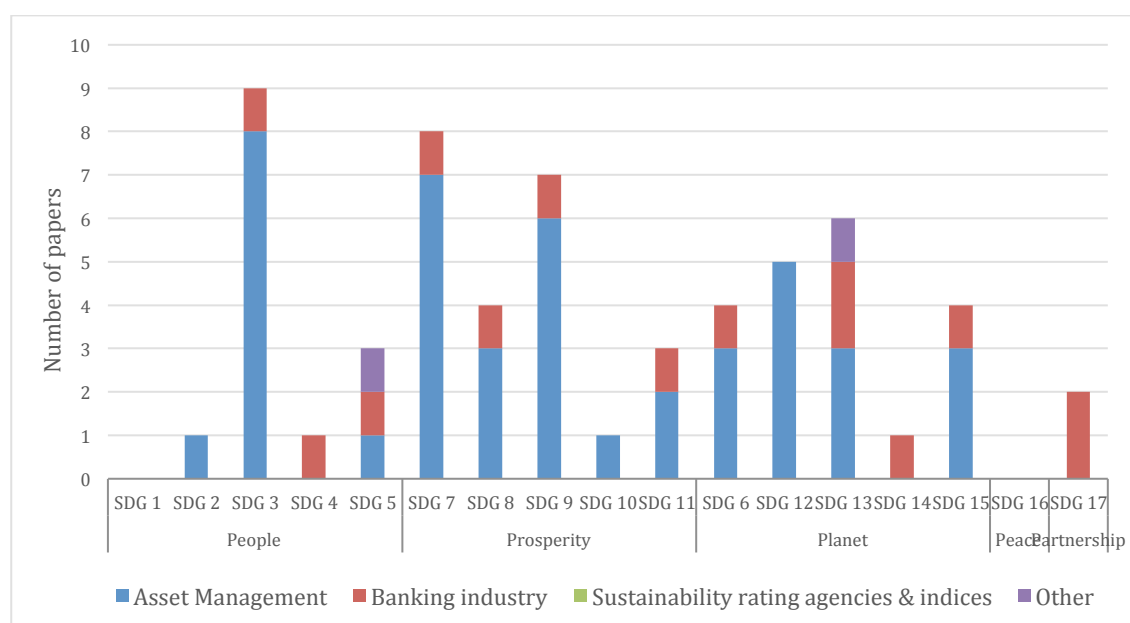
The banking industry has also been studied as a key market actor in SDGs finance. Gallego-Sosa et al. (2021) examine the degree of commitment to the 2030 Agenda Sustainable Development Goals in the European banking sector. Dec & Masiukiewicz (2021) analyze how banks can contribute to sustainable development by offering and advising on responsible financial products. Méndez-Suárez et al. (2020) explore the role of banks in promoting the issuance of social impact bonds (SIBs), a new form of social- financial hybrid product particularly suitable to address SDG 1, No poverty, SDG 10, Reduced inequality, and SDG 17 on Partnerships. SIBs are also studied by Rizzello & Kabli (2020), while Tolliver et al. (2019) focus on the issuance of green bonds. Concerning environmental risks, Breitenstein et al. (2021) underscore how central banks and regulators have warned of climate risks and highlighted the importance of

financial risk assessment and management in banks as this can mitigate the threats of climate change on the financial industry.

The commitment of investee companies to the 2030 Agenda is also a matter of interest for academia. Lopez (2020), Scheyvens et al. (2016), van Zanten & van Tulder (2018), analyze how multinational companies and the private sector are addressing sustainability challenges. Eweje et al. (2021) argue that given SDGs' scope and interconnected nature, their implementation requires a transformation of multi-stakeholder partnerships.

Furthering somewhat more into the analysis to know which market actors play the most relevant role in achieving SDGs, Figure 6 shows how the literature focused on the main market actors has studied the different SDGs grouped into five pillars (People, Prosperity, Planet, Peace, and Partnership). The relationship between the market actors and specific SDGs show that, although into the People pillar the SDG 3, Good Health and well-being, is the one raising more interest, as a whole, the SDGs most studied are included in the Prosperity Pillar, which encompasses SDG 7 to 11, followed by the SDGs included into Planet Pillar (SDGs, 6, 12, 13, 14 and 15). The literature review reveals that the asset management industry has a broader perspective and is the financial market actor analyzed more related to alignment with the most SDGs, while the banking sector seems to be more focused on climate action (SDG 13) through the issuance of green bonds and partnerships (SDG 17) via social bonds.

Figure 6. Market actors and SDGs



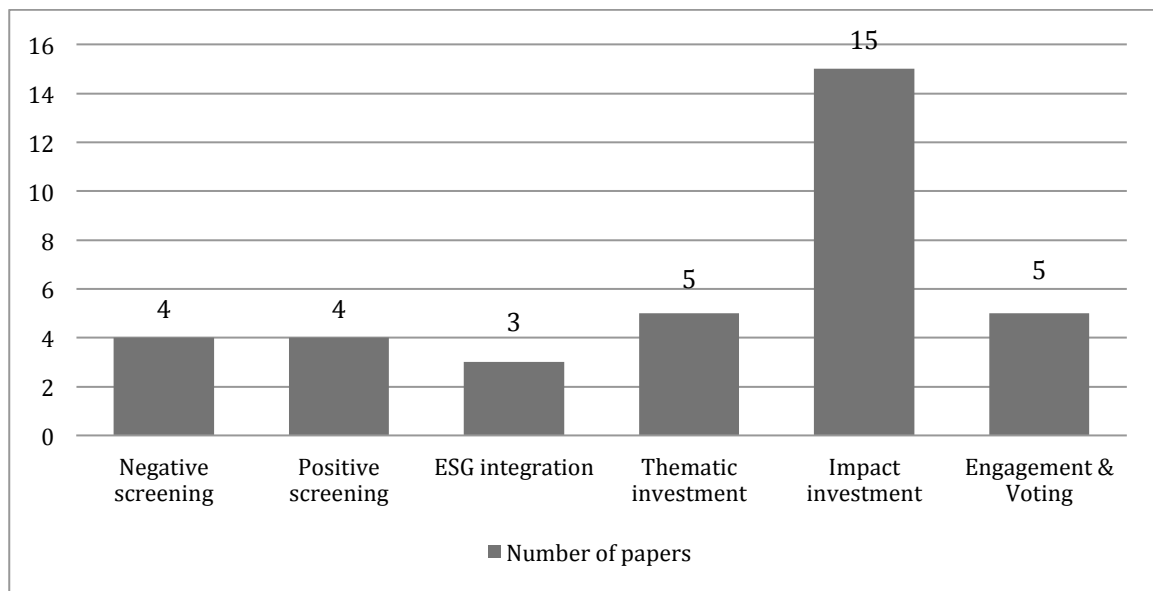
1.3.4. SI Strategies and their contribution to achieving the SDGs

The contribution of institutional investors to the 2030 Agenda is critical. Among them, the mutual funds industry is called to transform savings from investors into the financial capital needed to address SDGs (Martí-Ballester, 2021). Therefore, there is a need to deepen the knowledge on which investment strategies deployed by asset managers could have a higher contribution to sustainability.

Historically, most scholars have assessed SI from a financial perspective (Diener & Habisch, 2021). The comparison of SI financial performance vs. conventional investments is still a matter of interest for academia, but we are witnessing an evolution in literature. The scope and challenges of the SDGs framework and the urgency of the fight against climate change demand another perspective. Hence, a growing branch of literature is transcending the financial performance debate to analyze and question the real contribution of investment vehicles and strategies to sustainability (Diener & Habisch, 2021; Friede, 2019; Kölbel et al., 2020; Migliorelli, 2021).

Figure 7 shows how the most recent academic literature is studying how different SI strategies can contribute to sustainable development.

Figure 7. SI strategies analyzed in the academic literature since SDGs launch



For Diener & Habisch (2021), purely exclusionary strategies offer limited sustainability effects since there is no motivation for investee companies to act in specific ways. From their view, engagement is the most potent tool to influence corporate behavior and the best strategy for enforcing sustainability goals. In their study on how investors use ESG information, Amel Zadeh & Serafeim (2018) found that it is predominantly used, but not only, to engage with

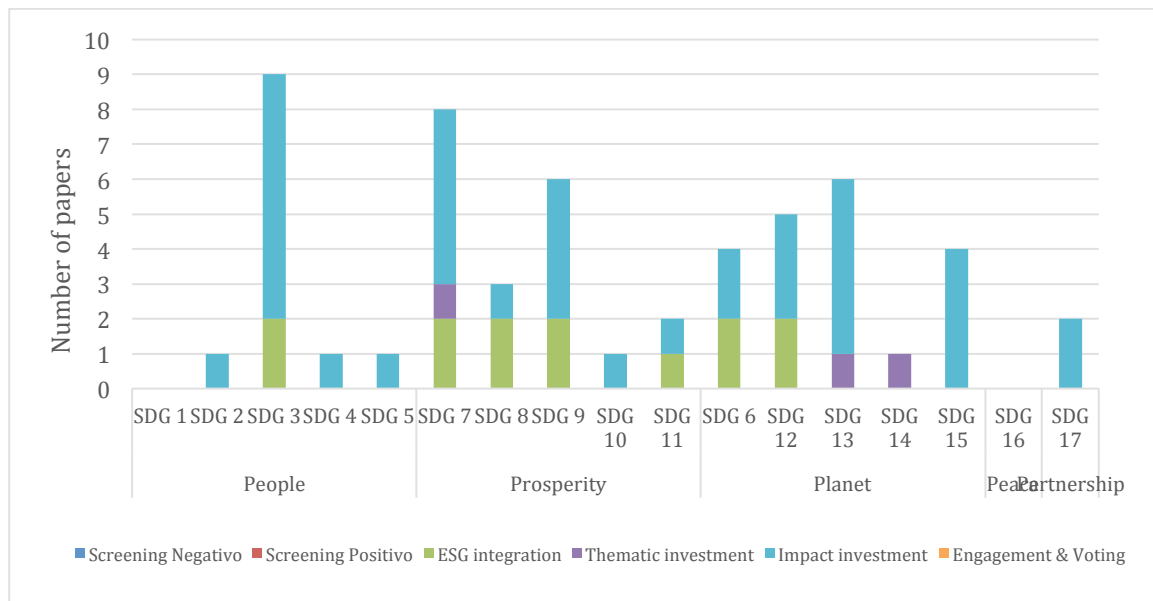
companies. Kölbl et al. (2020) explore how SI could have a higher impact in contributing to societal goals to conclude that the impact of shareholder engagement is well supported in literature while the impact of capital allocation is only partial.

Regarding sustainability-themed investments (STIs), Janik & Maruszewska (2020) study revealed no significant correlation between environmental investments and environmental indicators among the European countries analyzed, concluding that there is no substantial evidence of the contribution of investors' assets to the improvement of the environment.

Barber et al. (2021) and Camilleri (2020) have focused on impact investment. This strategy has its origins in the Venture Capital community and, given its double intention of generating social and environmental measurable and intentional impact alongside a financial return, has become one of the fastest-growing areas of SI (Camilleri, 2020). Impact investment is now being adapted to listed companies to invest in the alignment with SDGs. Schramade (2017) proposes a framework to invest in listed companies aligned with SDGs with an impact investment perspective, emphasizing the need to set measurable objectives in accordance with KPIS that also allow for measurement and reporting. In the fixed income world, two instruments reflect the impact investment vocation of intentionality and measurement, the social impact bonds (SIBs) (Méndez-Suárez et al., 2020; Rizzello & Kabli, 2020) and the green bonds (Tolliver et al., 2019).

Therefore, the literature is mainly focusing on impact investment and shows that a change is taking place in the impact investment segment to link it more and more with the achievement of the SDGs. Figure 8 shows clearly this trend, where again SDG 3 -Good Health and well-being-, SDG 7 -Clean Energy-, SDG 9 -Innovation-, and SDG 13 -Climate Action- are the ones attracting more interest. In general terms, we can say that the academic literature shows a clear interest in studying how, through two advanced SI strategies, such as impact investment and ESG integration, the SDGs included in the Planet pillar are being addressed, followed by those included in the Prosperity pillar.

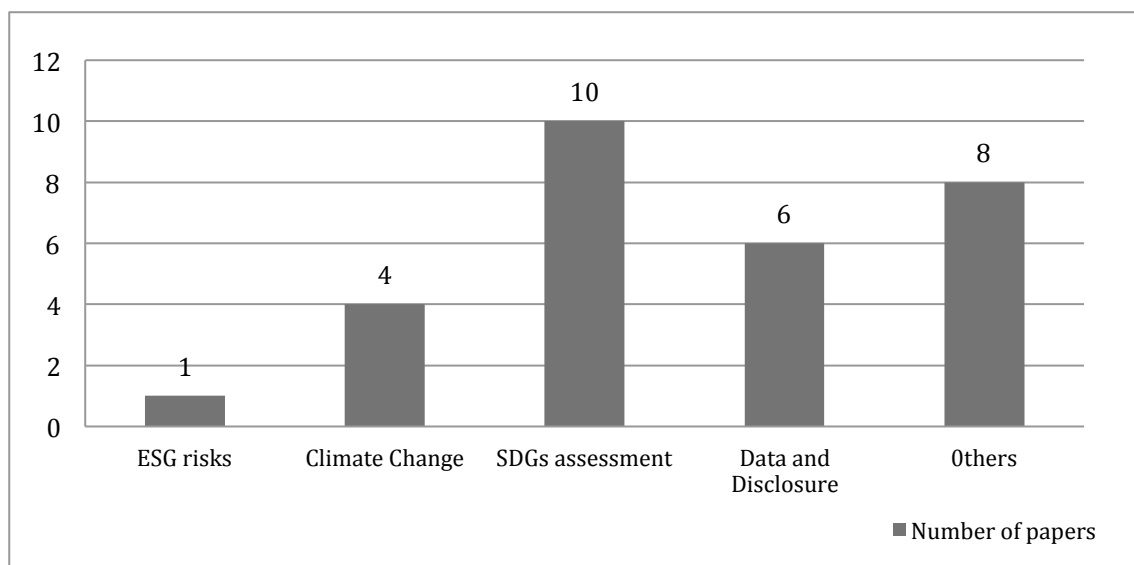
Figure 8. SI Strategies and SDGs



1.3.5. Challenges a new paths

The academic literature on sustainable investment and financial markets has focused until recently on comparing the financial performance of SI investment vs. the conventional one or on the primary motivations for such investments. However, the launch of the SDGs, which constitute a framework for sustainability, and the current context of global risks put researchers in the face of new challenges in the financial market, concretely in the investment management industry.

Figure 9. New challenges in the context of the SDGs for the financial market since SDGs launch



As Migliorelli (2021) points out, SI has evolved over time. In his view, the ESG concept meant that the financial institutions should incorporate sustainability considerations in investment decision-making to reflect environmental, social, and governance risks. Today SI is also the bridge needed to finance the transition towards a more sustainable society and a climate-neutral economy. This evolution requires understanding what sustainability is and how sustainability can be achieved. Migliorelli argues that the overabundance and heterogeneity of frameworks, definitions, and standards could create risks that hinder policy and industry efforts to mainstream SI. Among the main risks, the first is rebranding without additionality or the risk of labeling investments that do not flow to sustainable sectors or activities as sustainable. The second risk is greenwashing and sustainable washing, i.e., “the use of deceptive strategies to build a sustainability-oriented image.” In this context, the European Union’s Sustainable Finance Disclosure Regulation (SFDR, 2019) imposes transparency and disclosure requirements about the incorporation of sustainability risks into the investment decision-making process.

Among the risks that literature has addressed, special attention has been paid to climate change-related ones. Breitenstein et al. (2021) conducted a literature review on climate risks and the financial sector and find three main topics: (i) the impact of environmental concern on financial risks; (ii) the environmental risk practices in the financial sector; and (iii) measures to assess the financial exposure to climate change risks. This assessment is critical since it incentivizes the adoption of more proactive environmental practices. Roy et al. (2021) explore the interconnection of the SDGs framework with emission mitigation to analyze what actions can be taken and who are the actors associated with these actions. Janik & Maruszewska (2020) found that sustainability-themed investments (STIs) do not significantly affect environmental activities in Europe. Schütze et al. (2017) offer a possible explanation for this mismatch since they argue that the economic models in use do not allow evaluating a sustainability transition that might have substantial positive effects.

More recently, some authors are putting into question the real impact of SI in sustainable development. Kölbel et al. (2019) define investor impact “as the change that investor activities achieve in company impact, and company impact as the change that company activities achieve in social and environmental parameters”(Kölbel et al., 2019, p. 2). The lack of suitable data to measure the evolution of investor impact could result in a modest impact, despite the volume of assets under management. There is a problem with SDG assessment. Friede (2019) also mentions the quality of data in his exploration of the impediments of investors to integrate sustainability factors in their investment decisions. However, the main one is the perceived

lack of business case, the perception that a company's sustainability performance could be unclear, irrelevant, or damaging for financial performance. For Scheyvens et al. (2016), this inability to move beyond the business case considering sustainability practices as an add-on puts into question the role of the private sector as a sustainable development actor.

Another branch of literature (Betti et al., 2018; Consolandi et al., 2020; Schramade, 2017) addresses the SDG assessment as an issue of materiality indicators and "SDG picking": not all the SDGs are equally investable since they offer different business opportunities. Hence, investors should focus on the SDGs where they could have a bigger impact. Diener & Habisch (2020) consider that if the volume of SI is growing, but the impact in sustainable development is not, it is precisely for the emphasis in the financial information. The lack of attention to non-financial information (NFI) explains why the current asset management practices do not reflect their role for environmental and societal betterment. Yoshino et al. (2021) argue that the impact of institutional investors in sustainability is hindered by their dependence on different consulting firms with different methodologies and models that distort the investment processes.

The challenge of heterogeneity in assessing investor impact on SDGs alignment is linked with the heterogeneity of data. The need to measure sustainability as a result of the willingness of the investors to create portfolios with a better ESG performance has led to the rise of diverse initiatives as social accounting, sustainability reporting, performance indicators, and ESG ratings that constitute what Diez-Cañamero et al. (2020, pp 1) define as a "chaotic universe".

Despite the heterogeneity of standards, academia is focusing more and more on the practice of SDG reporting. For Rosati & Faria (2019) reporting publicly on how an organization addresses SDGs is crucial for the integration of SDGs into business. The reporting fosters the alignment of capital with sustainable development and the mobilization of responsible investment in SDGs. Mgbame et al. (2020) argue that while the increasing levels of disclosure have not yet reduced the negative externalities of corporate activities significantly, sustainability reporting could inculcate consciousness about social and environmental impacts. Reporting should be a tool for sustainability.

Hummel & Szekely (2021) consider that companies are more willing to disclose their contributions to SDGs achievement when they have institutional investors who could factor in those achievements. In their study of the influence of institutional investors, García-Sánchez et al. (2020) find that certain types of owners like foreign institutions, pension funds, and mutual funds exert a positive boost into the 2030 Agenda.

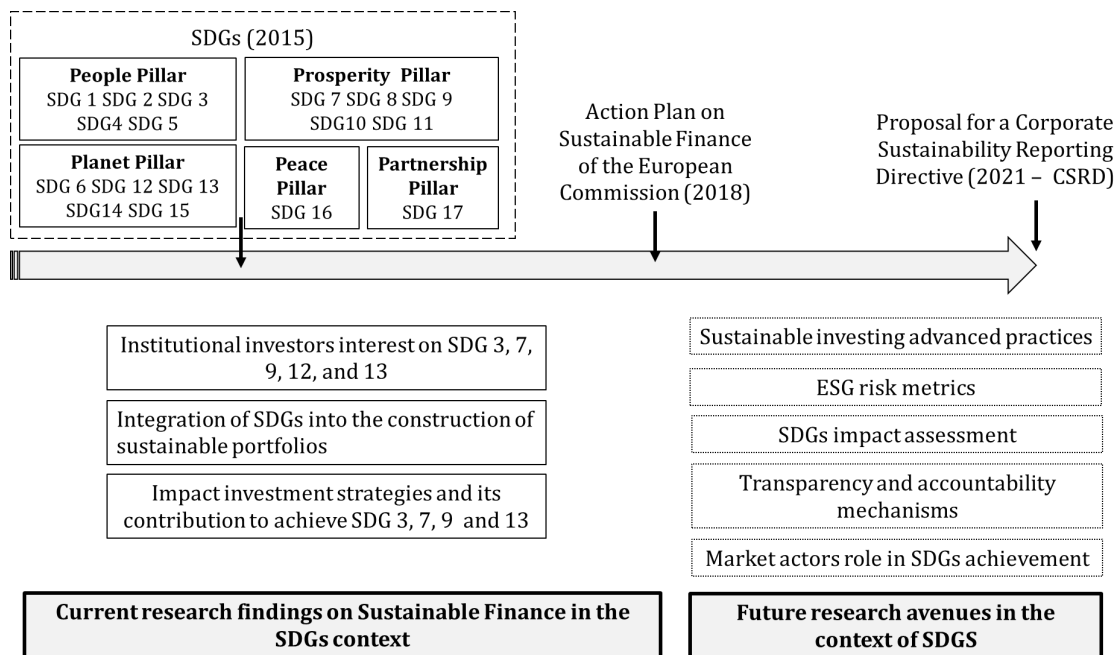
The Framework for SDG-aligned Finance (2020), launched in 2020 by OECD and UNDP, concludes that notwithstanding with the efforts of companies and investors, the lack of a common language and interpretation of the objectives of the SDGs hinders the SDG alignment. The public and private sectors should face the challenge of removing the obstacles preventing alignment, addressing the problems that arise mainly from the proliferation of market-based standards that rely on different methodologies, the weak accountability, and the fragmented regulation.

1.4. Conclusion

This chapter aims to know how the financial market, through sustainable investment, contributes to sustainable development within the framework of the SDGs. The systematic literature review allows us to answer the research questions and propose future research avenues for the following chapters. This review, like other studies, has certain limitations derived from search engineering. In addition, research goals have conditioned the exclusion of articles that merely name SDGs to focus on those that analyze their effective integration. Moreover, the fact that the SDGs were launched in 2015 determines that not enough time has elapsed to analyze the total contribution of the SI to achieving the SDGs.

Sustainable finance seems crucial to enforce the EU Commission's strategy towards achieving the SDGs. Therefore, it seems necessary to raise several questions to delve into how the SI market behaves in this new context of global sustainability risks and where efforts should be focused. Figure 10 shows the main results obtained from current studies and future lines of research that help answer the research questions.

Figure 10: Current research findings and future research avenues



In answer to RQ 1: *Are the SDGs being integrated into the SI financial market?*, and RQ 2: *How is SI contributing to achieving the SDGs?*, the research findings indicate that since its launch in 2015, the 2030 Agenda has been gaining a place on the investors’ radar. While investee companies are increasingly committing to align with SDGs and disclosing their targets and achievements, institutional investors and other financial actors are showing a growing interest in how companies align with SDGs to monitor their contributions in order to build more sustainable portfolios. This interest arises from the potential returns to society and the need to close the finance gap but mainly from the lofty business case of the sustainable agenda. However, the heterogeneity of corporate ESG data and rules on reporting non-financial information and the emphasis on the business case makes some SDGs more investable than others, so the investment in SDGs is characterized by certain cherry-picking. Specifically, according to the literature review findings, SDG 3, 7, 9, 12, and 13 appear to attract more market interest. Nevertheless, the 17 SDGs are equally important and have an integrated nature (Forestier & Kim, 2020).

Future research should shed light on ESG metrics and reporting frameworks, seeking to analyze the impact of companies on the different SDGs as a measure to determine the materiality of the SDGs to support a meaningful change towards more sustainable business practices.

In answer to *RQ3: Which SI strategy allows better progress towards achieving the SDGs?*, the results of the literature review highlight the power of engagement and impact investing. The practice of impact investing predates the SDGs, but the 2030 Agenda enhances its role within a framework where targeting and measurement are essential. These characteristics of impact investing allow it to play a more relevant role than other less advanced sustainable investment strategies. However, despite its growth in recent years, impact investing is still a minor segment of the SI universe, especially compared with negative screening. According to data from the last report of the Global Sustainable Investment Alliance (GSIA, 2020), the global volume of assets under management of impact investment is just 2% of the worldwide volume in negative screening strategies. For this reason, a call for further work has to be made in order to explore impact investing more deeply in future publications. It is also essential to analyze how other advanced SI practices address societal challenges that generate competitive financial returns and contribute to the SDGs.

In response to *RQ 4: Which market actors play the most relevant role in achieving the SDGs by integrating advanced SI practices? In which specific SDGs?*, the actors most studied by the literature are institutional investors, specifically the asset management industry. Their role in bridging the finance gap is essential in a sustainability agenda based on public-private partnerships. The findings of the analyzed studies also underline how institutional investors might influence the investee companies towards a deeper alignment with the most SDGs. Banks are also called upon to contribute to the 2030 Agenda by issuing green and social bonds, distributing sustainable investment products to their clients, and integrating ESG factors in their lending activities. The shift of sustainable investment to a more data-dependent practice explains the rise of data providers that produce rankings, indices, and ratings. Still, the heterogeneity of methodologies poses a significant challenge to SI. Further academic studies seem to be needed in three lines of research: (i) ESG metrics used by rating agencies to measure a company's contribution to the SDGs (positive and negative impacts) in a context of global risks; (ii) transparency and accountability mechanisms on SDG that allow institutional investors and companies to take better investment and strategic decisions and, (iii) banking industry role in the alignment of SI strategies with the SDGs and the development of new financial products that address the SDGs.

It is therefore evident that heterogeneity and different methodologies of measurement and disclosure are among the main challenges that asset managers face investing more effectively in SDGs, which is the topic of *RQ5: What are the challenges that fund managers face in the SDGs? How to respond to these challenges?* The correct assessment of SDGs and how to implement

investment strategies with bigger impact, as well as the risks that climate change and other ESG issues could pose to a portfolio, are also major concerns, according to the research results. The construction of sustainable portfolios should also avoid other perils in a market becoming exceedingly competitive, namely, greenwashing, rainbow washing, and the temptation of rebranding without additionality.

The systematic literature review shows that the asset management industry is critical for integrating SDGs in the financial markets, whether through their influence in the investee companies or their investment products. The research findings also indicate that SDGs are being integrated into investment portfolios, particularly those managed according to impact investment strategy and those that practice and active ownership. Nevertheless, despite the growth of volume and flows directed towards SI funds, sustainability indicators have not experienced a significant improvement. Considering that not all sustainable investment strategies are created equal and do not create the same outcomes on sustainable development (Folqué et al., 2021), future studies should focus on advanced sustainable investment practices that could contribute more and more effectively to sustainability.

This thesis intends to contribute to the research topic of how the SI market, through the fund asset management industry, contributes to sustainable development, within the framework of the SDGs, by defining advanced socially responsible investment practices under the new global challenges. To that end, in chapter 2, we analyze which factors make institutional investors adopt advanced practices of sustainable investment, and in chapter 3, we examine which SI strategy delivers higher sustainability outcomes.

Second part: Empirical Analysis

Chapter Two

INTEGRATION OF ADVANCED SRI PRACTICES INTO THE EUROPEAN ASSET MANAGEMENT INDUSTRY: A SURVEY OF DRIVERS

Sustainable and responsible investment (SRI) has experienced impressive growth in the last two decades. However, the adoption of advanced SRI strategies has not kept pace with this expansion, a critical development regarding its potential impact on sustainability. For this reason, this study aims to identify the main drivers for the adoption of advanced sustainable and responsible investment practices by asset management companies to know why and which companies better advance the strengthening of SRI in the European financial market considering an original combination of different SRI drivers. To investigate which factors seem to be more decisive in adopting more sophisticated SRI practices, we first conducted a survey among fund management *companies* that manage and/or distribute investment funds in Europe. Second, we used logistic and multivariate regressions as analytical tools for testing the hypotheses. Results show that societal pressures and a formal corporate social responsibility policy are the main drivers for adopting advanced SRI practices by asset management companies. Identifying the main drivers of integrating advanced SRI practices in asset management companies will allow them to make more informed investment decisions, and it will help bring sustainable finance into the mainstream.

2.1. Introduction

Since the launch of UN Sustainable Development Goals (SDGs) in 2015, the global community has a new agenda and framework on how to face the most urgent global problems challenging the world. Given the magnitude and the scope of these 17 SDGs, the participation of the private sector and financial markets, especially institutional investors, is crucial to achieving sustainable development.

In fact, as Shiller (2013) underlines, finance supports many activities in society, but innovation in finance is critical if it wants to be relevant as a mean of achieving society's goals, especially in the aftermath the global financial crisis and the current pandemic crisis.

The relevance of the role of institutional investors is underlined by Sandberg (2011), since they are the major players in the world's financial markets. Busch et al. (2015) explored the role of financial markets for sustainable development, suggesting that a reorientation toward a long-term paradigm for sustainable investments is essential. Sievänen et al. (2017) consider that part of the financial industry has responded by promising it will do better.

The European Union is making efforts to integrate sustainability issues into its financial policy framework to mobilize finance for sustainable growth. To that end, the European Commission has released an 'Action Plan for Financing Sustainable Growth' (EC, 2018), that comprises many legislative proposals, including regulations on Taxonomy, sustainable benchmarks, and disclosure, among others. A central plank of the European Commission Action Plan for Financing Sustainable Growth is the Sustainable Finance Disclosure Regulation (SFDR) that provides greater transparency on the degree of sustainability of financial products that channel private investment towards sustainable investing. Its phase-in implementation started in March 2021. In this context, institutional investors have the opportunity to be an integral part of the global sustainability agenda, integrating sustainability into the investment decision-making process through sustainable and responsible investment (SRI).

SRI is "a long-term oriented investment approach, which integrates environmental, social and governance (ESG) factors in the research, analysis and selection process of securities within an investment portfolio. It combines fundamental analysis and engagement with an evaluation of ESG factors to better capture long-term returns for investors and to benefit society by influencing the behavior of companies" (Eurosif, 2016).

Within the finance universe, the asset management industry is now more committed than ever to sustainable and responsible investments. Global growth in sustainable investments demonstrates the increasing demand among investors—both institutional and retail—for greater disclosure and integration into the investment process of ESG issues. Lewis and Juravle (2010) consider that explaining this growth is complex. From their point of view, it involves shifts in personal and collective values, reactions to corporate scandals, scientific and media pronouncements about climate change, governmental and supranational initiatives, responses from financial markets, and the influence of SRI innovators. In this combination between external pressures and internal pressures, we could outline some of the drivers responsible for the evolution and explosion of SRI, from niche to mainstream. However, further research is needed.

Only a few research papers have focused on SRI drivers. Dilla et al. (2016) studied nonprofessional investors' views regarding SRI; Przychodzen et al. (2016) analyzed fund manager's 'objective' (e.g., professional experience) and 'subjective' (e.g., personal points of view, attitudes, and perceptions) motivations toward ESG issues and, Balaguer et al. (2008) covered the relationship between fund management companies' internal policy on CSR and the fact that they manage and/or market SRI funds. Nilsson (2009) addresses reasons for consumer investment in SRI profiled mutual funds, and Nilsson et al. (2010) analyzed the SR-investor decision-making process.

This study represents an initial attempt to examine how a combination of different SRI drivers could contribute to integrate sustainability in the mainstream market. Given the urgent challenges the SDGs framework encompasses and considering how the asset management industry can make a positive contribution to the sustainability agenda, our primary motivation is to understand the drivers and factors fostering the growth and expansion of sustainability strategies and SRI advanced practices into the asset management industry.

Different levels of integration of ESG advanced practices into asset management companies may have a diverse degree of impact on sustainability, which implies that they can contribute differently to achieving the SDGs.

For this reason, the objective of this paper is to identify the main drivers for the adoption of advanced SRI practices by asset management companies in order to know why and which companies better advance the strengthening of SRI in the European financial market. In particular, we investigate which factors -whether on the organization of the asset management companies or in their working environments- seem to be more decisive in the adoption of more sophisticated SRI practices and therefore fostering sustainability into the financial market. Our research questions focus on the influence of internal and external drivers. We seek to answer the following question:

RQ.1. Which factors (internal or external) to the asset management companies can be considered as drivers for the adoption of advanced SRI practices by the European asset management industry?

To answer this research question, we propose an empirical analysis, concretely a logistic regression model. To gather data on asset management companies, we conducted a survey among 45 asset management companies that manage and/or distribute investment funds in Europe, which represent a third part of the total assets under management in open funds in

Europe, excluding Fund of Funds and Feeders, according to Morningstar Direct data. This survey has allowed us to obtain specific data that are not available in traditional databases.

Specifically, on the one hand, our study is focused in Europe because it is the world region where SRI has grown more and where is finding more support and impulse through legislative initiatives. According to the report Global Sustainable Investment Review elaborated by GSIA (2018), at the start of 2018, there were globally \$30.7 trillion of assets professionally managed under SRI strategies, an increase of 34% since 2016. Nearly a half of these global assets are managed in Europe, where total assets committed to sustainable and responsible investment strategies reached \$14.07 trillion.

On the other hand, several reasons justify putting the asset management industry in the spotlight of this study.

First, SRI funds in Europe are now, given their growth and volume, a force to be recognized and a phenomenon that merits further and more in-depth research. As Escrig-Olmedo et al. (2013) consider, following Epstein and Widener (2011), better management of the impacts of corporate products, services, processes, and other activities on various corporate stakeholders can improve both corporate sustainability performance and financial performance.

Second, more in-depth knowledge of how asset management companies integrate SDGs in their strategies and their investment process, using ESG criteria is necessary, since as Berry and Yeung, (2013) point out, screening is just a phase in the process of building a portfolio. Given the dual nature of SRI, the analysis of extra-financial risks and returns deserves more attention. This research seems more critical in this post COP 21 and SDGs era.

The research findings indicate that societal pressures and having a formal corporate social responsibility (CSR) policy are the main drivers for the adoption of advanced SRI practices by asset management companies. This research makes a significant contribution to the extant literature, clarifying how the new advanced SRI practices –that could contribute to sustainable development– are integrated into asset management industry and deepening in the study of the main drivers of SRI in the new financial context, where investors are more committed to social and environmental aspects. Moreover, from a practical standpoint, the paper is expected to contribute to changes in the asset management industry, providing useful insights about different market actors interested in the integration of SRI practices into the financial market, which could be useful for the design of new strategies and investment products.

This study is organized as follows: Section 2 reviews the relevant literature, while Section 3 describes the methodology, including the econometric model, data, and study variables. Section 4 presents the empirical results. Section 5 concludes the study.

2.2 Theoretical Framework and Hypotheses

2.2.1. Drivers of SRI

In the last 20 years, sustainable and responsible investment (SRI) has been a major trend in the mutual fund industry, evolving from a niche concept to a mainstream approach. Most of the authors agree on the dual nature of SRI vs. conventional investments. According to Auer and Schuhmacher (2016), SRI investors seek financial but also nonfinancial utilities that are consistent with societal and personal values. Capelle-Blancard and Monjon (2014) talk about the "double dividend" since, as Managi et al. (2012) notice, SRI has a double objective: financial performance and social good. Humphrey and Tan (2014) consider this dual nature from the management point of view since nonfinancial information is incorporated in decision-making. Therefore, SRI could be defined as an investment process that has a potentially positive impact on sustainable development through the integration of not only financial concerns but also long-term ESG criteria into investment decisions (Escrig-Olmedo et al. 2017).

The literature shows how some factors favor the integration of SRI practices into the investment process, nevertheless Scholtens and Sievänen (2013) remark that the research about the key determinants of SRI is still limited.

Asset managers may, in turn, consider SRI practices into the investment process motivated by different types of drivers, which can be classified into business pressures –distinguishing between external pressures (e.g., societal pressures, future regulations or norms, industry trend and investor demand) and internal pressures (e.g., coherence with the strategy of the company and influence of internal stakeholders)–; corporate social responsibility (CSR) policy development and business structure.

External pressures –exerted by social movements– seem to be influencing economic systems (Arjaliès, 2010). In this context, societal pressures could be considered as an essential driver to integrate SRI practices into the investment process. These pressures took the form of client mandates in the 1970s when the Pax World fund that excluded companies profiting from the Vietnam War was created in the US (Renneboog et al. 2008). According to Puaschunder (2015), the societal demand for imbuing social responsibility in financial markets climaxed in the aftermath of the 2008 World Financial Crisis.

Currently, societal pressures have found an echo in differing national regulations and norms that the United Nations (UN) has attempted to harmonize with the UNPRI. This initiative encourages institutional investors to incorporate ESG issues into their investment practices (Sandberg et al. 2009). In their study of the drivers of SRI among Swedish Institutional Investors, Jansson et al. (2011) highlight that this supranational initiative has enforced the rapid increase in SRI assets under management in the last years. Scholtens and Sievänen (2013) see the growing number of UNPRI signatories as an indicator of the relevance of SRI for investors.

If societal pressures and their translation into regulations and norms could be considered as the drivers of emerging SRI practices, the academic literature has pondered about other factors that could explain their expansion and growth in recent decades. In their study for Arabesque and Oxford University, Clark et al. (2015) view sustainability as one of the most significant trends in financial markets for decades. This trend has made of SRI a global practice, in a more diverse market, encompassing different stakeholders (Bengtsson, 2008), among them retail and institutional investors, which have changed their personal and collective values according to the new market trends (Puaschunder, 2015). In this vein, Jansson et al. (2011) found that adoption of SRI may be influenced both by regulations and by the example of other investors (herding), a factor also mentioned by Juravle and Lewis, (2008). Moreover, Sandberg (2011) underlines the role of institutional investors not only as an actual determinant of SRI adoption but moreover as the key to the future growth of this type of investment. Among institutional investors, Lewis and Juravle (2010) explore the influence of human agency in the development of SRI, through interviews with so-called “SRI champions.”

Besides societal pressures, in the form of client mandates or regulations, and the market trends, embodied in institutional and retail demand, another strand of research has paid attention to “internal pressures”, in the form of strategic coherence and influence of internal stakeholders, as potential drivers to integrate SRI practices into the investment process.

It seems evident that the corporate strategy –which considers managers’ values and beliefs – should be integrated into all aspects of business operations and processes. In this sense, asset managers should manage their portfolios in coherence with the corporate strategy. Acting in coherence with the strategy of the companies has often been referred to as “doing well by doing good” (Statman, 2000) and regards the use of values to select investments as a source of competitive advantage (Berry and Junkus, 2013). Internal pressures relate with the business case of sustainability (Clark et al. 2015; Lewis and Juravle, 2010) since integrating ESG criteria

in the investment processes could lead to better financial outcomes by anticipating costs linked with poor performance in social, environmental and governance domains (Arjaliès, 2010).

However, a significant part of investors is still skeptical about the SRI approach (Kuzmina and Lindemane, 2017), so internal pressures could have operated for a time against ESG integration. The reasons are manifold. In their review of the academic and practitioner literature on responsible institutional investment, Juravle and Lewis (2008) argue that adopting SRI practices requires institutional investors to overcome three categories of obstacles: individual cognitive biases and belief systems more focused on short-term returns than long-term sustainability; organizational structures, processes and cultures suspicious of SRI; and institutional barriers. Lagoarde Segot (2018) points out that a deeper practice of sustainable investment is in contradiction with the positivist framework of finance as is currently practiced and understood. Sandberg (2013) points out that a narrow interpretation of fiduciary duty precludes a vast amount of institutional investors from doing anything that does not involve seeking maximum returns on investments. Woods (2009) considers this view of fiduciary duty as a way to mask the short-termism of many institutional investors.

Despite some efforts to dispel this interpretation of fiduciary duty, particularly after the Freshfields Bruckhaus Deringer report for UNEP (2005) for Kotsantonis et al. (2016), a restrictive consideration of fiduciary duty is one of the “myths” still working against ESG integration in the practices of many institutional investors. From their point of view, this interpretation is related to the fact that the most common sustainable investing practice is still negative screening. Since this practice represents a relatively low level of integration of ESG factors into investment processes, it does not ripe the direct or indirect material impact that a more in-depth integration could produce by improving the risk-return profile of investments.

In connection with business strategy, a long array of research has studied the relationship between SRI and CSR policy development. Early studies aimed to understand whether including CSR within a business strategy would improve economic performance (Revelli and Viviani, 2015). Margolis et al. (2007) and Orlitzky et al. (2003) have corroborated a positive relationship. Weber et al. (2014) link CSR to sustainability and define it as corporate self-regulation to manage sustainability risks and opportunities. For Moon (2007), CSR is, in essence, a form of self-regulation to contribute to social welfare. More recently, Bilbao-Terol et al. (2019) propose the integration of CSR valuations with the financial performance of companies in a unique measure of global sustainability performance.

Considering the nature of the relationship between CSR and SRI, it is essential to study if the adoption of formal CSR policies by the asset management companies contributes to the adoption of SRI advanced policies. In a previous study carried out by Balaguer et al. (2008), a positive relationship between fund management companies' internal policy on CSR and the fact that they manage and/or market SRI mutual funds was found.

Finally, some authors have paid attention to the "business structure" of asset management companies. In their study of impediments to SRI to become mainstream, Juravle and Lewis (2008) analyze the agency problem concerning the structure of modern corporations, in particular, the divorce of ownership from control. Despite that for some authors, many factors are contributing to the weakening of the agency logic (Cusumano et al. 2008), decision power has shifted from the shareholders (owners) to the corporate directors (agents) in modern corporations. This change made us ponder if independent asset management companies –where the divorce of ownership from control is not so evident– could favor the adoption of advanced SRI practices more than non-independent asset management companies, where the agency problem could persist.

Therefore, once reviewed the SRI drivers explored by previous research, three main categories of drivers could be identified:

- Business pressures: external pressures (societal pressures and market pressures) vs. internal pressures
- Business structure: ownership structure- independent vs. non-independent
- Business strategy: Formal CSR policy

However, in the current context, it seems necessary to analyze which ones could be more determinant in the asset management companies' decision to adopt advanced SRI practices helping, in this way, to the achievement of the SDGs and the transition towards low carbon economy.

2.2.2. SRI strategies

During the last years, the SRI industry has grown, and its sophistication has significantly increased such that distinct SRI strategies and SRI products can now be identified. Through SRI products, financial institutions have started to influence sustainable development through their core business (Weber et al. 2014). Institutional investors, especially those with long-term horizons, such as pension funds, play a major role in encouraging corporate directors to focus on long-term firm value (Busch et al. 2015) and to integrate ESG issues into the investment process.

The European SRI Study (2016) shows the last classification of SRI strategies. The seven strategies identified in the study are: (1) Exclusion of holdings from investment universe, (2) Best-in-class investment selection, (3) Norms-based screening, (4) Sustainability themed investments, (5) Integration of ESG factors in financial analysis, (6) Engagement and voting on sustainability matters, and (7) Impact investment. The evolution of these SRI strategies has been coupled in time to the development of SRI products, specifically socially responsible investment funds (SRI funds).

Following Renneboog et al. (2008), the oldest and most basic SRI strategy is negative screening, which excludes companies or sectors according to social, environmental, or ethical considerations. The construction of a portfolio of SRI funds, however, can also be based on positive screenings, i.e., selecting companies that efficiently comply with environmental, social, and good governance requirements. Positive filters are usually combined with a “best in class” approach, by which companies are scored according to their level of fulfillment of different ESG criteria. Sustainability themed investments involve the selection of assets that contribute to addressing sustainability challenges (e.g., climate change, energy efficiency, etc.) and could be a concrete example of a positive screening strategy. Another approach is shareholder activism as a way to exercise active ownership. It is a hybrid positive screening strategy because it allows putting pressure on companies with weak ESG results, and it allows rewarding those with better ones (Dawkins, 2018).

Institutional investors can exert their influence with engagement policies, usually a combination of proxy voting, shareholder resolutions and management dialogue (Clark et al. 2015). Studying the effects of active ownership, Dimson et al. (2015) discovered that successful engagements are followed by positive abnormal returns in the stock price of the companies and that, particularly on environmental and social issues; there is an improvement on accounting and governance performance and increased institutional ownership.

Since the launch of SDGs, impact investment strategies are becoming one of the major topics today for practitioners. The Global Impact Investment Network (GIIN) defines impact investments as investments made with the intention to generate positive, measurable, social, and environmental impact alongside a financial return (GIIN, 2018), focusing on issues related to sustainable development.

According to the Global Sustainable Investment Review (2018), the use of negative screening remains the dominant strategy in Europe at \$19.77 trillion. ESG integration is the second

biggest SRI approach, with over \$17.54 trillion in assets. Engagement and voting follow in terms of popularity, with over \$9.83 trillion in assets.

ESG integration is gaining ground in business, as well as in the operations that asset managers and owners conduct (Orsato et al. 2015). ESG integration is "*the explicit inclusion by asset managers of ESG risks and opportunities into traditional financial analysis and investment decisions based on a systematic process and appropriate research sources*" (Eurosif, 2016). The idea that integrating ESG factors into investment analysis and decision-making may offer investors potential long-term advantages in performance is gaining a general acceptance (Capelle-Blancard and Monjon, 2012; Dam and Scholtens, 2015; Friede et al. 2015).

Accordingly, the analysis of the integration of ESG factors in the portfolios is related to the first hypothesis of our study:

H1. There is a positive association between the integration of advanced SRI strategies into the portfolio construction and external pressures, independent ownership structure, and formal CSR policy.

According to Van Duren et al. (2016), ESG criteria are starting to be used even by conventional investors –mainly for red flagging and risk managing. Institutional investors have started to define frameworks and strategies for environmental issues and related risks showing an increase in awareness to assess climate-related financial risk (Breitenstein et al. 2021). This practice can be encouraged by the new European regulations and initiatives. For instance, the European Banking Authority (EBA) launches consultation until February 2021 to incorporate ESG risks into the governance, risk management, and supervision of credit institutions and investment firms. This practice underscores the relevance of evaluating extra-financial risks and their materiality Khan et al. (2015) when building investment portfolios. Seitanidi (2007) already have underlined the need for investors to prioritize intangible resources to protect their assets.

For SRI to thrive as an investment practice and make an accountable contribution to sustainability, it is vital to transcend the mere negative filters with more in-depth research that considers which ESG criteria and extra-financial risks could be more significant, given their economic impact, for each company candidate to integrate an investment portfolio (Eccles, 2015; Eccles and Serafeim, 2011, 2013).

Regarding the relevance of ESG risks, we thus hypothesize:

H2. There is a positive association between extra-financial risk management and external pressures, independent ownership structure, and formal CSR policy.

H3. There is a positive association between ESG risk integration in the portfolio construction/ measurement and external pressures, independent ownership structure, and formal CSR policy.

The complexity of some of the challenges the world is facing and their potential impact in the economic activities underscore the necessity of the asset management industry to become more sophisticated, not only from the perspective of better management of risks but also to be able to tackle the opportunities that this environment creates. This new scenario encourages asset management companies to apply a combination of SRI strategies (Ivanisevic, 2019).

Among the most advanced SRI strategies to face current global risks, we find engagement and voting on sustainability matters. Engagement with stakeholders has been studied most prominently from the Stakeholder Theory approach (Freeman, 1984), and it seems related to an efficient way to promote sustainability in companies (Clark and Hebb, 2005). The 2008 global financial crisis forced investors to pay more attention to democracy and responsibility in the markets (Banerjee, 2010). There has been a claim for greater transparency and accountability of market participants. Recently, the European second Shareholders' Rights Directive (SRD II) requires asset managers to disclose their engagement policy publicly. With this in mind, many asset managers employ an engagement strategy. Considering the critical roles of transparency and engagement in sustainable investments, we hypothesize:

H4. There is a positive association between higher level of information about ESG issues and external pressures, independent ownership structure, and formal CSR policy.

H5. There is a positive association between having Engagement policy and external pressures, independent ownership structure, and formal CSR policy.

Academic literature has focused much attention on the difference in returns of sustainable versus conventional investment (Revelli and Viviani, 2017). In the present context, given the urgency of the fight against climate change and the importance of achieving the SDGs, this discussion seems somewhat outdated. If different SRI strategies produce different outcomes in terms of sustainability (Folque et al., 2021), we aim to identify the main drivers to adopting advanced SRI practices in asset management companies.

According to the reviewed academic literature (Jansson et al. 2011; Renneboog et al. 2008; Sandberg et al. 2009), the six principles of UNPRI, and practitioner literature (Fulton et al. 2012, for Deutsche Bank Group DB Climate Change Advisors), a fund management company has adopted advanced SRI practices when it:

- adopts engaged and robust advanced SRI strategies (e.g., engagement and voting practices or impact investment) into the portfolio construction,
- measures sustainability risks of its portfolios, that is, any environmental, social or governance event that if it happens, could cause a negative impact on the value of the investment,
- follows transparency practices during the management and decision-making process of its portfolios and,
- has an engagement policy.

Our goal is to know why and which companies better advance the strengthening of SRI in the European financial market, and therefore, make a more significant contribution to climate change and sustainable development.

2.3. Methodology

2.3.1. Sampling and Data Collection

The information required for the study is based on an online self-administered survey sent both to asset management companies that already manage and/or market mutual funds in Europe. We have focused in Europe given its global leadership in SRI investing regarding assets under management, as shown in the analysis of the SRI market conducted by GSIA (2018).

The questionnaire for the study (available upon request) was made up of 42 questions and included seven sections: (1) characteristics of the asset management company; (2) CSR policy; (3) management and distribution of SRI funds; (4) SRI funds characteristics; (5) financial and extra-financial risks management; (6) communication with investors; and (7) engagement.

The content of the questionnaire is based on various sources, including the literature on ESG factors, such as Junkus and Berry (2015) review of critical issues of SRI, Berry and Junkus (2013) research on the investors' perspective about SRI, Balaguer et al. (2008) analysis of the role of fund management institutions in the development of SRI, and Koellner et al. (2005) analysis of the principles for sustainability rating of investment funds.

The questionnaire was designed in the spring of 2016. During the summer, it was tested by the team of SRI product specialists of an asset management company. We incorporated their

suggestions in September 2016 and programmed the final version to be sent in October 2016. Afterwards, a hyperlink to the questionnaire was emailed to heads of distribution of the most important asset managing companies around Europe. Of the total population of asset managing companies who manage or distribute their products in Europe, we identified the most important ones according to their volume under management and the number of European countries in which they distribute their products.

When targeting the potential respondents, we gave priority to those companies with the largest volume under management that distribute their products in more than two European countries. Finally, 95 questionnaires were sent between mid-October and December 2016. Initially, 41 questionnaires were filled out. After a follow-up email, this number increased to 45, resulting in a response rate of 47%.

Research using small sample sizes is not uncommon in this field of study. Van Duren et al. (2016) surveyed the opinions of portfolio managers concerning ESG integration among a group of 126 portfolio managers. Balaguer et al. (2008) explored the role of fund management institutions in the development of socially responsible investments with a sample of 47 asset management companies. Valor et al. (2009) targeted 99 representatives of financial rating agencies and fund managers to understand the demand for retail socially responsible investments. Jansson et al. (2011) surveyed 38 investment institutions to understand drivers of SRI in Sweden. In our study, the total volume of assets under management of the 45 respondents could compensate the size of the sample, since according to Morningstar Direct data from October 2017, it represents the third part of open funds domiciled in Europe, excluding Funds of funds (FOF) and Feeder funds.

The profile of the respondent belongs to an asset managing company domiciled in Europe, with transnational distribution in more than five countries, a generalist focus, and assets under management over €100 bn. Moreover, most of the respondents are companies that belong to banks, insurance companies, or financial groups. Finally, note that 67% of them have implemented corporate social responsibility formal policies, and 80% manage or market SRI funds. Definitions of the main characteristics of the sample are reported in Table 1.

Table 1. Profile of sample rates

Variables		Total sample (n=45)
Domicile of origin	USA	10%
	European Union	64%
	United Kingdom	13%
	Switzerland	11%
	Others	2%
Distribution	Domestic distribution only	18%
	Transnational. Fewer than three countries	9%
	Transnational. More than five countries	73%
Focus	Generalist	93%
	SRI Specialist	7%
Assets under management (AUM)	Up to 20 bn euros	38%
	20-50 bn euros	7%
	50-100 bn euros	13%
	More than 100 bn euros	42%
Ownership	Independent	38%
	Non independent	62%
CSR Policy	No	33%
	Yes	67%
SRI Funds	No	20%
	Yes	80%

2.3.2. Variable Description

Definitions and descriptive statistics of the independent and dependent variables are reported in Table 2. All variables are observed for year 2016.

Dependent variables depict what we have denominated determinants of advanced SRI practices, while independent variables are the possible drivers of such practices. We have grouped the different drivers into three big categories:

Business pressures: Considering the reasons to manage SRI funds provided by the asset managers different business pressures were identified:

- External pressures: societal pressures and market pressures

Societal pressures: international initiatives (UNPRI signatory) and clients' mandates

Market pressures: trends in the market and retail and institutional demand

- Internal pressures: coherence with the strategy of the company.

Business Structure: It is important to test whether the ownership of the company has an influence in the adoption of advanced practices. The companies in our sample are either

independent, or they belong to a bank, insurance company or financial group. We have labeled these three types as non-independent.

Business Strategy: Considering previous studies, it seems essential to analyze if the adoption of formal CSR policies by the asset management companies contributes to the adoption of SRI advanced policies. Most of the respondents in our sample declared to have a formal CSR policy.

Table 2. Definition of variables and descriptive statistics

Independent variables	Definition	Mean (SD)	Min-Max
Business pressures			
Societal Pressures	= 1 if the company admits societal pressures and 0 otherwise	0.80 (0.40)	0-1
Market Pressures	= 1 if the company admits market pressures and 0 otherwise	0.51 (0.50)	0-1
Internal Pressures	= 1 if the company admits internal pressures and 0 otherwise	0.33 (0.47)	0-1
Business structure			
Ownership structure	= 1 if the company is not independent and 0 otherwise	0.62 (0.49)	0-1
Business strategy			
CSR Policy	= 1 if the company has a written CSR policy and 0 otherwise	0.69 (0.46)	0-1
Dependent variable			
Integration of advanced SRI strategies*	= 1 for advanced strategies and 0 for non advanced	0.55 (0.49)	0-1
Extra-financial risks management**	= 1 if managed and 0 if not managed	0.6 (0.49)	0-1
ESG risks (environmental, social and governance risks) in the portfolio measured ²	= 1 if measured and 0 if not measured	0.53 (0.50)	0-1
Other extra-financial risks (e.g. legal risks, reputational risks,) in the portfolio measured	= 1 if measured and 0 if not measured	0.51 (0.50)	0-1
ESG issues info and disclosure	= 1 if frequent information and 0 if not frequent	0.64 (0.49)	0-1
Public Info	= 1 if public information and 0 if not public	0.57 (0.49)	0-1
Engagement policy	= 1 if the company has an engagement policy and 0 otherwise	0.64 (0.48)	0-1

* Following Renneboog et al. 2008, we have considered two types of SRI strategies: Advanced SRI strategies, that include positive screening, best in class, ESG integration, sustainability themed and engagement and voting, and non-advanced SRI strategies, that include negative screening, norms-based exclusion and sector-based exclusion.

** In the questionnaire, we distinguish between managing extra-financial risks, that is, considering them when composing the portfolios and effectively measuring ESG risks.

A majority of the asset management companies analysed are not independent and have a formal CSR policy. Moreover, most of them declare to manage extra-financial risk -while the

measurement of ESG risk is lower-, disclose information publicly and frequently, and have an engagement policy.

2.3.3. Empirical Design

To analyze the influence of the business structure, strategies and pressures to the asset managing industry we used a linear probability model, namely, the logistic regression model (Tabachnick and Fidell, 2007). Generally, logistic regression is well suited for describing and testing hypotheses about relationships between categorical outcomes variable and one or more categorical variables (Peng et al. 2002). Previous studies in this area have used multivariate regression as the main method for the modeling and discrimination problems (Escrig-Olmedo et al. 2013; Cooper and Weber, 2020)

With logistic regressions is possible to handle dichotomous outcomes without having to meet strict statistical assumptions, i.e., linearity, normality, and continuity for OLS regression and multivariate normality with equal variances and covariances of discriminant analysis (Lei and Koehly, 2003).

Based on the type of dependent variable analysed in our study, we have opted for multivariate binary logistic regression, used when the dependent variable has two categories. Since the outcome is dichotomous, predicting unit change as in regular linear regressions has little meaning. As an alternative to modelling the value of the outcome, logistic regression focuses instead upon the relative probability (odds) of obtaining a given result category (Guido et al. 2006)

A logistic regression will model the chance of an outcome. Because chance is a ratio, what is actually modeled is the logarithm of the chance given by:

$$\text{Log} \frac{p}{(1-p)} = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_m x_m$$

Where p indicates the probability of an event, β are the regression coefficients associated with the reference group and the x are the explanatory variables.

The results of our analysis are in the form of an odds ratio and Wald test. For logistic regression with a dichotomous independent the odds ratio is a measure of association that approximates how much more likely or unlikely it is for the outcome to be present among those with $x=1$ than among with $x=0$ (Hosmer and Lemenshow, 2000). The predicted odds ratio is presented in the column 'Exp(B)'. The statistical significance of individual regression coefficients (i.e., β s) of each independent variable is tested using the Wald chi-square statistic

and are given in the column ‘Wald’. The *p*-values for the test statistics for each individual predictor are given in the column ‘Sig’.

2.4. Findings

This section first shows the results of logistic regressions, and then discusses the main findings.

With regard to the integration of advanced SRI strategies into the portfolio construction (Table 3) we found that societal pressures and market pressures are statistically significant explanatory factors.

Table 3. Test for H1: Advanced SRI Strategies

Dependent Variable:					
Advanced SRI					
Strategies	B	E.T.	Wald	Sig.	Exp (B)
Ownership	0,693	0,760	0,832	0,362	2,001
CSR Policy	0,147	0,828	0,032	0,859	1,159
Internal Pressures	0,210	0,856	0,060	0,806	1,234
Societal Pressures	2,550	1,126	5,129	0,024**	12,810
Market Pressures	-1,681	0,806	4,351	0,037**	0,186
Constant	-0,443	0,914	0,235	0,628	0,642

****p* < 0.01; ***p* < 0.05; **p* < 0.10

The variable “societal pressures” has a positive and statistically significant impact (*p* < 0.05) on the adoption of advanced SRI strategies. Societal pressures are part of what we have considered as external pressures along with market pressures. Societal pressures comprise being a signatory of UNPRI and/or clients’ mandates. Therefore, if an asset management company of our sample is a signatory of UNPRI or has clients’ mandates is 12 times more likely to adopt advanced SRI strategies, according to the odds ratio. However, the variable “market pressures-that includes retail and institutional demand and the appearance of new trends in the financial markets-, is significantly (*p* < 0.05) and negatively related to the integration of advanced SRI strategies, contrary to what we were expecting. The rest of the independent variables have no statistically significant explanatory power in explaining the adoption of advanced SRI strategies. Therefore, H1 could be partially accepted.

As shown in Table 4, which asset management companies manage extra-financial risk could be due to societal pressures.

Table 4. Test for H4: Management of extra-financial risks

Dependent Variable:					
Management of extra-financial risks					
	B	E.T.	Wald	Sig.	Exp (B)
Ownership	0,727	0,750	0,940	0,332	2,069
CSR Policy	0,552	0,858	0,413	0,520	1,736
Internal Pressures	-0,529	0,831	0,405	0,525	0,589
Societal Pressures	2,787	1,230	5,132	0,023**	16,232
Market Pressures	-0,367	0,772	0,227	0,634	0,693
Constant	-2,324	1,349	2,969	0,085	0,098

***p < 0.01; **p < 0.05; *p < 0.10

The variable “societal pressures” appears positively and significantly ($p < 0.05$) correlated with the management of extra-financial risks. Therefore, if an asset management company of our sample is a signatory of UNPRI or has clients’ mandates is 16 times more likely to manage extra-financial risks, according to the odd ratio. The rest of the independent variables do not seem to be significantly related to the dependent variable. Therefore, H2 is partially accepted. Going deeper into this aspect, Table 5 shows whether the incorporation of ESG risks or other specific extra-financial risks (legal risks, reputational risks, or sectorial risks) in the construction of portfolios and their measurement depends on business pressures, business structure or business strategy.

Table 5. Test for H3: Integration in the portfolio construction and measurement of ESG and other specific extra-financial risks

Dependent Variable:					
Measurement of ESG and other specific extra-financial risks					
	B	E.T.	Wald	Sig.	Exp (B)
ESG Risks					
Ownership	0,526	0,712	0,546	0,460	1,692
CSR Policy	0,824	0,829	0,989	0,320	2,279
Internal Pressures	-0,635	0,794	0,639	0,424	0,530
Societal Pressures	2,205	1,205	3,352	0,067*	9,073
Market Pressures	-0,616	0,734	0,705	0,401	0,540
Constant	-2,081	1,316	2,500	0,114	0,125
Other specific extra-financial risks					
Ownership	0,172	0,711	0,058	0,809	1,188
CSR Policy	1,340	0,852	2,472	0,116	3,817
Internal Pressures	0,065	0,795	0,007	0,934	1,068
Societal Pressures	1,851	1,206	2,358	0,125	6,369
Market Pressures	-0,673	0,731	0,846	0,358	0,510
Constant	-2,238	1,317	2,889	0,089	0,107

***p < 0.01; **p < 0.05; *p < 0.10

It appears that none of the independent variables proposed is statistically significantly related to the measurement of extra-financial risks. Marginally significant ($p < 0.10$) does exist between societal pressures and the measurement and integration of ESG risks in portfolio construction. Therefore, H3 cannot be accepted for these data.

Regarding the drivers that foster fund asset management companies to offer frequent and public information about ESG issues to their investors (Table 6), the results confirm those fund management companies that have a formal CSR policy defined are more likely to offer public and frequent information.

Table 6. Test for H4: Information frequency and public disclosure

Dependent Variable: Info frequency and public disclosure					
	B	E.T.	Wald	Sig.	Exp (B)
Public disclosure					
Ownership	0,057	0,864	0,004	0,948	1,058
CSR Policy	3,321	1,274	6,802	0,009***	27,699
Internal Pressures	0,608	1,049	0,335	0,563	1,836
Societal Pressures	1,808	1,272	2,019	0,155	6,096
Market Pressures	-2,174	1,162	3,502	0,061*	0,114
Constant	-2,430	1,447	2,820	0,093	0,088
Frequent Information					
Ownership	0,436	0,948	0,211	0,646	1,546
CSR Policy	3,028	1,200	6,370	0,011**	20,653
Internal Pressures	1,190	1,340	0,788	0,375	3,287
Societal Pressures	2,833	1,376	4,235	0,039**	16,989
Market Pressures	-1,968	1,250	2,480	0,115	0,140
Constant	-2,970	1,645	3,257	0,071	0,051

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$

A formal CSR policy has a positive and statistically significant impact ($p < 0.01$) on both offering frequent information and its public disclosure, while societal pressures also show the same kind of relationship with offering frequent information ($p < 0.05$). The odd ratios indicate that asset management companies with a formal CSR policy are 20 times more likely to offer frequent information about ESG issues and 27 times to disclose it publicly. Moreover, the companies that admit societal pressures are 16 times more likely to offer frequent information. A certain degree of relationship ($p < 0.10$) though negative, does exist between market pressures and the public disclosure of the information. Therefore, H4 is partially accepted. This

finding confirms the importance of communication for the development of advanced SRI strategies.

Finally, Table 7 displays the logistic regression analysis to understand the main drivers for having a formal engagement policy defined. The variables “formal CSR policy” ($p < 0.01$) and “societal pressures” ($p < 0.05$) have a positive and statistically significant impact on having a formal engagement policy. Therefore, H5 is partially accepted.

Table 7. Test for H5: Engagement

Dependent Variable:					
Engagement	B	E.T.	Wald	Sig.	Exp (B)
Ownership	-0,435	0,909	0,229	0,633	0,648
CSR Policy	2,614	1,005	6,764	0,009***	13,648
Internal Pressures	1,631	1,380	1,398	0,237	5,109
Societal Pressures	2,883	1,355	4,522	0,033**	17,859
Market Pressures	-0,750	1,007	0,555	0,456	0,472
Constant	-2,770	1,598	3,005	0,083	0,063

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$

To sum up (see Table 8), H3 is not accepted for these data, and H1, H2, H4, and H5 are partially accepted. The variables with more explanatory power are “societal pressures” and having a “formal CSR policy.” “Societal pressures” is positively and statistically significant in H1, H2, H4, and H5 and has a certain degree of positive relationship ($p < 0.10$) to the dependent variable in H3, and “formal CSR policy” is positively and statistically significant in H4 and H5.

We have also found that the variable “market pressures,” which is part of what we have called external pressures, has a negative statistically significant relationship to the adoption of advanced SRI strategies (H1) and to the public disclosure of information (H4). The sign of the relationship is the opposite of what we were expecting. Both variables show a negative Pearson correlation (-0,249).

This outcome comes as a surprise given the relevance that recent literature has given to the market pressures in the form of institutional and/or retail demand (Sandberg, 2011) and the strength of the market trend as potential drivers of SRI expansion. This result may be explained if we consider that indeed market pressures are contributing to the growth of SRI, but not necessarily yet to the adoption of more advanced and sophisticated strategies. Therefore, at the moment of our inquiry, the clients’ mandates and being a signatory of UNPRI,

the determinants of the variable “societal pressures” are more relevant as drivers to explain the adoption of advanced SRI strategies than the retail and institutional demand.

The two other explanatory variables, “independent ownership” and “internal pressures”, do not have a significant relationship with the dependent variables in any of the Hypotheses. Therefore, neither the business structure or the coherence with the strategy of the company seem to be relevant to explain any of the dependent variables that define the advanced SRI practices, contrary to what we were expecting considering previous literature (Berry and Junkus, 2013).

Concretely, we also hypothesized that an independent structure of the ownership of the company could be relevant to explain the adoption of SRI advanced strategies. Independent asset management companies could be more open to innovation without the pressure of prominent business structures and are not that exposed to the so-called agency problem (Juravle and Lewis, 2008). However, the results in our sample are inconclusive. The same happens with the variable “internal pressures”, defined as “coherence with the strategy of the company”.

Given the skeptical attitude of part of the asset management industry towards SRI practices, regarding the risk-return profiles in light of a classic interpretation of the fiduciary duty, we proposed a negative impact in the adoption of SRI advanced practices. In one of the hypotheses (H2, management of extra-financial risks) its beta shows a negative sign as we have expected. Therefore, the variable “internal pressures” does not seem to be relevant in our sample.

Table 8: Hypotheses

Dependent variable	Independent variables	Hypothesis	Nature of the relationship
Integration of advanced SRI strategies	Ownership structure, CSR Policy, Societal Pressures, Market Pressures, Internal Pressures	H1. Integrating advanced SRI strategies into the portfolio construction is positively associated with external pressures, independent ownership structure, and formal CSR policy; and negatively associated with internal pressures and non-independent ownership structure.	H1 shows a positive relationship with societal pressures and a negative relationship with market pressures
Extra-financial risks management	Ownership structure, CSR Policy, Societal Pressures, Market Pressures, Internal Pressures	H2. Extra-financial risk management is positively associated with external pressures, independent ownership structure, and formal CSR policy; and negatively associated with internal pressures and non-independent ownership structure.	H2 shows a positive relationship with societal pressures
ESG risks measured	Ownership structure, CSR Policy, Societal Pressures, Market Pressures, Internal Pressures	H3. ESG risk integration in the portfolio construction and their measurement is positively associated with external pressures, independent ownership structure, and formal CSR policy; and negatively associated with internal pressures and non-independent ownership structure.	None
ESG issues info and disclosure	Ownership structure, CSR Policy, Societal Pressures, Market Pressures, Internal Pressures	H4. A higher level of information about ESG issues is positively associated with external pressures, independent ownership structure, and formal CSR policy; and negatively associated with internal pressures and non-independent ownership structure.	H4 shows a positive relationship with societal pressures and CSR policy and a negative relationship with market pressures
Engagement policy	Ownership structure, CSR Policy, Societal Pressures, Market Pressures, Internal Pressures	H5. Having Engagement policy is positively associated with external pressures, independent ownership structure, and formal CSR policy; and negatively associated with internal pressures and non-independent ownership structure.	H5 shows a positive relationship with societal pressures and CSR policy

2.5. Discussion and Concluding Remarks

SRI has experienced impressive growth in the last two decades; however, the adoption of advanced SRI strategies has not kept pace with it in terms of its potential impact on sustainability. If we consider the scope, magnitude and urgency of the challenges included in the UN Sustainable Development Goals (SDGs) global agenda, the asset management industry would contribute to sustainability to a higher degree by adopting more sophisticated strategies, with effective integration of ESG criteria in their portfolios. Our aim with this study is to contribute to a better understanding of the factors driving the adoption of advanced SRI strategies in the European Asset Management Industry, which will help the European financial market integrate sustainable finance into the mainstream.

This study presents empirical evidence from a survey of 45 fund management companies that manage and/or distribute investment funds in Europe to address the following question: Which factors (internal or external) to the asset management companies can be considered as drivers for the adoption of advanced SRI practices by the European asset management industry?

The results show that having a formal CSR policy and the societal pressures are the main drivers for the adoption of advanced SRI practices. Therefore, they underline how critical it is for the fund management industry to be open to societal demands and concerns, contributing to a more sustainable model of growth and adopting a formal CSR policy that explicitly guides this commitment.

The above findings confirm what has been stated in part of the extant literature (Arjaliés, 2010; Jansson et al. 2011; Puaschunder, 2015). Societal pressures were the original force beyond the creation of the first SRI funds, and their relevance does not seem to be fading. These pressures, translated currently in legislative changes (European Commission Action Plan (2018)), international initiatives like the UNPRI, and the direct client mandates, are driving SRI practices towards a deeper level of ESG criteria integration in Europe. However, this research goes further and shows that social pressures are really a driving factor in three critical areas within the asset management industry: (1) for the integration of advanced SRI strategies, (2) for the integration and measurement of ESG risks, and (3) for the definition of engagement policies. This highlights the need, on the one hand, for regulators to support adequate lines of action for the financial industry for the integration of advanced SRI strategies and, on the other hand, for asset managers to fully understand international sustainability initiatives and participate in their development. It will help bring sustainable finance into mainstream creating a sustainable financing market that helps achieve the climate and sustainable development goals.

Societal pressures (regulatory changes and international initiatives) have led to a change in the type of investment strategies where advanced SRI practices, such as the integration of ESG risks, seem essential for the design of investment products that help achieve the SDGs. This influence is now reflected in the Sustainable Finance Disclosure Regulation (SFDR, 2021), the new European regulation on disclosure and classification of financial products. SFDR distinguishes between Article 6 products that take into account financially material sustainability / ESG risks but do not necessarily affect the portfolio construction, Article 8 products that promote sustainable, environmental, or social characteristics, and Article 9 ones, that have the explicit objective of having a positive and measurable impact on environmental or social issues.

We have also seen confirmed the relationship between CSR and SRI. Previous studies show that CSR is a driver of SRI (Balaguer et al. 2008). However, this research delves into this aspect and shows that it is specifically a driver for the integration and measurement of ESG risks and the definition of engagement policies. Therefore, given this fact, asset managers should make efforts to define a formal CSR policy that allows the integration of advanced SRI practices into the European asset management industry.

A fund management company adopts advanced SRI practices when (1) integrates engaged and robust advanced SRI strategies into the portfolio construction, (2) manages sustainability risks in its portfolios, (3) follows transparency practices during the management and decision-making process of its portfolios and (4) has an engagement policy. Considering these aspects will allow the creation of new sustainable financial products within this framework.

Other findings may result at least surprising since in our sample the variable market pressures, that comprises institutional and retail demand and the need to follow the market trend, shows a negative relationship with the adoption of SRI advanced strategies, contrary to what we were expecting and to what part of the literature states (Sandberg, 2011). It appears that market pressures have contributed to SRI growth, but maybe they are not yet driving in a significant way the evolution of SRI practices into a more in-depth commitment to sustainability. A possible development remains to be seen and merits further research.

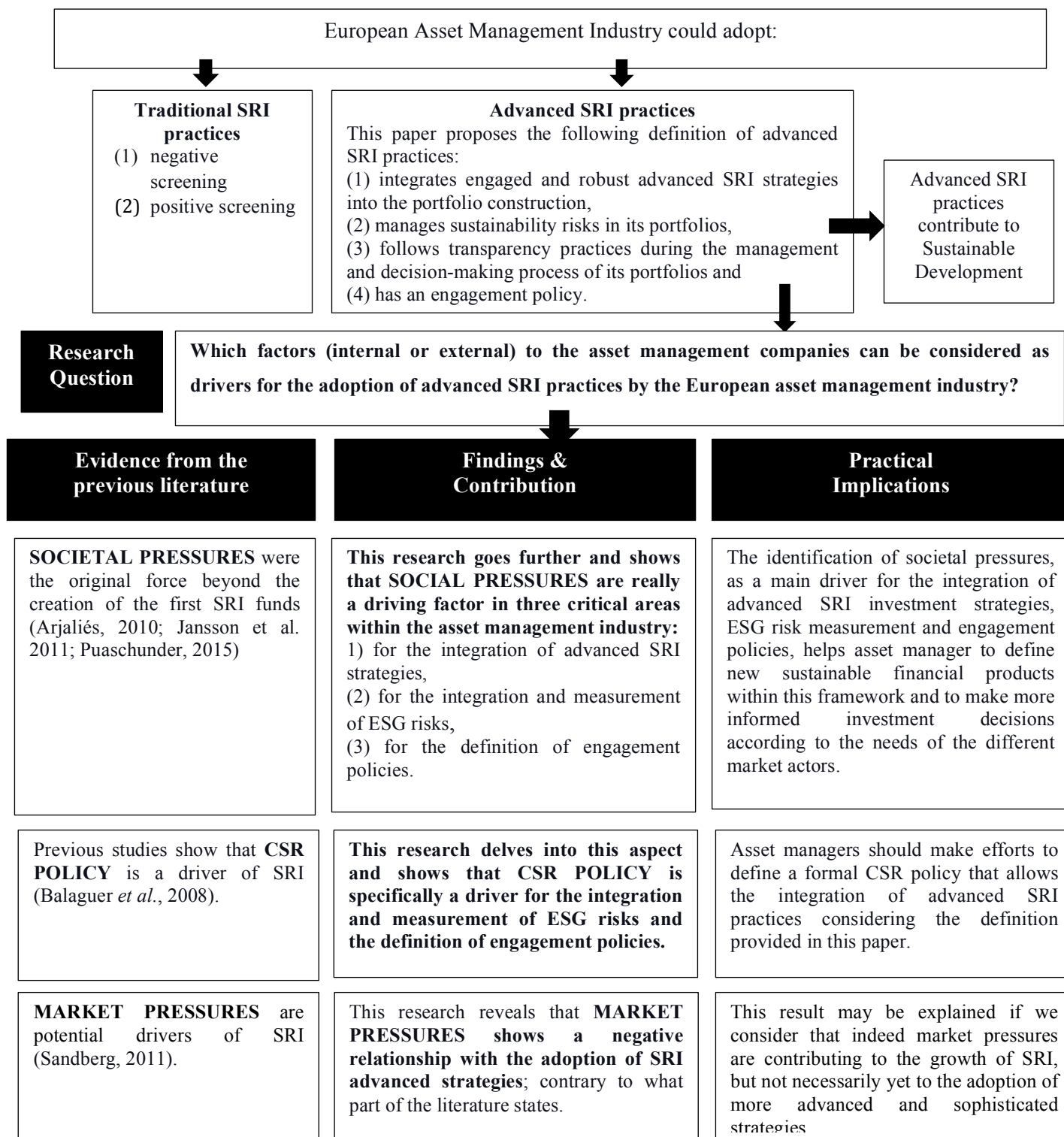
This research is of potential importance for academics and the financial market. On the one hand, the study offers a threefold contribution to responsible investment literature. First, this study contributes to the academic debate on the motivations of the fund management industry to adopt ESG criteria more effective integration. Second, a comprehensive overview of SRI practices used in the financial market is presented. Third, a clear definition of advanced SRI strategies is provided.

On the other hand, it may also be useful for asset management companies. First, this research helps to increase the awareness of the crucial importance of moving forward in the practice of SRI. Second, the identification of the main drivers of the integration of advanced SRI practices in asset management companies will allow them to design investment products and to make more informed investment decisions according to the needs of the different market actors. Finally, the results help bring sustainable finance into the mainstream.

The method employed in this study could have limitations. Although representative of an important proportion of the assets under management in Europe, our sample is composed of only 45 respondents, which can make our results less generalizable. Second, even if it includes

companies from other continents, it is focused on Europe. Thus, future research in advanced SRI practices should focus on different markets and players. Moreover, it could be interesting to carry out this study in the current context to analyze the incidence of Covid-19 as a driving factor of SRI and new models for measuring extra-financial risks.

Figure 1: Contribution to SRI literature and practical implications



Chapter Three

SUSTAINABLE DEVELOPMENT AND FINANCIAL SYSTEM: INTEGRATING ESG RISKS THROUGH SUSTAINABLE INVESTMENT STRATEGIES IN A CLIMATE CHANGE CONTEXT

Sustainable Investment funds are one of the most appropriate ways for the financial system to contribute to sustainable development. However, the effective contribution of Sustainable Investment funds can vary widely depending on their management strategy. This paper aims to analyze which strategies or combinations of them allow practitioners to better manage ESG risks in ESG portfolios within a complete framework consistent with global challenges that focus on sustainability and carbon risk scores. To analyze the differences between Sustainable Investment strategies, we adopt a parametric ANOVA method. We find that, on average, funds that only apply negative filters achieve worse ESG risk scores and show worse carbon risk. In sum, this study contributes with more in-depth knowledge about the different outcomes in terms of sustainability risks of the different SI strategies.

3.1. Introduction

The global sustainability agenda, the mitigation of climate change, and the transition towards a low carbon economy have become permanent features for investors. The opportunities and risks of this scenario require the comprehensive measurement of both financial and sustainability risks in investment portfolios. Financial risks are already integrated into investment processes, but effective risk management should also consider environmental, social, and governance (ESG) risks (Ashwin Kumar et al., 2016; Hübel & Scholz, 2020).

Nowadays, more and more investors rely on ESG rating providers to measure these risks. These third-party data providers assess firms' ESG performance (Berg et al., 2019), offer ESG metrics as a proxy for sustainability performance (Widyawati, 2020), and have become a key reference in financial markets (Escrig-Olmedo et al., 2019). ESG scores' strengths and shortcomings are increasingly becoming the subject of interest for academia and practitioners. While some authors have warned that performance and risk are different constructs (Semenova & Hassel, 2015) and others, have put in question the rigorousness of ESG rating agencies' evaluation of corporate sustainability risks (Boiral et al., 2020), some ESG rating providers are changing their focus to identify financially material ESG-related risks, in line with the role that sustainable investment (SI) could play in the transition economy.

Among the metrics analyzed, exposure to carbon and climate risks is gaining relevance amidst the climate change transition of the economy (Görge et al., 2017). The awareness of climate change impact has already led some institutional investors to reconsider holdings with significant ties to fossil fuels or at least to price in the externalities of fossil fuel consumption (Ibikunle & Steffen, 2017). Some of them have also considered creating and joining in international initiatives such as Climate Action 100, the Carbon Disclosure Project, the Portfolio Decarbonization Project, or the Global Investor Coalition on Climate Change, among others (Krüger et al. 2018). In sum, many more investors are becoming sensitive to how companies in which they invest perform sustainably (Bradford et al. 2017), looking for additional utility by investing in sustainable companies (Hirschberger et al. 2012), following what Bollen (2007) coined as the multi-attribute utility function of socially responsible investors.

Thus, investors' attitudes have changed, and so have the measurement and integration of ESG risks in the investment processes of mutual funds. Diverse approaches deployed in different strategies usually coexist in investment portfolios. Negative and positive filters of specific industries and activities were the starting approach to build sustainable portfolios. They are still applied, but now they coexist with evolved strategies like integration, engagement, and impact investment. The aggregation of different practices is common in the asset management industry.

While academic literature on SI has mainly focused on comparing its financial performance to conventional investments (Capelle-Blancard & Monjon, 2012; von Wallis & Klein, 2015), much less attention has been paid to the effects that applying different SI strategies could have on effectively managing ESG risks. Different practices of SI can achieve different results (Silva & Cortez, 2016; Nofsinger & Varma, 2014), and given the urgency of the societal and economic challenges that climate change and the sustainability agenda pose more in-depth research is required. An analysis that goes beyond the financial performance of SI funds versus their conventional peers, to focus on sustainability and carbon risks. If SI is an investment approach that has a potentially positive impact on sustainable development through the integration of not only financial concerns but also long-term ESG criteria into investment decisions (Escrig-Olmedo et al., 2017), it seems relevant to test its sustainability and environmental contributions. It is also pertinent to analyze which SI strategies or combination of strategies exhibit lower ESG risks.

For this reason, in contrast to previous literature, the objective of this paper is to study which strategies or combination of SI strategies allow practitioners a better management of ESG risks in ESG portfolios within a complete framework consistent with global challenges that consider sustainability and carbon risk scores. Concretely, the current study addresses the following research question: Which SI strategy achieves the lowest impact of ESG risks on their investment, and therefore facilitates the integration of sustainability into the financial market contributing to sustainable development?

To answer this research question, we propose an empirical analysis focused on equity SI mutual funds registered for sale in Europe. Our study is focused in Europe because it is the region in the world with more SI assets under management and where is finding more support and impulse in the legislative agenda (GSIA 2019; Eurosif 2018). To gather data on SI Funds, we have used Morningstar Direct database based on Sustainalytics' research, leading information providers in the mutual fund industry. Following Berg et al. (2019), we explain the choice of Morningstar data given the change of methodology announced in 2018, when the ESG data provider shifted from measuring ESG performance to measure ESG risks, including carbon risk. Sustainability risks are the subject of our interest and analysis. Furthermore, as Ammann et al. (2019) show, Morningstar is one of the most influential databases in the market regarding sustainability data, given its ability to reach both institutional and retail investors.

Based on our analysis, we find that, on average, funds that only apply negative filters, achieve a worse ESG risk in terms of Historical Sustainability Score and Portfolio Social Score compared to the funds that integrate more advanced SI strategies (ESG integration, screening combination, engagement and impact investment). The funds that only apply negative filters also show worse carbon risk score.

We contribute to the asset management literature by achieving a more profound knowledge about the different outcomes of the different SI strategies, not only attending to financial performance but widening the focus to global sustainability risks and carbon risk score. In the current global context, adequate analysis and measurement of ESG risks by the financial market seem essential to contribute to the Global Sustainability Agenda and mitigate climate change. Portfolio managers should integrate into their analysis these new components of risk, in addition to the traditional financial risks. This paper's results provide managers and selectors the skills necessary to choose the SI funds that best meet ESG and carbon risks.

The remainder of the paper is organized as follows: Section 2 reviews the relevant literature and states the main hypotheses to be tested. Section 3 describes the methodology, including

the econometric model, data, and study variables. Section 4 presents the empirical results and discussion. Finally, Section 5 concludes the study.

3.2. Theoretical Framework and hypotheses formulation

3.2.1. Sustainability risks and SI funds

The overall goal of sustainable development is the long-term stability of the society's needs and the environment, and to achieve this, the financial sector should contribute to a greener and more sustainable economic development. Busch et al. (2015) explored the role of financial markets for sustainable development, suggesting that a reorientation toward a long-term paradigm for sustainable investments is essential.

Financial institutions have started to influence sustainable development through their core business with SI products (Weber et al., 2011). Institutional investors –the major players in the world's financial markets (Sandberg, 2011)– have the opportunity to be an integral part of the global sustainability agenda, integrating sustainability risks into the investment decision-making process through SI. A sustainability risk means “an environmental, social or governance event or condition that, if it occurs, could cause a negative material impact on the value of the investment” (EC, 2019). The consideration of sustainability risks associated with social, environmental, and governance issues (also called ESG risks), has increased among investors (Boiral et al., 2020; Henriksson et al., 2019).

In line with this growing interest, more recently, a branch of academic literature has been focusing on the challenges of assessing sustainability risks given their unpredictability, the methodological issues related to their measurement, and the lack of reliable information (Boiral et al., 2020). Since more and more investors rely on ESG ratings from third-party providers, authors have analyzed the lack of homogeneity of their measurements (Saadaoui & Soobaroyen, 2018), the sources of these disagreements (Berg et al., 2019), the effects of these disagreements on stock returns (Gibson et al., 2020), the differences between measuring performance and risks (Semenova & Hassel, 2015) and how to overcome the shortcomings of ESG ratings with alternative measurements of exposure (Henriksson et al., 2019; Hübel & Scholz, 2020). From another perspective, some authors have shown that a portfolio's sustainability quality can be improved using ESG scores without hampering performance or diversification (Alessandrini & Jondeau, 2020). Others emphasize that the growth of socially responsible investing and ESG would not have been possible without the research now available from Morningstar and other ESG ratings (Townsend, 2020).

Academic literature on SI is broadening the scope of its attention to transcend the exhausted discussion (Juravle & Lewis, 2008) of the difference of performance between SI and conventional investments, paying more attention to ESG risk considerations and ESG risk metrics (Widyawati, 2020). According to Van Duren et al. (2016), ESG criteria are starting to be used even by conventional investors –mainly for red-flagging and risk managing. In a previous study on the motives to engage in sustainable investment, Jansson & Biel (2011) found that institutional investors were prompted by an effort to reduce financial risks. This practice underscores the relevance of evaluating sustainability risks and their materiality when building investment portfolios (GIIN, 2018).

Analyzing the effects of integrating ESG considerations/attributes on portfolio risks, a study of the Spanish market, Ortas et al. (2014) find that SI strategies are less risky, in terms of risk-adjusted returns, than the conventional investment approach. Moreover, the lower riskiness of the SI seems more evident during periods of maximum market instability. Analyzing a sample of US domestic equity funds, Nofsinger & Varma (2014) encounter evidence of outperformance of SI funds compared to conventional peers during periods of market crisis, but this lower downside risk comes at the cost of underperforming in non-crisis periods. They explain this asymmetric return by the very nature of SI and ESG that offers protection against adverse events during both bull and bear markets. Ashwin Kumar et al. (2016) study the correlation between ESG performance, and stock returns volatility to find that integrating ESG factors into the investment decision can bring lower volatility, achieve superior risk-adjusted returns, and more efficiency, measured by higher Sharpe ratios.

However, considering the risk of SI portfolios in terms of volatility and financial ratios is not the same as analyzing the sustainability risks of the SI portfolios, and different approaches to SI portfolio construction can have different impacts on sustainability (Kölbel et al., 2019).

3.2.2. Sustainability risks and SI strategies

SI funds may integrate non-financial considerations into the investment process by applying a set of investment screens designed to select (positive screens) or to exclude (negative screens) assets from their portfolios (Leite & Cortez, 2014). Negative screening is considered the oldest SI practice (Renneboog et al. 2008; Trinks & Scholtens, 2017) and excludes companies or sectors according to social, environmental, or ethical considerations. However, the construction of a portfolio in SI funds can also be based on a positive screening approach to select investments that meet specific standards or reflect beneficial initiatives (Gangi &

Varrone, 2018). Positive filters are usually combined with a "best in class" approach, by which companies are scored according to their level of fulfillment of different ESG criteria.

Renneboog et al. (2008) view the negative and positive screening of filtering as the first and second generation of SI funds. The third generation of SI refers to an integrated approach of selecting companies based on the economic, environmental, and social criteria comprised of both negative and positive screens. ESG integration is "the explicit inclusion by asset managers of ESG risks and opportunities into traditional financial analysis and investment decisions based on a systematic process and appropriate research sources" (Eurosif, 2016). The fourth generation of SI funds combines the third generation with shareholder activism. In recent years, particularly with the launch of the SDG's, another sustainable investment practice, impact investing, is gaining ground. The Global Impact Investment Network (GIIN) defines impact investments as investments made with the intention to generate positive, measurable social, and environmental impact alongside a financial return (GIIN, 2018), focusing on issues related to sustainable development (water, fight against climate change, health, education, etc.). The intentionality and the measurability are crucial elements of this practice, and investors can incorporate impact investing across asset classes and with a variety of return expectations. This investment approach's particular characteristics have led many to consider it a crucial practice for many to achieve the SDGs, highlighting its role in closing the SDG funding gap (Carè & Wendt, 2018).

The Global Sustainable Investment Alliance -GSIA- (2019) and Eurosif (2018) have classified these screenings, and combination of approaches in seven different strategies: (1) Sustainability themed investments, (2) Best-in-class investment selection, (2) Exclusion of holdings from investment universe, (4) Norms-based screening, (5) Integration of ESG factors in financial analysis, (6) Engagement and voting on sustainability matters, and (7) Impact investment. SI Funds can combine any number of these strategies to create an overall strategy.

The literature on SI practices has examined in depth the relation between screens and the financial performance of SI funds. Focusing on how it relates to the intensity and types of screens used, Barnett and Salomon (2006) and Capelle-Blancard & Monjon (2014) find a curvilinear relationship. Admitting that the use of different screens can lead to different performance patterns and investment styles, Trinks & Scholtens (2017) find that the use of negative screening is financially suboptimal due to the opportunity costs. Kempf & Osthoff (2007) show that in a trading strategy, the maximum abnormal returns are reached when

investors employ the best-in-class screening approach. Analyzing this approach, Leite & Cortez (2014) show that best in class may create difficulties in distinguishing SI from non-SI funds.

Bauer et al. (2003) had already argued that by using only a best-in-class approach, the fund manager could choose the least controversial company in any sector, allowing investments in leading companies from industries that are often considered undesirable from a socially responsible perspective. Other practices have received critics on their sustainability focus, particularly the ESG integration, considered as a “less restrictive SI” by Revelli (2017).

According to the GSIA (2019), the most common way to participate in sustainable investing (as measured by assets under management allocated to each strategy) is to implement negative screening. However, this approach is closely followed by ESG integration and corporate engagement strategies. Some authors have linked this evolution to the popularization of ESG data and ratings (Drei et al., 2020). ESG data is now more widely available than even five years ago, changing sustainable investment practices. The dynamics of ESG ratings shape the evolution of sustainable investment to the point where simple negative screening is considered an outdated or non-advanced practice (Townsend, 2020) versus forward-looking ESG analysis, which strives to assess the materiality of nontraditional data to determine which companies are best fit to face sustainability risks. Therefore, more advanced SI strategies (for example integration, engagement & voting, impact investment, among others) are gaining ground (Eurosif, 2018), allowing the creation of asset portfolios advanced in ESG matters. In this line and based on their research, Alessandrini & Jondeau (2020) suggest that ESG investing is fundamentally different from screening out sin stocks.

Surprisingly, there are very few academic studies that compare the ESG performance of SI funds according to their sustainability characteristics (ESG attributes). Matallín-Sáez et al. (2019) compare the performance of SI funds to the level of sustainability attributes accomplished in their portfolio. These characteristics refer to ESG scores. According to this study, funds with high ESG scores seem to experience overall worse performances. This evidence is, however, mainly driven by the behavior of the worst-performing funds. In a study on how SI investors can trigger changes in companies' environmental and social impact, Kolbel et al. (2019) concluded that the impact of shareholder engagement is well supported in the literature, while the impact of capital allocation is only partially supported.

The recent creation of the tools to measure companies and issuers' extra-financial data can explain the lack of studies analyzing the relationship between SI strategies and ESG risks in SI

funds. Hence, it is vital to implement more in-depth research that considers which SI strategies and ESG risks could be more significant for SI to thrive as an investment practice and make an accountable contribution to sustainability (Eccles, 2015; Eccles & Serafeim, 2011, 2013).

Accordingly, the analysis of the ESG risks is related to the first hypothesis of our study:

Hypothesis 1. Funds with advanced SI strategies exhibit lower ESG risks.

3.2.3. Climate risk and financial sector

Limiting climate change is a vital challenge for mankind. Financial institutions can encourage companies to speed up the transition to a low carbon economy (Schoemaker & Van Tilburg, 2016). The economic costs of the environmental crisis are already significant from a macro and micro perspective, and could increase. The special report of IPCC (2018) on how to hold global warming to 1.5°C, concludes that global emissions will need to fall by 45% from 1990 levels by 2030 (Grantham Research Institute on Climate Change, LSE, & Initiative for Responsible Investment at the Harvard Kennedy School, 2018).

The transition to a low carbon economy entails risks and opportunities for the financial sector and the asset management industry. Therefore, it is urgent to accelerate low-carbon investments. Louche et al. (2019) define low carbon investments as a financial institution and investor practices that support and facilitate the transition from a fossil-fuel-based economy to a low carbon economy through low carbon and renewable technologies as well as energy efficiency measures. This transition includes policy and legal regulations limiting carbon emissions, new technologies, and changing consumer preferences.

On the one hand, there has to be a shift in investment patterns to limit anthropogenic climate change (Harnisch et al. 2014). Companies and investors should consider any possible action to safeguard the living conditions for future generations (Busch & Friede, 2018). On the other hand, since ecological and social imbalances could affect the economy and the markets in many ways, institutional investors should be ready to manage these risks. According to Krüger et al. (2018), climate risks may negatively affect the value of assets managed by institutional investors. These authors conducted survey among 439 institutional investors and found that the preferred approaches to managing climate risks are the analyses of carbon footprints and stranded asset risks. The least used tool is the divestment on companies in the portfolio.

Analyzing carbon footprints and climate risks in a portfolio can be arduous since the companies' disclosure of exposure is not universally mandatory or standardized. A branch of

academic literature is attempting to solve these limitations by proposing diverse methodologies to evaluate carbon risk and carbon footprints. Schoenmaker & Van Tilburg (2016), have developed a methodology that measures the carbon-related exposures across the value chain, including direct emissions and indirect ones through lending and investment (scope 1 to scope3). Ritchie & Dowlatabadi (2015) have coined the term carbon shadow that represents the GHG emissions embodied in an investor's portfolio returns. This metric could be used to estimate exposure to climate risks. Funds with large shadows would face a higher probability of financial loss in low emission scenarios. Institutional investors can use the carbon shadow to modify the asset mix in their portfolios. Gørgen et al. (2018) have focused on estimating carbon betas for companies and have found that it is possible for investors to reduce carbon risk in their portfolios without hurting performance.

Another way to managing climate risks should consider exposure to the so-called carbon bubble or the overvaluation of fossil fuel reserves, which leads to the problem of stranded assets. Private oils, gas, and coal mining companies are the owners of 25% of global fossil-fuel reserves (Schoenmaker & Van Tilburg, 2016), and if they cannot use them, this should have an impact on their valuations and the portfolios invested on them (Weyzig et al. 2014).

There are different SI strategies for aligning a fund with climate-related investment objectives and for introducing carbon risk in the decision making in portfolio selection. Many investors are already reducing exposure to high-carbon assets, excluding companies or sectors. Divestment may be one of the responses of investors, although, for some authors, it may increase transition risks because a sudden divestment-driven influx of large institutional investors into renewable energy companies could result in a 'green' bubble (Ritchie & Dowlatabadi, 2015). For this reason, many others opt for dialogue with the companies (Dimson et al., 2015), while other authors have shown that divestment does not harm portfolios. Trinks et al. (2018) compared the financial performance of investment portfolios with and without fossil fuel stocks in the US between 1927 and 2016, finding that the fossil fuel divestment does not seem to harm portfolio performance. In their study on institutional investors' approach to managing carbon risk, Bolton & Kacperczyk (2019) find that a categorical exclusionary screening approach only partially addresses the carbon risk issue, urging investors to include the demand side of the problem into the analysis.

Considering the diversity of approaches around carbon risk management, we ask ourselves which strategy or combination of strategies of SI results in the portfolios with the lowest carbon risk.

Given the complexity of carbon risk analysis, we hypothesize that investment strategies that do not rely solely on positive or negative filters can generate portfolios with lower carbon risk.

We thus hypothesize:

Hypothesis 2. Funds with advanced SI strategies exhibit lower carbon risk.

To the best of our knowledge, we have not found any study that evaluates the results of SI funds according to their strategy, ESG risk scores, and carbon intensity, i.e., considering all their possible utilities. In this context, we aim to identify which category of SI funds exhibit lower ESG and carbon risk.

3.3. Methodology

3.3.1. Data Description

To test the hypotheses proposed, this study analyzes equity funds registered for sale in Europe labeled by the Morningstar database as "socially conscious." According to Morningstar's definition, "socially conscious" indicates that the fund selectively invests based on certain non-economic principles (environmental responsibility, human rights, or religious views) and may take a pro-active stance by selectively investing in. This group also includes funds that avoid investing in companies involved in promoting alcohol, tobacco, or gambling, or the defense industry.

The analysis focuses on four main equity categories: Europe Large Cap Equity, Global Large Cap Equity, US Large Mid Cap Equity, and Global Emerging Markets Equity. According to Morningstar Direct data, these categories represent the areas of equity investment with more funds registered for sale in Europe. Since these funds invest in large-cap companies, more information is available to design sustainable portfolios properly. Smaller-sized companies tend to disclose a relatively lower volume of sustainability-related information than large caps (Demerens et al., 2014).

We gather portfolio information about ESG risks from Morningstar Direct. Morningstar uses sustainability data from Sustainalytics, which changed its methodology in 2018 to calculate ESG risks instead of ESG scores. Morningstar did not incorporate the new rating for mutual funds until November 2019, once they had one year of data gathered with the new Sustainalytics' ESG risks methodology. Therefore, all the funds included in our sample have at least one year of data available as of November 31, 2019. Our analysis covers the period November 2018-September 2020.

According to their new methodology, Sustainalytics' ESG Risk Rating approach used by Morningstar "has a clear focus on financial materiality: it measures the degree to which a company's enterprise value is exposed to material ESG issues. Although previous ratings recognized the importance of industry-specific topics, the ESG Risk Rating goes a step further by reflecting the relevance of each ESG issue in each company's unique context within its subindustry. The rating's absolute risk scores allow cross-sectorial ESG risk analysis".

Once the funds were collected, they were classified into five generations, from the most basic to the most advanced SI generation. Based on Renneboog et al. (2008), Eurosif (2018), and GSIA (2019) classifications, and aware of the industry practice of aggregation of strategies, which makes it increasingly challenging to be able to determine individual strategies (Eurosif, 2018), we propose a categorization of SI strategies.

To classify the funds in different generations, we use the information provided by Morningstar Direct database in their attributes framework. According to Morningstar, "the attributes framework offers investors a system that classifies the sustainable funds' landscape using funds' own stated objectives."

The funds that only apply negative belong to the first generation. The funds applying negative filters have communicated to Morningstar that overall they employ exclusions. The funds applying positive filters fall under the label ESG incorporation in the database and belong to the second generation. According to Morningstar's definition, these strategies often use positive screens to make their investment choices, tacitly removing companies that do not meet their standards in relevant environmental, social, and/or governance areas. ESG incorporation typically includes best-in-class strategies where managers select investments based on stronger ESG performance relative to peers.

Funds applying both negative and positive filters belong to the third SI generation. If their managers apply either negative or positive filters, or both, and declare to practice engagement, the funds belong to the third generation. In line with the findings of Dimson et al. (2015), we consider that an active ownership policy could result in better management of ESG risks. Hoepner et al. (2017) have found evidence of the effects of engagement with firms in risk reduction. Bertolotti (2020) underscores how the voluntary disclosure of ESG data and the lack of reporting standards make engagement and stewardship more critical.

Finally, the funds classified as impact funds form the fourth generation. These are funds that seek to make a measurable impact in investments on specific issue areas alongside a financial return. Although impact investment was more related to philanthropy and venture capital in its origins (Bugg-Levine & Emerson, 2011), the launch of SDGs in 2015 has led many listed companies to consider their role in financing these global goals. The so-called SDG investment case (PWC 2017) has prompted many asset managers to launch impact funds. Usually, impact funds in listed companies align their investments with one or more SDG and establish a set of metrics and key performance indicators (KPIs) to verify their impact. More and more practitioners consider impact investment as the new step in the evolution of SI. In sum, we agree with Bertolotti (2020) when he states that SI, to be effectively sustainable, must have the intention and be relevant in terms of a meaningful impact.

Table 1 shows the SI fund generations according to their underlying strategies.

Table 1. SI generations according to their strategies or aggregated strategies

1st Generation SI Strategies	2nd Generation SI Strategies	3rd Generation SI Strategies	4th Generation SI Strategies	5th Generation SI Strategies
Negative screening	Positive screening	Negative screening + Positive screening	Negative screening or/and Positive screening + Engagement	Impact Investment

Source: Own creation based on Renneboog et al. (2008), Eurosif (2018) and GSIA (2019).

Table 2 shows the number of all mutual funds in those five categories, according to our classification of generations of SI funds, based on the academic literature and the industry, from non-advanced (first generation) to more advanced (second, third, fourth generations) SI strategies and their combinations.

Table 2. Number of funds by category and SI generation

Global Category	SI Generation					Total	Percentage
	First	Second	Third	Fourth	Fifth		
Europe Equity Large Cap	26	59	70	44	36	235	39.97%
Global Emerging Markets	16	11	12	11	7	57	9.69%
Global Equity Large Cap	37	45	49	31	75	237	40.31%
US Equity Large Cap	15	6	16	14	8	59	10.03%
Total	94	121	147	100	126	588	
Percentage	15.99%	20.58%	25.00%	17.01%	21.43%		100%

3.3.2. Variable Description

To measure the ESG risks (see Table 3), we use the Morningstar Portfolio Historical Sustainability Risk Score, as well as the Environmental, Social, and Governance Portfolio Risk Scores.

Table 3. ESG attributes and Carbon Risk score by SI funds generations.

SI Generation	Historical Sustainability Risk Score		Environmental Risk Score		Social Risk Score		Governance Risk Score		Carbon Risk Score	
	Mean	STD	Mean	STD	Mean	STD	Mean	STD	Mean	STD
First	23.70	2.06	4.48	0.96	9.30	1.07	8.06	0.86	8.63	2.78
Second	21.82	1.83	4.12	0.76	8.74	1.16	7.68	0.71	6.74	2.03
Third	21.84	2.01	4.15	0.90	8.74	1.07	7.71	0.69	6.94	2.00
Fourth	21.91	1.75	3.90	0.77	8.84	1.14	7.64	0.72	6.45	1.83
Fifth	21.82	1.72	4.06	0.84	8.76	1.09	7.45	0.84	6.30	1.99

The Morningstar Portfolio Sustainability Score is an asset-weighted average of Sustainalytics' company-level ESG Risk Score. The Sustainalytics' company-level ESG Risk Score measures the degree to which a company's economic value may be at risk driven by ESG factors. Morningstar Historical Sustainability Score is a weighted average of the trailing 12 months of Morningstar Portfolio Sustainability Scores. Historical portfolio scores are not equal-weighted; rather, more recent portfolios are weighted more heavily than older portfolios. Like the ESG Risk Scores, the Portfolio Sustainability Score is rendered on a 0-100 scale, where lower scores are better, using an asset-weighted average of all covered securities. To receive a Portfolio Sustainability Score, at least 67% of a portfolio's assets under management (long positions only) must have a company ESG Risk Rating. The percentage of assets under management of the covered securities is rescaled to 100% before calculating the Portfolio Sustainability Score.

Environmental, Social, and Governance Portfolio Scores are the asset-weighted average of the Company Environmental/ Social/ Governance Risk scores for the covered holdings in a portfolio. Company Environmental/Social/Governance Risk Scores from Sustainalytics measure the degree to which a company's economic value may be at risk driven by environmental/social/governance factors. The environmental/social/governance risk represents the unmanaged environmental/social/governance risk exposure after considering a company's management of such risks. The Environmental/Social/ Governance Risk Scores are displayed as a number between 0 and 100, though most scores range between 0 and 25.

To measure the Carbon Risk (see Table 3), we use the Morningstar Portfolio Carbon Risk Score. It is the asset-weighted carbon-risk score of the equity or corporate-bond holdings in a portfolio (long positions only), averaged over the trailing 12 months. To calculate the portfolio carbon-risk scores, Morningstar uses Sustainalytics' company carbon-risk ratings, which indicate the risk that companies face from the transition to a low-carbon economy. Carbon risk rating is based on assessments across two dimensions: exposure and management. Exposure is a measure of the degree to which carbon risks are material across the company's supply chain, its own operations and in its products and services. Management is a measure of the ability and approach of the company to manage and reduce emissions and related carbon risks.

The sustainability risk scores provided by Morningstar seem to be aligned with the sustainability risk concept provided by the European Commission (EC, 2019).

3.3.3. Statistical model.

To analyze the differences among SI funds generations, we adopt a parametric ANOVA method where the dependent variables are the ESG risk scores and the carbon risk score; and the factor is the SI fund generation. The ANOVA test allows us to examine the mean differences between the four different groups of equity funds.

The ANOVA tests the null hypothesis that samples in all groups are drawn from populations with the same mean values. The ANOVA produces an F-statistic, the ratio of the variance calculated among means to the variance within the samples. Typically, the one-way ANOVA is used to test for differences among at least three groups, since a t-test can cover the two-group case.

The analysis of variance is based on three assumptions: normal distributed populations, homogeneity of variances, and independent samples (Moder & Moder, 2010). Vargha & Delaney (1998) recommend robust non-parametric tests in case of heterogeneous variances. Kruskal-Wallis test is recommended in situations where homoscedasticity is violated.

Given the assumptions in which the ANOVA test relies on, our analysis follows these steps: First, we conduct a Kolmogorov–Smirnov test of normality; second, we test the homogeneity of variances based on the Levene statistic¹. If there is homoscedasticity, we apply the parametric ANOVA one way to test which group is the most different. If the differences among SI fund

¹ Available upon request.

generations are statistically significant according to the F-statistic, we perform the Bonferroni and Tamhane post hoc tests to identify the differences between groups.

3.4. Results

This section first shows the results of the statistical tests and then discusses the main findings.

3.4.1. ESG risks: Analysis of mean differences between SI funds generations.

Table 4 displays that the results in terms of ESG risk scores differ according to SI funds generations; that is, there is a statistical difference between SI funds that only apply negative filters and funds that apply more advanced SI strategies on all the ESG risk scores measured: Historical Sustainability risk score, Environmental Risk score, Social risk score, and Governance risk score.

Table 4. ANOVA to test the differences in means between SI funds generations in terms of ESG risk scores.

		Sum of Squares	df	Mean Square	F	Sig.
Historical Sustainability Risk Score	Between Groups	272.180	4	68.045	19.260	0.000***
	Within Groups	2059.687	583	3.533		
	Total	2331.867	587			
Environmental Risk Score	Between Groups	17.453	4	4.363	6.091	0.000***
	Within Groups	417.606	583	0.716		
	Total	435.060	587			
Social Risk Score	Between Groups	23.415	4	5.854	4.801	0.001***
	Within Groups	710.891	583	1.219		
	Total	734.306	587			
Governance Risk Score	Between Groups	20.025	4	5.006	8.671	0.000***
	Within Groups	336.598	583	0.577		
	Total	356.623	587			

*** The mean difference is significant at the 0.01 level

We apply two post hoc tests to identify which groups are different between them. We use Bonferroni if equal variances are assumed and Tamhane if they are not, and we obtain similar results. Both tests show that there are statistically significant differences between the means of the Historical Sustainability Risk, Environmental Risk, Social Risk and Governance Risk scores of Generation 1 vs. Generations 2, 3, 4, and 5. They also show significant differences between the average Portfolio Governance Score between Generation 3 and Generation 5.

In table 5, we present the Bonferroni test results².

Table 5. POST HOC Tests. Multiple Comparisons

Dependent Variable				Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval		
							Lower Bound	Upper Bound	
Historical Sustainability Risk Score	Bonferroni	First	Second	1,87789*	0.258	0.000	1.150	2.606	
			Third	1,85940*	0.248	0.000	1.160	2.559	
			Fourth	1,79031*	0.270	0.000	1.029	2.551	
			Fifth	1,87767*	0.256	0.000	1.156	2.599	
			Second	First	-1,87789*	0.258	0.000	-2.606	-1.150
	Second	Third	Fourth	-0.01849	0.231	1.000	-0.669	0.632	
			Fifth	-0.08759	0.254	1.000	-0.803	0.628	
			Fourth	-0.00023	0.239	1.000	-0.674	0.674	
			Third	First	-1,85940*	0.248	0.000	-2.559	-1.160
			Second	0.01849	0.231	1.000	-0.632	0.669	
	Third	Fourth	Fifth	-0.06909	0.244	1.000	-0.756	0.617	
			Fifth	0.01827	0.228	1.000	-0.625	0.661	
			Fourth	First	-1,79031*	0.270	0.000	-2.551	-1.029
			Second	0.08759	0.254	1.000	-0.628	0.803	
			Third	0.06909	0.244	1.000	-0.617	0.756	
	Fourth	Fifth	Fifth	0.08736	0.252	1.000	-0.622	0.797	
			Fifth	First	-1,87767*	0.256	0.000	-2.599	-1.156
			Second	0.00023	0.239	1.000	-0.674	0.674	
			Third	-0.01827	0.228	1.000	-0.661	0.625	
			Fourth	-0.08736	0.252	1.000	-0.797	0.622	
Environmental Risk Score	Bonferroni	First	Second	0,35951*	0.116	0.021	0.032	0.687	
			Third	0,33312*	0.112	0.030	0.018	0.648	
			Fourth	0,58086*	0.122	0.000	0.238	0.923	
			Fifth	0,41714*	0.115	0.003	0.092	0.742	
			Second	First	-0,35951*	0.116	0.021	-0.687	-0.032
	Second	Third	Fourth	-0.02639	0.104	1.000	-0.319	0.266	
			Fifth	0.22136	0.114	0.534	-0.101	0.544	
			Fifth	0.05763	0.108	1.000	-0.246	0.361	
			Third	First	-0,33312*	0.112	0.030	-0.648	-0.018
			Second	0.02639	0.104	1.000	-0.266	0.319	
	Third	Fourth	Fourth	0.24774	0.110	0.243	-0.061	0.557	
			Fifth	0.08402	0.103	1.000	-0.206	0.374	
			Fourth	First	-0,58086*	0.122	0.000	-0.923	-0.238
			Second	-0.22136	0.114	0.534	-0.544	0.101	
			Third	-0.24774	0.110	0.243	-0.557	0.061	
	Fourth	Fifth	Fifth	-0.16372	0.113	1.000	-0.483	0.156	
			Fifth	First	-0,41714*	0.115	0.003	-0.742	-0.092
			Second	-0.05763	0.108	1.000	-0.361	0.246	
			Third	-0.08402	0.103	1.000	-0.374	0.206	
			Fourth	0.16372	0.113	1.000	-0.156	0.483	
Social Risk Score	Bonferroni	First	Second	0,55943*	0.152	0.003	0.132	0.987	
			Third	0,56058*	0.146	0.001	0.150	0.971	
			Fourth	0,46585*	0.159	0.034	0.019	0.913	
			Fifth	0,54384*	0.150	0.003	0.120	0.968	
			Second	First	-0,55943*	0.152	0.003	-0.987	-0.132

² Tahmane test results available upon request.

		Third		0.00115	0.136	1.000	-0.381	0.383
		Fourth		-0.09358	0.149	1.000	-0.514	0.327
		Fifth		-0.01559	0.141	1.000	-0.412	0.380
	Third	First		-0,56058*	0.146	0.001	-0.971	-0.150
		Second		-0.00115	0.136	1.000	-0.383	0.381
		Fourth		-0.09473	0.143	1.000	-0.498	0.309
		Fifth		-0.01674	0.134	1.000	-0.394	0.361
	Fourth	First		-0,46585*	0.159	0.034	-0.913	-0.019
		Second		0.09358	0.149	1.000	-0.327	0.514
		Third		0.09473	0.143	1.000	-0.309	0.498
		Fifth		0.07799	0.148	1.000	-0.339	0.495
	Fifth	First		-0,54384*	0.150	0.003	-0.968	-0.120
		Second		0.01559	0.141	1.000	-0.380	0.412
		Third		0.01674	0.134	1.000	-0.361	0.394
		Fourth		-0.07799	0.148	1.000	-0.495	0.339
Governance Risk Score	Bonferroni	First	Second	0,37856*	0.104	0.003	0.084	0.673
			Third	0,34194*	0.100	0.007	0.059	0.625
			Fourth	0,42165*	0.109	0.001	0.114	0.729
			Fifth	0,60206*	0.104	0.000	0.310	0.894
		Second	First	-0,37856*	0.104	0.003	-0.673	-0.084
		Third	-0.03662	0.093	1.000	-0.299	0.226	
		Fourth	0.04309	0.103	1.000	-0.246	0.332	
		Fifth	0.22350	0.097	0.212	-0.049	0.496	
	Third	First	-0,34194*	0.100	0.007	-0.625	-0.059	
		Second	0.03662	0.093	1.000	-0.226	0.299	
		Fourth	0.07971	0.098	1.000	-0.198	0.357	
		Fifth	0,26012*	0.092	0.050	0.000	0.520	
	Fourth	First	-0,42165*	0.109	0.001	-0.729	-0.114	
		Second	-0.04309	0.103	1.000	-0.332	0.246	
		Third	-0.07971	0.098	1.000	-0.357	0.198	
		Fifth	0.18041	0.102	0.768	-0.106	0.467	
	Fifth	First	-0,60206*	0.104	0.000	-0.894	-0.310	
		Second	-0.22350	0.097	0.212	-0.496	0.049	
		Third	-0,26012*	0.092	0.050	-0.520	0.000	
		Fourth	-0.18041	0.102	0.768	-0.467	0.106	

*. The mean difference is significant at the 0.05 level.

3.4.2. Carbon Risk: Analysis of mean differences between SI funds generations.

As Table 6 shows, there are statistically significant differences between SI funds generations on their carbon risk score. This result highlights that there is a statistical difference in the average carbon risk score between the first SI funds generation and funds that apply more advanced SI strategies. Therefore, we have to apply the post hoc tests to identify which generations are different between them

Table 6. ANOVA to test the differences in means between SI funds generations in terms of carbon risk scores.

		Sum of Squares	df	Mean Square	F	Sig.
Carbon Risk Score	Between Groups	347.876	4	86.969	19.296	0.000***
	Within Groups	2587.141	574	4.507		
	Total	2935.017	578			

*** The mean difference is significant at the 0.01 level

We apply two post hoc tests (Table 7) to identify which groups are different between them. We use Bonferroni if equal variances are assumed and Tamhane if they are not, and we obtain similar results. Both tests show that there are statistically significant differences between the means of Carbon Risk score of Generation 1 vs. Generation 2, Generation 3, Generation 4 and Generation 5. In table 7, we present the Bonferroni test results³.

Table 7. POST HOC Tests. Multiple Comparisons

Dependent Variable		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval		
					Lower Bound	Upper Bound	
Carbon Risk Score i	Bonferroni First	Second	1,89779*	0.294	0.000	1.071	2.725
		Third	1,68881*	0.281	0.000	0.897	2.481
		Fourth	2,18152*	0.306	0.000	1.320	3.043
		Fifth	2,33061*	0.291	0.000	1.511	3.150
	Second First	Third	-1,89779*	0.294	0.000	-2.725	-1.071
		Fourth	-0.20898	0.263	1.000	-0.951	0.533
		Fifth	0.28373	0.289	1.000	-0.532	1.099
		Fifth	0.43282	0.274	1.000	-0.338	1.204
	Third First	Second	-1,68881*	0.281	0.000	-2.481	-0.897
		Fourth	0.20898	0.263	1.000	-0.533	0.951
		Fifth	0.49271	0.277	0.756	-0.287	1.273
		Fifth	0.64180	0.260	0.140	-0.092	1.375
	Fourth First	Second	-2,18152*	0.306	0.000	-3.043	-1.320
		Third	-0.28373	0.289	1.000	-1.099	0.532
		Third	-0.49271	0.277	0.756	-1.273	0.287
		Fifth	0.14909	0.287	1.000	-0.659	0.957
	Fifth First	Second	-2,33061*	0.291	0.000	-3.150	-1.511
		Third	-0.43282	0.274	1.000	-1.204	0.338
		Third	-0.64180	0.260	0.140	-1.375	0.092
		Fourth	-0.14909	0.287	1.000	-0.957	0.659

*. The mean difference is significant at the 0.05 level.

3.5. Discussion

Table 8 summarizes the statistically significant differences between the SI funds generations. The results show that the most different SI fund generation is the first, which includes funds that only apply negative screening, which we consider as a non-advanced strategy. This first generation shows statistically significant different means in every variable analyzed compared with the rest of the four SI Funds generations.

³ Tahmane test results available upon request.

Generation 1 of SI Funds shows on average statistically significant (at $p < 0.01$) ESG risks in aggregate as measured by the Historical Sustainability Risk Score and in Governance Risk Score compared with Generations 2, 3, 4, and 5. Generation 1 also shows a statistically significant mean (at $p < 0.01$) in Environmental Risk Score than Generations 4 and 5 and at $p < 0.05$ with Generations 2 and 3. Finally, regarding the ESG attributes, Generation 1 shows statistically significant (at $p < 0.01$) Social Risk Score compared with Generations 2, 3, and 5 and at $p < 0.05$ with Generation 4.

Regarding the variable Carbon Risk Score, again, Generation 1 of SI Funds shows a statistically significant mean (at $p < 0.01$) compared to Generations 2, 3, 4, and 5

Table 8. Summary of statistically significant differences of means between SI funds generations

	Generation 1	Generation 2	Generation 3	Generation 4	Generation 5
Generation 1 Negative screening		Sustainability Risk Score Env. Risk Score Soc. Risk Score Gov. Risk Score Carbon Risk Score	Sustainability Risk Score Env. Risk Score Soc. Risk Score Gov. Risk Score Carbon Risk Score	Sustainability Risk Score Env. Risk Score Soc. Score Gov. Risk Score Carbon Risk Score	Sustainability Risk Score Env. Risk Score Soc. Risk Score Gov. Risk Score Carbon Risk Score
Generation 2 Positive Screening	Sustainability Risk Score Env. Risk Score Soc. Risk Score Gov. Risk Score Carbon Risk Score				
Generation 3 Negative + Positive Screening	Sustainability Risk Score Env. Risk Score Soc. Risk Score Gov. Risk Score Carbon Risk Score				
Generation 4 Neg. or and Pos. Screening + Engagement	Sustainability Risk Score Env. Risk Score Soc. Risk Score Gov. Risk Score Carbon Risk Score				
Generation 5 Impact Investment	Sustainability Risk Score Env. Risk Score Soc. Risk Score Gov. Risk Score Carbon Risk Score		Gov. Risk Score		

These results show that, on average, first SI funds generation, the ones that only apply negative filters, achieve higher ESG risk scores whether in aggregated, as measured in terms of Historical Sustainability Score, as in each of the ESG risk domains: Environmental, Social and Governance, compared to the four more advanced Generations of SI funds. The first generation of SI funds also shows a higher Carbon Risk score.

It is worth mentioning that, as shown in Table 3, Generation 5 that encompasses impact funds, achieves the lowest Governance Risk and Carbon Risk scores, and Generation 4 that includes funds with policies of stewardship obtains the lowest Environmental risk score. Regarding the Social Risk, we find the lowest scores in Generation 2 (positive screening) and Generation 3 (a combination of positive and negative screening). However, there are no statistically significant differences between the means of SI Funds Generations with advanced SI strategies, except between the third and five Generations in Governance Risk Score where impact funds show lower risk.

Therefore, Hypothesis H1 is accepted; funds with advanced SI strategies exhibit lower ESG risks, since the means of the four ESG risk scores analyzed (Historical Sustainability Risk Score, Environmental Risk Score, Social Risk Score, and Governance Risk Score) show lower ESG risks in all the four advanced SI Generations vs. SI Generation 1. The results are in line with the branch of recent literature that considers simple negative screening as an outdated or non-advanced practice versus forward-looking ESG analysis focused on assessing the materiality of nontraditional data to determine which companies are best fit to face sustainability risks (Townsend, 2020); and maintain that ESG investing is fundamentally different from screening out sin stocks (Alessandrini & Jondeau, 2020).

Finally, from the evidence presented, H2 is accepted. Funds with advanced SI strategies exhibit lower carbon risk since the mean of the Carbon Risk Score of Generation 1 is statistically significantly higher than the means of Generations 2, 3, 4, and 5. This outcome underscores the effort that, according to Schoenmaker & Van Tilburg (2016), some financial institutions have started to do by setting targets to reduce carbon emissions in their lending and investments. The result could also reflect the growing awareness of more advanced SI fund managers about the consequences of exposure to the so-called carbon bubble (Schoenmaker & Van Tilburg, 2016; Weyzig et al. 2014, Cheema-Fox et al., 2020), considering that more advanced SI strategies allow better management of portfolio carbon risks

Although negative screening is still the strategy with more assets under management, these findings align with the industry gradual change to more advanced SI strategies (Eurosif, 2018).

This change should be expected in a market with more available risk data (heterogeneous but available), where ESG and Carbon risks are starting to be considered risk factors in the construction of investment portfolios (Maiti, 2020).

3.6. Conclusion

Sustainable investment is on its way to becoming a paradigm shift in the financial world. Originally, SI was about how to avoid harm, excluding specific sectors and companies. It gradually shifted to try to benefit different stakeholders in a sector. Nevertheless, after the launch of the SDGs (2015) and the Paris agreement (2015), it should be something more; SI can be part of the solution, a bridge between the financial sector and sustainable development.

The challenges of climate change and the risks and opportunities of the transition to a decarbonized economy are already part of the European legislation. The release of the European Commission's Action Plan on Financing Sustainable Growth in 2018 has entirely changed the landscape of SI in the continent. The Taxonomy, the regulation on climate benchmarks (CTB and PAB), and the Sustainable Finance Disclosure Regulation (SFDR) directly affect the asset management industry.

In this new regulatory environment, EU managers and managers of funds distributed in the EU will be required to incorporate ESG and non-financial risks into their risk management frameworks, and all products will be assessed for potential ESG risks, even if they are not explicitly ESG products. Sustainability risks are now the focus, and they have to be measurable and comparable.

Despite these radical changes and milestones in the SI world, there are very few academic studies on SI funds that evaluate how they manage ESG risks according to the different SI strategies they apply. For this reason, in contrast to previous literature, our aim with this study is to measure the ESG risk exposure of ESG portfolios managed with different SI strategies within a complete framework consistent with global challenges that consider sustainability and carbon risks. But, which SI strategy achieves the lowest sustainability and carbon risks and therefore facilitates the integration of sustainability into the financial market, contributing to sustainable development?

The results show that, on average, the funds managed according to advanced SI strategies achieve statistically significant lower ESG risks in terms of all the four ESG risks variables analyzed: the Historical Sustainability Risk Score, the Environmental Risk Score, the Social Risk

Score, and the Governance Risk Score compared to the funds that only applies negative filters (first SI funds generation). This first generation of SI funds also shows a statistically significant Carbon Risk score than the four advanced strategies.

The above findings confirm that the transition to a lower-carbon economy and the 2030 sustainability agenda demands more advanced investment strategies that consider which ESG criteria and extra-financial risks could be more significant. The oldest and most basic SI practice was a starting point when there was a lack of data, but as we have shown, it is not the best-fitted strategy to reduce ESG and carbon risks of the investment portfolios. Negative screening is still the most used SI strategy, but if the fund management industry wants to make a more profound and broader contribution to sustainability and climate change mitigation, managers stuck with this SI strategy should consider more advanced SI strategies. Strategies that not only avoid specific sectors but focus on activities and industries that can have a positive and measurable effect and impact on sustainability, contributing either to the mitigation of climate change or to achieving specific SDGs, or both.

In terms of competitive advantage, if investment funds' performance is analyzed and compared from a complete framework that includes ESG attributes and climate change scores, many asset management companies would be compelled to evolving in their SI practices. This advance could be relevant in terms of risk control and fiduciary duty. Moreover, by following these advanced strategies, those investment funds will better comply with the regulations soon to be imposed in the Eurozone regarding Taxonomy and Disclosure.

The COVID-19 pandemic has raised awareness of ESG issues and has prompted action towards a different economic recovery model after the downturn, a sustainable one. In Europe, the Just Transition fund (up to 40 EUR billion) and the European Recovery and Resilience Facility with EUR 310 billion of grants and 250 billion of loans have sustainability and low carbon transition at its core (PWC, 2020). The asset management industry should be ready to be part of this opportunity. To make a significant contribution to a sustainable recovery, asset managers need advanced investment strategies. Strategies or a combination of them, that could effectively tackle SDGs' achievement, as we see in some new recently launched Impact Funds (SI Generation5), or the will to influence their investee companies through engagement (SI Generation 4), or the access to analysis and data to design lower ESG risks portfolios (SI Generations 2, 3, 4, and 5).

In sum, this study contributes to the previous literature in achieving a more profound knowledge about the different SI strategies' different outcomes, not based on financial performance but widening the focus to ESG and Carbon risks. It may also be useful for the asset management companies if it helps increase the awareness of the crucial importance of moving forward in SI practice in terms of fiduciary duty, legal compliance, competitive advantage, and contribution to sustainable development.

The method employed in this study could have limitations. We are aware that given the documented divergence of ESG ratings (Gibson et al., 2020) choosing only one database for this study may have shortcomings. We rely on Morningstar data based on Sustainalytics methodology, and data from different suppliers could show other outcomes. Moreover, Sustainalytics relies on self-disclosed data by companies, which could have potential drawbacks. Second, given the recent launch of Morningstar funds' sustainability risk scores, our analysis period is forcibly short. Third, our study is based on large-cap funds invested in different regional areas but focuses on vehicles registered and or distributed in Europe, which could make our results less generalizable. Thus, future research in advanced SI practices could focus on different data suppliers, players, and assets, encompassing more extended periods.

4. Conclusion, Contributions and Future Research

Sustainable investment has undergone an enormous change in the last decades. Investors, researchers, and regulators seem increasingly committed to an investment practice that constitutes a vital tool for sustainable development, framed by the 2030 Agenda and the Paris Agreements.

This thesis contributes to understanding how one of the leading market actors, such as the asset management industry, can contribute more effectively to sustainable development, given the urgency and scope of the challenges involved.

Throughout this study, we learn how the SDGs are being integrated into investment portfolios and the challenges that this integration entails. We have also analyzed the most appropriate SI strategies that contribute more effectively to sustainability and why investors may adopt these strategies.

This thesis contributes to the academic and professional ambits by analyzing the contribution of SI to sustainable development in the framework of the SDGs and global risks. Specifically, through the analysis of the asset management industry behavior, as a leading market player, and how they integrate advanced SI practices to address financial and ESG risks. The aim is to lay the foundations for a more impactful SI in the mainstream of the financial market.

In this concluding chapter, the main contributions extracted from each of the chapters, as well as the main limitations of this thesis and future lines of research, are explained in the following sections.

4.1. Contributions

This thesis contributes to the existing literature in many different ways. From a practical perspective, the findings are relevant to academics, regulators, and the asset management industry.

First, this thesis contributes to a better understanding of how the financial markets integrate the 2030 Agenda, who the leading players are, and which SI strategies they are using.

The results of the systematic literature review carried out in Chapter One show that the asset management industry is key for integrating SDGs in the financial markets, whether through their influence in the investee companies or their investment products. The research findings

also indicate that SDGs are being integrated into investment portfolios, particularly those managed according to impact investment strategy and those that practice active ownership. However, the integration is not uniform and is characterized by SDG cherry-picking. Asset managers face many challenges to align effectively in the 2030 Agenda. The heterogeneity of data and methodologies of measurement and disclosure that could hinder the correct assessment of SDGs and how to implement investment strategies with bigger impact seems the more salient. However, there are others, as the risks that climate change and other ESG issues could pose to portfolios, the perils of greenwashing and rainbow washing, or the temptation of rebranding without additionality in a market becoming exceedingly competitive.

These findings advance the extant literature on sustainable investment, overcoming the performance debate and focusing on how SI could make a more effective contribution to sustainable development and the challenges involved. Moreover, the findings also have important implications for the financial market, helping to highlight the key points for the future definition of actions to making progress in the goals and targets of the 2030 Agenda.

Second, this thesis identifies the main drivers for adopting advanced sustainable and responsible investment practices by asset management companies to know why and which companies better advance the strengthening of SI in the European financial market considering an original combination of different SI drivers.

The results provided in Chapter Two show that having a formal CSR policy and the societal pressures are the main drivers for adopting advanced SI practices.

Societal pressures were the original force beyond the creation of the first SRI funds, and their relevance does not seem to be fading. These pressures, translated currently in legislative changes (European Commission Action Plan (2018), international initiatives like the UNPRI, and the direct client mandates, are driving SI practices towards a deeper level of ESG criteria integration in Europe. However, this research goes further and shows that social pressures are really a driving factor in three critical areas within the asset management industry: (1) for the integration of advanced SI strategies, (2) for the integration and measurement of ESG risks, and (3) for the definition of engagement policies.

The influence of societal pressures (regulatory changes and international initiatives) is now reflected in the Sustainable Finance Disclosure Regulation (SFDR, 2021), the new European regulation on disclosure and classification of financial products. SFDR distinguishes between Article 6 products that take into account financially material sustainability / ESG risks but do

not necessarily affect the portfolio construction; Article 8 products that promote sustainable, environmental, or social characteristics, and Article 9 ones, that have the explicit objective of having a positive and measurable impact on environmental or social issues.

We have also seen confirmed the relationship between CSR and SI. Previous studies show that CSR is a driver of SRI (Balaguer et al. 2008). However, this research delves into this aspect and shows that it is specifically a driver for the integration and measurement of ESG risks and the definition of engagement policies. Therefore, given this fact, asset managers should make efforts to define a formal CSR policy that allows the integration of advanced SRI practices into the European asset management industry.

Third, this thesis contributes to fill the gap in the extant literature on the evaluation of how different SI strategies produce different sustainability outcomes.

The third Chapter shows that, on average, the funds managed according to advanced SI strategies achieve statistically significant lower ESG risks in terms of all the four ESG risks variables analyzed: the Historical Sustainability Risk Score, the Environmental Risk Score, the Social Risk Score, and the Governance Risk Score compared to the funds that only applies negative filters (first SI funds generation). This first generation of SI funds also shows a statistically significant Carbon Risk score than the four advanced strategies.

The above findings confirm that the transition to a lower-carbon economy and the 2030 sustainability agenda demands more advanced investment strategies that consider which ESG criteria and extra-financial risks could be more significant. The oldest and most basic SI practice was a starting point when there was a lack of data, but as we have shown, it is not the best-fitted strategy to reduce ESG and carbon risks of the investment portfolios. Negative screening is still the most used SI strategy, but if the fund management industry wants to make a more profound and broader contribution to sustainability and climate change mitigation, managers stuck with this SI strategy should consider more advanced SI strategies. Strategies that not only avoid specific sectors but focus on activities and industries that can have a positive and measurable effect and impact on sustainability, contributing either to the mitigation of climate change or to achieving specific SDGs, or both.

In sum, this thesis contributes to the previous literature in achieving a more profound knowledge about the different SI strategies' different outcomes, not based on financial performance but widening the focus to ESG and Carbon risks. It may also be useful for the asset management companies if it helps increase the awareness of the crucial importance of moving

forward in SI practice in terms of fiduciary duty, legal compliance, competitive advantage, and contribution to sustainable development.

4.2. Limitations and future research

SI has advanced significantly in the last few years with the aim of supporting the emergence of a more sustainable economic system. For this reason, this thesis studies how sustainable investment can have a major and more effective impact on sustainable development. Nonetheless, this study is not without some limitations that will allow us to lay the foundations for future studies.

The systematic literature review, carried out in Chapter One, has certain limitations derived from search engineering. In addition, research goals have conditioned the exclusion of articles that merely name SDGs to focus on those that analyze their effective integration. Moreover, the fact that the SDGs were launched in 2015 determines that not enough time has elapsed to analyze the total contribution of the SI to achieving the SDGs. In this context, given the evolution of the SI investment strategies we are witnessing, future analysis could focus on how these strategies continue to evolve, measuring how they are gaining market share and evaluating the evolution of their contribution to sustainability. Since many sustainability KPI data do not have a significant track record, the measurement of evolution will be more accurate and revealing in a few years' time.

The method employed in Chapter Two could have some limitations. Although representative of an important proportion of the assets under management in Europe, the sample is composed of only 45 respondents of the survey, which can make our results less generalizable. Second, even if it includes companies from other continents, it is focused on Europe. Thus, future research in advanced SI practices should focus on different markets and players. Moreover, it could be interesting to carry out this study in the current context to analyze the incidence of COVID-19 as a driving factor of SI and new models for measuring extra-financial risks.

Another limitation concerns the method employed in Chapter Three. We are aware that given the documented divergence of ESG ratings choosing only one database for this study may have shortcomings. We rely on Morningstar data based on Sustainalytics methodology, and data from different suppliers could show other outcomes. Moreover, Sustainalytics relies on self-disclosed data by companies, which could have potential drawbacks. Second, given the recent launch of Morningstar funds' sustainability risk scores, our analysis period is forcibly short. Third, our study is based on large-cap funds invested in different regional areas but focuses on

vehicles registered and or distributed in Europe, which could make our results less generalizable. Thus, future research in advanced SI practices could focus on different data suppliers, players, and assets, encompassing more extended periods.

In conclusion, this thesis offers new and interesting insights on sustainable investing strategies within the framework of the Sustainable Development Goals, and opens a broad range of research questions that should be addressed by academics and practitioners to strengthen the sustainable investing process into the asset management industry to contribute to sustainable development efficiently in the current context of global risks.

References

- Alessandrini, F., & Jondeau, E. (2020). Optimal Strategies for ESG Portfolios. Swiss Finance Institute Research Paper, (No. 20-21). <https://doi.org/10.2139/ssrn.3578830>
- Arjaliès, D. L. (2010). A social movement perspective on finance: How socially responsible investment mattered. *Journal of Business Ethics*, 92(SUPPL 1): 57–78. <https://doi.org/10.1007/s10551-010-0634-7>
- Alshehhi, A., Nobanee, H., & Khare, N. (2018). The impact of sustainability practices on corporate financial performance: Literature trends and future research potential. *Sustainability (Switzerland)*, 10(2). <https://doi.org/10.3390/su10020494>
- Amel Zadeh, A., & Serafeim, G. (2018). Why and how investors use ESG information: Evidence from a global survey. *Financial Analysts Journal*, 74(3), 87–103. <https://doi.org/10.2469/faj.v74.n3.2>
- Arjaliès, D. L. (2010). A social movement perspective on finance: How socially responsible investment mattered. *Journal of Business Ethics*, 92(SUPPL 1): 57–78. <https://doi.org/10.1007/s10551-010-0634-7>
- Ashwin Kumar, N. C., Smith, C., Badis, L., Wang, N., Ambrosy, P., & Tavares, R. (2016). ESG factors and risk-adjusted performance: a new quantitative model. *Journal of Sustainable Finance and Investment*, 6(4), 292–300. <http://doi.org/10.1080/20430795.2016.1234909>
- Auer, B. R., & Schuhmacher, F. (2016). Do socially (ir)responsible investments pay? New evidence from international ESG data. *Quarterly Review of Economics and Finance*, 59: 51–62. <https://doi.org/10.1016/j.qref.2015.07.002>
- Balaguer Franch, M. R., Fernandez Izquierdo, M. A., & Muñoz Torres, M. J. (2008). The role of fund management institutions in the development of socially responsible investments: an analysis of the Spanish case. *International Journal Electronic Finance*, 2(3): 314–329. <https://doi.org/10.1504/IJEF.2008.020603>
- Banerjee, S. B. (2010). Governing the global corporation: A critical perspective. *Business Ethics Quarterly*, 20: 265–274. <https://www.jstor.org/stable/25702397>
- Barber, B. M., Morse, A., & Yasuda, A. (2020). Impact investing. *Journal of Financial Economics*, 139(1), 162–185. <https://doi.org/10.1016/j.jfineco.2020.07.008>
- Barnett, M. L., & Salomon, R. M. (2006). Beyond dichotomy: The curvilinear relationship between social responsibility and financial performance. *Strategic Management Journal*, 27, 1101–1122. <http://doi.org/10.1002/smj.557>
- Bauer, R., Koedijk, K., & Otten, R. (2002). International evidence on Ethical Fund Performance and Investment Style. Centre for Economic Policy Research, (July), 1–28.
- Bengtsson, E.. (2008). A History of Scandinavian Socially Responsible Investing, *Journal of Business Ethics* 82(4): 969–983. <https://doi.org/10.1007/s10551-007-9606-y>
- Berg, F., Koelbel, J. F., & Rigobon, R. (2019). Aggregate Confusion: The Divergence of ESG Ratings. MIT Sloan School of Management. <https://doi.org/10.2139/ssrn.3438533>

- Berry, T. C., & Junkus, J. C. (2013). Socially Responsible Investing: An Investor Perspective. *Journal of Business Ethics*, 112(4): 707-720. <https://doi.org/10.1007/s10551-012-1567-0>
- Berry, R. H., & Yeung, F. (2013). Are Investors Willing to Sacrifice Cash for Morality? *Journal of Business Ethics*, 117: 477-492. <https://doi.org/10.1007/s10551-012-1529-6>
- Bertolotti, A. (2020). Effectively managing risks in an esg portfolio. *Journal of Risk Management in Financial Institutions*, 13(3), 202-211.
- Betti, G., Consolandi, C., & Eccles, R. G. (2018). The relationship between investor materiality and the sustainable development goals: A methodological framework. *Sustainability (Switzerland)*, 10(7). <https://doi.org/10.3390/su10072248>
- Bilbao-Terol, A., Arenas-Parra, M., Alvarez-Otero, S., and Cañal-Fernández, V. (2019). Integrating corporate social responsibility and financial performance. *Management Decision*, 57(2): 324-348. <https://doi.org/10.1108/MD-03-2018-0290>
- Boiral, O., Talbot, D., & Brotherton, M. C. (2020). Measuring sustainability risks: A rational myth? *Business Strategy and the Environment*, (July 2019), 1-15. <https://doi.org/10.1002/bse.2520>
- Bolton, P., & Kacperczyk, M. T. (2019). Do Investors Care about Carbon Risk? National Bureau of Economic Research. <https://doi.org/10.2139/ssrn.3398441>
- Bollen, N. 2007. 'Mutual fund attributes and investor behavior'. *Journal of Financial and Quantitative Analysis*, 683-708.
- Bradford, M., Earp, J. B., & Williams, P. F. (2017). Understanding sustainability for socially responsible investing and reporting. *Journal of Capital Markets Studies*, 1(1), 10-35. <http://doi.org/10.1108/jcms-10-2017-005>
- Breitenstein, M., Nguyen, D. K., & Walther, T. (2020). Environmental Hazards and Risk Management in the Financial Sector: A Systematic Literature Review. *Journal of Economic Surveys*, 35 (2): 512-538 <https://doi.org/10.1111/joes.12411>
- Bugg-Levine, A., & Emerson, J. (2011). Impact investing: Transforming how we make money while making a difference. *Innovations: Technology, Governance, Globalization*, 6(3), 9-18.
- Bui, T. D., Ali, M. H., Tsai, F. M., Iranmanesh, M., Tseng, M. L., & Lim, M. K. (2020). Challenges and trends in sustainable corporate finance: A bibliometric systematic review. *Journal of Risk and Financial Management*, 13(11), 264.
- Busch, T., Bauer, R., & Orlitzky, M. (2015). Sustainable Development and Financial Markets: Old Paths and New Avenues. *Business and Society*, 55(3): 303-329. <https://doi.org/10.1177/0007650315570701>
- Busch, T., & Friede, G. (2018). The robustness of the corporate social and financial performance relation: A second-order meta-analysis. *Corporate Social Responsibility and Environmental Management*, 25(4), 583-608. <http://doi.org/10.1002/csr.1480>
- Camilleri, M. A. (2020). The market for socially responsible investing: a review of the developments. *Social Responsibility Journal*, 17(3), 412-428. <https://doi.org/10.1108/SRJ-06-2019-0194>

- Capelle-Blancard, G., & Monjon, S. (2012). A European Review Trends in the literature on socially responsible investment: looking for the keys under the lamppost" *Business Ethics: A European Review*, 21(3): 239–250. <https://doi.org/10.1111/j.1467-8608.2012.01658.x>
- Capelle-Blancard, G., & Monjon, S. (2014). The Performance of Socially Responsible Funds : Does the Screening Process Matter ? *European Financial Management*, 20(3): 494–520. <https://doi.org/10.1111/j.1468-036X.2012.00643.x>
- Carè, R., & Wendt, K. (2018). *Social Impact Investing Beyond the SIB*. Palgrave Macmillan, Cham <https://doi.org/10.1007/978-3-319-78322-2>
- Cheema-Fox, A., Laperla, B. R., Serafeim, G., Turkington, D., & Wang, H. S. (2020). Decarbonizing Everything: Climate Data , Industry Returns , and Portfolio Construction, 1–49. Working Paper. Harvard Business School.
- Clark, G. L., Feiner, A., & Viehs, M. (2015). for Arabesque Partners and the Smith College of Oxford University. "From the stockholder to the stakeholder. How sustainability can drive financial outperformance", (March) Working paper. <http://dx.doi.org/10.2139/ssrn.2508281>
- Clark, G. L., & Hebb, T. (2005). Why should they care? The role of institutional investors in the market for corporate global responsibility. *Environment and Planning A*, 37(11): 2015–2031. <https://doi.org/10.1068/a38116>
- Consolandi, C., Phadke, H., Hawley, J., & Eccles, R. G. (2020). Material ESG Outcomes and SDG Externalities: Evaluating the Health Care Sector's Contribution to the SDGs. *Organization and Environment*, 33(4), 511–533. <https://doi.org/10.1177/1086026619899795>
- Cooper, L.A., & Weber, J. (2020). Does Benefit Corporation Status Matter to Investors? An Exploratory Study of Investor Perceptions and Decisions. *Business and Society*, 2020 <https://doi.org/10.1177/0007650319898462>
- Cunha, F. A. F. de S., de Oliveira, E. M., Orsato, R. J., Klotzle, M. C., Cyrino Oliveira, F. L., & Caiado, R. G. G. (2020). Can sustainable investments outperform traditional benchmarks? Evidence from global stock markets. *Business Strategy and the Environment*, 29(2), 682–697. <https://doi.org/10.1002/bse.2397>
- Cusumano, M. A., Kahl, S. j., & Suarez, F. F. (2008). Services, industry evolution, and the copetitive strategies of product firms. *Academy of Management Journal*, 51(2): 315–334. <https://doi.org/10.1002/smj.2235>
- Dam, L., & Scholtens, B. (2015). Toward a theory of responsible investing : On the economic foundations of corporate social responsibility. *Resource and Energy Economics*, 41: 103–121. <https://doi.org/10.1016/j.reseneeco.2015.04.008>
- Daugaard, D. (2019). Emerging new themes in environmental, social and governance investing: a systematic literature review. *Accounting and Finance*, 60(2), 1501–1530. <https://doi.org/10.1111/acfi.12479>
- Dawkins, C.E. (2018). Elevating the Role of Divestment in Socially Responsible Investing. *Journal of Business Ethics*, 153 (2): 465-478. <https://doi.org/10.1007/s10551-016-3356-7>
- Dec, P., & Masiukiewicz, P. (2021). Socially responsible financial products as a contribution of financial institutions to sustainable development. *Sustainability (Switzerland)*, 13(6). <https://doi.org/10.3390/su13063067>

- Demerens, F., Géraud, B., Paré, J.-L., & Rédis, J. (2014). Do European Mid-cap firms disclose enough non-financial, specifically CSR-related information to their stakeholders? *Gestion 2000* (Vol. 31). <https://doi.org/10.3917/g2000.311.0179>
- Diener, J., & Habisch, A. (2020). A plea for a stronger role of non-financial impact in the socially responsible investment discourse. *Corporate Governance (Bingley)*, 21(2), 294–306. <https://doi.org/10.1108/CG-01-2020-0039>
- Diez-Cañamero, B., Bishara, T., Otegi-Olaso, J. R., Minguez, R., & Fernández, J. M. (2020). Measurement of corporate social responsibility: A review of corporate sustainability indexes, rankings and ratings. *Sustainability (Switzerland)*, 12(5). <https://doi.org/10.3390/su12052153>
- Dilla, W., Janvrin, D., Perkins, J. & Raschke, R. (2016). Investor views, investment screen use, and socially responsible investment behavior. *Sustainability Accounting, Management and Policy Journal*, 7(2): 246-267. <https://doi.org/10.1108/SAMPJ-07-2015-0066>
- Dimson, E., Karakaş, O., & Li, X. (2015). Active Ownership. *Review of Financial Studies*, 28(12), 3225–3268. <https://doi.org/10.1093/rfs/hhv044>
- Drei, A., Le Guenedal, T., Lepetit, F., Mortier, V., Roncalli, T., & Sekine, T. (2020). ESG Investing in Recent Years: New Insights from Old Challenges. *Amundi Discussion Paper*, 42(February 2020). <https://doi.org/10.2139/ssrn.3683469>
- Eccles, R.G. (2015). *Corporate and Integrated Reporting: A Functional Perspective*. Chapter in *Stewardship of the Future*, Edited by Ed Lawler, Sue Mohrman, and James O'Toole, Greenleaf, 2015.
- Eccles, R. G., & Serafeim, G. (2011). Market Interest in Nonfinancial Information. *Journal of Applied Corporate Finance*, 23(4): 113–127. <https://doi.org/10.1111/j.1745-6622.2011.00357.x>
- Eccles, R. G., & Serafeim, G. (2013). The Performance Frontier. *Harvard Business Review*, 91(5): 50-60.
- Epstein MJ, & Widener SK. (2011). Facilitating Sustainable Development Decisions: Measuring Stakeholder Reactions. *Business Strategy and the Environment*, 20(2): 107–123. <https://doi.org/10.1002/bse.680>
- Escrig-Olmedo, E., Muñoz-Torres, M. J., & Fernandez-Izquierdo, M. A. (2013). Sustainable Development and the Financial System: Society's Perceptions About Socially Responsible Investing. *Business Strategy and the Environment*, 22: 410–428. <https://doi.org/10.1002/bse.1755>
- Escrig-Olmedo, E., Rivera-Lirio, J. M., Muñoz-Torres, M. J., & Fernández-Izquierdo M. Á. (2017). Integrating multiple ESG investors' preferences into sustainable investment: A fuzzy multicriteria methodological approach. *Journal of cleaner production*, 162, 1334-1345.
- Escrig-Olmedo, E., Fernández-Izquierdo, M. ángeles, Ferrero-Ferrero, I., Rivera-Lirio, J. M., & Muñoz-Torres, M. J. (2019). Rating the raters: Evaluating how ESG rating agencies integrate sustainability principles. *Sustainability*, 11(3). <https://doi.org/10.3390/su11030915>
- European Commission (2018): *Action Plan: Financing Sustainable Growth*. Available at: https://ec.europa.eu/info/publications/180308-action-plan-sustainable-growth_en (Accessed on April 2021).

- European Commission (2019)
<https://eurlex.europa.eu/legalcontent/EN/TXT/PDF/?uri=CELEX:32019R2088&from=EN>
- Eurosif. (2016). European SRI Study. Available at: <http://www.eurosif.org/sri-study-2016/> (Accessed on April 2021).
- Eurosif. (2018). European SRI study 2018. Eurosif, European SRI study. Retrieved from <http://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:European+SRI+Study#8>
- Eweje, G., Sajjad, A., Nath, S. D., & Kobayashi, K. (2021). Multi-stakeholder partnerships: a catalyst to achieve sustainable development goals. *Marketing Intelligence and Planning*, 39(2), 186–212. <https://doi.org/10.1108/MIP-04-2020-0135>
- Folqué, M., Escrig-Olmedo, E., & Corzo Santamaría, T. (2021). Sustainable development and financial system: Integrating ESG risks through sustainable investment strategies in a climate change context. *Sustainable Development*, (January), 1–15. <https://doi.org/10.1002/sd.2181>
- Forestier, O., & Kim, R. E. (2020). Cherry-picking the Sustainable Development Goals: Goal prioritization by national governments and implications for global governance. *Sustainable Development*, 28(5), 1269–1278.
- Friede, G. (2019). Why don't we see more action? A metasynthesis of the investor impediments to integrate environmental, social, and governance factors. *Business Strategy and the Environment*, 28(6), 1260–1282. <https://doi.org/10.1002/bse.2346>
- Freeman, R.E. (1984). *Strategic Management: A Stakeholder Approach*, Pitman, Boston, MA.
- Freshfields Bruckhaus Deringer. (2005). "A Legal Framework for the Integration of Environmental, Social and Governance Issues into Institutional Investment". Geneva: United Nations Environment Programme Finance Initiative.
- Friede, G., Busch, T., & Bassen, A. (2015). ESG and financial performance: aggregated evidence from more than 2000 empirical studies. *Journal of Sustainable Finance and Investment*, 5(4): 210–223. <https://doi.org/10.1080/20430795.2015.1118917>
- Fulton, M., Kahn, B. M., & Sharples, C. (2012). "Sustainable Investing: Establishing long-term value and performance". Deutsche Bank Group DB Climate Change Advisors, (June), pp. 1–72. Working paper. <http://dx.doi.org/10.2139/ssrn.2222740>
- Gallego-Sosa, C., Gutiérrez-Fernández, M., Fernández-Torres, Y., & Nevado-Gil, M. T. (2021). Corporate social responsibility in the European banking sector: Commitment to the 2030 agenda and its relationship with gender diversity. *Sustainability (Switzerland)*, 13(4), 1–23. <https://doi.org/10.3390/su13041731>
- Gangi, F., & Varrone, N. (2018). Screening activities by socially responsible funds: A matter of agency? *Journal of Cleaner Production*, 197, 842–855. <http://doi.org/10.1016/j.jclepro.2018.06.228>
- García-Sánchez, I. M., Rodríguez-Ariza, L., Aibar-Guzmán, B., & Aibar-Guzmán, C. (2020). Do institutional investors drive corporate transparency regarding business contribution to the sustainable development goals? *Business Strategy and the Environment*, 29(5), 2019–2036. <https://doi.org/10.1002/bse.2485>

- Gibson, R., Krueger, P., Riand, N., & Schmidt, P. S. (2020). ESG rating disagreement and stock returns. ECGI Working Paper Series in Finance ESG (Vol. Working Pa).
- GIIN. (2018). Core Characteristics of Impact Investing, 2.
- Global Sustainable Investment Review. (2018). Global Sustainable Investment, and Alliance. Available at: <http://www.gsi-alliance.org/trends-report-2018/>
- Global Sustainable Investment Review. (2019). Global Sustainable Investment Review. Retrieved from <http://www.gsi-alliance.org/wp-content/uploads/2021/08/GSIR-20201.pdf>
- Global Sustainable Investment Review. (2020). 2018 Global Sustainable Investment Review. Retrieved from http://www.gsi-alliance.org/wp-content/uploads/2019/03/GSIR_Review2018.3.28.pdf
- Görge, M., Nerlinger, M., & Wilkens, M. (2017). Carbon Risk. SSRN, 1–59. <https://doi.org/10.2139/ssrn.2930897>
- Grantham Research Institute on Climate Change, LSE, & Initiative for Responsible Investment at the Harvard Kennedy School. (2018). Climate change and the just transition A guide for investor action. Retrieved from www.lse.ac.uk/GranthamInstitute/
- Guido, J. J., Winters, P. C., & Rains, A. B. (2006). Logistic Regression Basics. University of Rochester, 2006.
- Harnisch, J., Enting, K., & Ruffing, M. (2014). Linking climate targets and investment portfolios: Exploring the utility of cross-sectoral emission intensity indicators. *Carbon Management*, 5(5–6), 543–555. <http://doi.org/10.1080/17583004.2015.1040948>
- Henriksson, R., Livnat, J., Pfeifer, P., & Stumpp, M. (2019). Integrating ESG in Portfolio Construction. *The Journal of Portfolio Management*, 45(4), 67–81. <https://doi.org/10.3905/jpm.2019.45.4.067>
- Hernaus, A. (2019), "Exploring the strategic variety of socially responsible investment: Financial performance insights about SRI strategy portfolios", *Sustainability Accounting, Management and Policy Journal*, Vol. 10 No. 3, pp. 545-569. <https://doi.org/10.1108/SAMPJ-07-2018-0182>
- Hoepner, A. G. F., Oikonomou, I., Sautner, Z., Starks, L. T., & Zhou, X. (2019). ESG Shareholder Engagement and Downside Risk. AFA 2018 Paper, European Corporate Governance Institute – Finance Working Paper, No. 671/20(April). <https://doi.org/10.2139/ssrn.2874252>
- Hosmer, D. W., Jr., & Lemeshow, S. (2000). *Applied logistic regression* (2nd ed.). New York. Wiley
- Hübel, B., & Scholz, H. (2020). Integrating sustainability risks in asset management: the role of ESG exposures and ESG ratings. *Journal of Asset Management*, 21(1), 52–69. <https://doi.org/10.1057/s41260-019-00139-z>
- Hummel, K., & Szekely, M. (2021). Disclosure on the Sustainable Development Goals–Evidence from Europe. *Accounting in Europe*, 0(0), 1–38. <https://doi.org/10.1080/17449480.2021.1894347>
- Humphrey, J. E., & Tan, D. T. (2014). Does it Really Hurt to be Responsible? *Journal of Business Ethics*, 122(3): 375-386. <https://doi.org/10.1007/s10551-013-1741-z>

- Ibikunle, G., & Steffen, T. (2017). European Green Mutual Fund Performance: A Comparative Analysis with their Conventional and Black Peers. *Journal of Business Ethics*, 145(2), 337–355. <http://doi.org/10.1007/s10551-015-2850-7>
- Ivanisevic Hernaus, A. (2019). Exploring the strategic variety of socially responsible investment: Financial performance insights about SRI strategy portfolios. *Sustainability Accounting, Management and Policy Journal*, 10(3), 545–569. <https://doi.org/10.1108/SAMPJ-07-2018-0182>
- IPCC (2018). Special Report Global Warming of 1.5°C. www.ipcc.ch
- Janik, B., & Maruszewska, K. (2020). Valuation of the environmental effects of socially responsible investments in Europe. *Sustainability (Switzerland)*, 12(23), 1–20. <https://doi.org/10.3390/su12239855>
- Jansson, M., & Biel, A. (2011). Motives to engage in sustainable investment: A comparison between institutional and private investors. *Sustainable Development*, 19(2), 135–142. <http://doi.org/10.1002/sd.512>
- Jansson, M., Biel, A., Andersson, M., & Gärling, T. (2011). Investment Style and Perceived Drivers of Adoption of Socially Responsible Investment among Swedish Institutional Investors. *Journal of Investing*, 20(3): 118–123. <https://doi.org/10.3905/joi.2011.20.3.118>
- Junkus, J. C., & Berry, T. D. (2015). Socially responsible investing: a review of the critical issues. *Managerial Finance*, 41(11). <https://doi.org/10.1108/MF-12-2014-0307>
- Juravle, C., & Lewis, A. (2008). Identifying impediments to SRI in Europe: a review of the practitioner and academic literature. *Business Ethics: A European Review*, 17(3): 285–310. <https://doi.org/10.1111/j.1467-8608.2008.00536.x>
- Kempf, A., & Osthoff, P. (2007). The effect of socially responsible investing on portfolio performance. *European Financial Management*, 13(5), 908–922.
- Khan, M., Serafeim, G., & Yoon, A. (2015). Corporate Sustainability : First Evidence on Materiality. *The Accounting Review*, 91(6): 1697–1724. <https://doi.org/10.2308/accr-51383>
- Kim, C. S. (2019). Can Socially Responsible Investments Be Compatible with Financial Performance? A Meta-analysis. *Asia-Pacific Journal of Financial Studies*, 48(1), 30–64. <https://doi.org/10.1111/ajfs.12244>
- Koellner, T., Weber, O., Fenchel, M., & Scholz, R. (2005). Principles for Sustainability Rating of Investment Funds. *Business Strategy and the Environment*, 14: 54–70. <https://doi.org/10.1002/bse.423>
- Kölbl, J. F., Heeb, F., Paetzold, F., & Busch, T. (2020). Can sustainable investing save the world? Reviewing the mechanisms of investor impact. *Organization & Environment*, 33(4), 554–574.
- Kotsantonis, S., Pinney, C., & Serafeim, G. (2016). ESG Integration in Investment Management: Myths and Realities. *Journal of Applied Corporate Finance*, 28(2):10–16. <https://doi.org/10.1111/jacf.12169>
- Krech, R., Kickbusch, I., Franz, C., & Wells, N. (2018). Banking for health: The role of financial sector actors in investing in global health. *BMJ Global Health*, 3, 1–9. <https://doi.org/10.1136/bmjgh-2017->

- Krüger, P., Sautner, Z., & Starks, L. T. (2018). The Importance of Climate Risks for Institutional Investors. Swiss Finance Institute Research Paper Series, N°18-58.
- Kuzmina, J., & Lindemane, M. (2017). ESG Investing : New challenges and new opportunities. *Journal of Business Management*, (14): 85–99.
- Lagoarde-Segot, T., Sustainable finance. A critical realist perspective. *Research in International Business and Finance* (2018). <https://doi.org/10.1016/j.ribaf.2018.04.010>
- Lei, P.-W., & Koehly, L. M. (2000, April). "Linear discriminant analysis versus logistic regression: A comparison of classification errors". Paper presented at the annual meeting of the American Educational Research Association, New Orleans, LA <https://doi.org/10.1080/00220970309600878>
- Leite, P., & Cortez, M. C. (2014). Style and performance of international socially responsible funds in Europe. *Research in International Business and Finance*, 30(1), 248–267. <http://doi.org/10.1016/j.ribaf.2013.09.007>
- Lewis, A., & Juravle, C. (2010). Morals, markets and sustainable investments: A qualitative study of “champions. *Journal of Business Ethics*, 93(3): 483–494. <https://doi.org/10.1007/s10551-009-0235-5>
- Lopez, B. (2020). Connecting business and sustainable development goals in Spain. *Marketing Intelligence and Planning*, 38(5), 573–585. <https://doi.org/10.1108/MIP-08-2018-0367>
- Louche, C., Busch, T., Crifo, P., & Marcus, A. (2019). Financial Markets and the Transition to a Low-Carbon Economy: Challenging the Dominant Logics. *Organization and Environment*, 32(1), 3–17. <http://doi.org/10.1177/1086026619831516>
- Lozano, J. M., Albareda, L., & Balaguer, M. R. (2006). Socially Responsible Investment in the Spanish financial market. *Journal of Business Ethics*, 69, 305–316. <https://doi.org/10.1007/s10551-006-9092-7>
- Maiti, M. (2020). Is ESG the succeeding risk factor? *Journal of Sustainable Finance and Investment*, 1–15. <https://doi.org/10.1080/20430795.2020.1723380>
- Matallín-Sáez, J. C., Soler-Domínguez, A., Tortosa-Ausina, E., & de Mingo-López, D. V. (2019). Ethical strategy focus and mutual fund management: Performance and persistence. *Journal of Cleaner Production*, 213, 618–633. <http://doi.org/10.1016/j.jclepro.2018.12.130>
- Managi, S., Okimoto, T., & Matsuda, A. (2012). Do socially responsible investment indexes outperform conventional indexes? *Applied Financial Economics*, 22: 1511–1527. <https://doi.org/10.1080/09603107.2012.665593>
- Margolis, J. D., Elfenbein, H. A., & Walsh, J. P. (2007). "Does it pay to be good? A meta-analysis and redirection of research on the relationship between corporate social and financial performance". Working Paper, Harvard University.
- Martí-Ballester, C. P. (2019). Examining the financial performance of pension funds focused on sectors related to sustainable development goals. *International Journal of Sustainable Development and World Ecology*, 27(2), 179–191. <https://doi.org/10.1080/13504509.2019.1678532>

- Martí-Ballester, C.P (2021). Analysing the financial performance of sustainable development goals-themed mutual funds in China. *Sustainable Production and Consumption*, 27, 858–872. <https://doi.org/10.1016/j.spc.2021.02.011>
- Martínez-Ferrero, J., & Frías-Aceituno, J. V. (2015). Relationship between sustainable development and financial performance: International empirical research. *Business Strategy and the Environment*, 24(1), 20–39. <https://doi.org/10.1002/bse.1803>
- Méndez-Suárez, M., Monfort, A., & Gallardo, F. (2020). Sustainable banking: New forms of investing under the umbrella of the 2030 agenda. *Sustainability (Switzerland)*, 12(5), 1–13. <https://doi.org/10.3390/su12052096>
- Mgbame, C. O., Aderin, A., Ohalehi, P., & Chijoke-Mgbame, A. M. (2020). Achieving sustainability through environmental social governance reporting: Overcoming the challenges. *Advances in Environmental Accounting and Management*, 9, 9–25.
- Migliorelli, M. (2021). What do we mean by sustainable finance? Assessing existing frameworks and policy risks. *Sustainability (Switzerland)*, 13(2), 1–17. <https://doi.org/10.3390/su13020975>
- Miralles-Quirós, J. L., Miralles-Quirós, M. M., & Nogueira, J. M. (2020). Sustainable development goals and investment strategies: The profitability of using five-factor fama-french alphas. *Sustainability (Switzerland)*, 12(5), 1–16. <https://doi.org/10.3390/su12051842>
- Miralles-Quirós, J. L., Miralles-Quirós, M. M., & Nogueira, J. M. (2019). Diversification benefits of using exchange-traded funds in compliance to the sustainable development goals. *Business Strategy and the Environment*, 28(1), 244–255. <https://doi.org/10.1002/bse.2253>
- Moder, K., & Moder, K. (2010). Alternatives to F-Test in One Way ANOVA in case of heterogeneity of variances (a simulation study). *Psychological Test and Assessment Modeling*, 52(4), 343–353.
- Moon, J. (2007). The contribution of corporate social responsibility to sustainable development. *Sustainable Development*, 306(5): 296–306. <https://doi.org/10.1002/sd.346>
- Muhmad, S. N., & Muhamad, R. (2020). Sustainable business practices and financial performance during pre- and post-SDG adoption periods: a systematic review. *Journal of Sustainable Finance and Investment*, 0(0), 1–19. <https://doi.org/10.1080/20430795.2020.1727724>
- Nawaz, W., & Koç, M. (2018). Development of a systematic framework for sustainability management of organizations. *Journal of Cleaner Production*, 171, 1255–1274. <https://doi.org/10.1016/j.jclepro.2017.10.011>
- Niles, K., & Moore, W. (2021). Accounting for environmental assets as sovereign wealth funds. *Journal of Sustainable Finance and Investment*, 11(1), 62–81. <https://doi.org/10.1080/20430795.2019.1681618>
- Nilsson, J. (2009). Segmenting socially responsible mutual fund investors: The influence of financial return and social responsibility. *International Journal of Bank Marketing*, 27(1): 5–31. <https://doi.org/10.1108/02652320910928218>
- Nilsson, J., Nordvall, A. C., & Isberg, S. (2010). The information search process of socially responsible investors. *Journal of Financial Services Marketing*, 15(1): 5–18.
- Nofsinger, J., & Varma, A. (2014). Socially responsible funds and market crises. *Journal of Banking and Finance*, 48(509), 180–193. <http://doi.org/10.1016/j.jbankfin.2013.12.016>

- Orlitzky, M., Schmidt, F. L., & Rynes, S. L. 2003. Corporate social and financial performance: A meta-analysis. *Organization Studies*, 24(3): 403-441. <https://doi.org/10.1177/0170840603024003910>
- Orsato, R. J., Garcia, A., Mendes-Da-Silva, W., Simonetti, R., & Monzoni, M. (2015). Sustainability indexes: Why join in? A study of the “corporate sustainability index (ISE)” in Brazil. *Journal of Cleaner Production*, 96: 161-170. <https://doi.org/10.1016/j.jclepro.2014.10.071>
- Ortas, E., Moneva, J. M., Burritt, R., & Tingey-Holyoak, J. (2014). Does Sustainability Investment Provide Adaptive Resilience to Ethical Investors? Evidence from Spain. *Journal of Business Ethics*, 124, 297–309. <http://doi.org/10.1007/s10551-013-1873-1>
- Peng, C.-Y. J., Lee, K. L., & Ingersoll, G. M. (2002). An Introduction to Logistic Regression Analysis and Reporting. *The Journal of Educational Research*, 96(1): 3–14. <https://doi.org/10.1080/00220670209598786>
- Przychodzen, J., Gómez-Bezares, F., Przychodzen, W., & Larreina, M. (2016). ESG Issues among fund managers—Factors and motives. *Sustainability*, 8(10): 1078. <https://doi.org/10.3390/su8101078>
- Puaschunder, J. M. (2015). On the emergence, current state and future perspectives of Socially Responsible Investment (SRI). *Annals in Social Responsibility*, 16(617): 38–63. <https://doi.org/10.3390/su8101078>
- PWC. (2017). The SDG Investment Case. Retrieved from https://www.unpri.org/download_report/42251
- PWC. (2020). PWC-ESG Report. The growth opportunity of the century. Retrieved from www.pwc.lu/esg-report
- Renneboog, L., Ter Horst, J., & Zhang, C. (2008). Socially responsible investments: Institutional aspects, performance, and investor behavior. *Journal of Banking and Finance*, 32: 1723–1742. <https://doi.org/10.1016/j.jbankfin.2007.12.039>
- Renneboog, L., Ter Horst, J., & Zhang, C. (2008). The price of ethics and stakeholder governance: The performance of socially responsible mutual funds. *Journal of Corporate Finance*, 14(3), 302–322. <http://doi.org/10.1016/j.jcorpfin.2008.03.009>
- Revelli, C. (2017). Socially responsible investing (SRI): From mainstream to margin? *Research in International Business and Finance*, 39, 711–717. <http://doi.org/10.1016/j.ribaf.2015.11.003>
- Revelli, C., & Viviani, J. L. (2015). Financial performance of socially responsible investing (SRI): What have we learned? A meta-analysis. *Business Ethics: A European Review*, 24(2): 158-185. <https://doi.org/10.1111/beer.12076>
- Ritchie, J., & Dowlatabadi, H. (2015). Divest from the Carbon Bubble ? Reviewing the Implications and Limitations of Fossil Fuel Divestment for Institutional Investors. *Review of Economics and Finance*, 5(2), 59–80. Retrieved from <http://blogs.ubc.ca/dowlatabadi/welcome/>
- Rizzello, A., & Kabli, A. (2020). Sustainable financial partnerships for the SDGs: The case of social impact bonds. *Sustainability (Switzerland)*, 12(13). <https://doi.org/10.3390/su12135362>

- Romano, M., Cirillo, A., Favino, C., & Netti, A. (2020). ESG (Environmental, social and governance) performance and board gender diversity: The moderating role of CEO duality. *Sustainability (Switzerland)*, 12(21), 1–16. <https://doi.org/10.3390/su12219298>
- Rosati, F., & Faria, L. G. D. (2019). Addressing the SDGs in sustainability reports: The relationship with institutional factors. *Journal of Cleaner Production*, 215, 1312–1326. <https://doi.org/10.1016/j.jclepro.2018.12.107>
- Roy, J., Some, S., Das, N., & Pathak, M. (2021). Demand side climate change mitigation actions and SDGs: Literature review with systematic evidence search. *Environmental Research Letters*, 16(4). <https://doi.org/10.1088/1748-9326/abd81a>
- Saadaoui, K., & Soobaroyen, T. (2018). An analysis of the methodologies adopted by CSR rating agencies. *Sustainability Accounting, Management and Policy Journal*, 9(1), 43–62. <https://doi.org/10.1108/SAMPJ-06-2016-0031>
- Sandberg, J. (2011). Socially Responsible Investment and Fiduciary Duty: Putting the Freshfields Report into Perspective. *Journal of Business Ethics*, 101(1), 143–162. <http://doi.org/10.1007/s10551-010-0714-8>
- Sandberg, J. (2013). (Re-)interpreting fiduciary duty to justify socially responsible investment for pension funds? *Corporate Governance: An International Review*, Vol. 21, Issue 5, pp. 436–446. <http://dx.doi.org/10.1111/corg.12028>
- Sandberg, J., Juravle, C., Hedesström, T. M., & Hamilton, I. (2009). The heterogeneity of socially responsible investment. *Journal of Business Ethics*, 87(4): 519–533. <https://doi.org/10.1007/s10551-008-9956-0>
- Scheyvens, R., Banks, G., & Hughes, E. (2016). The Private Sector and the SDGs: The Need to Move Beyond 'Business as Usual.' *Sustainable Development*, 24(6), 371–382. <https://doi.org/10.1002/sd.1623>
- Shiller, R. J. (2013). Capitalism and financial innovation. *Financial Analysts Journal*, 69(1): 21–25. <https://doi.org/10.2469/faj.v69.n1.4>
- Schoenmaker, D., & Van Tilburg, R. (2016). What Role for Financial Supervisors in Addressing Environmental Risks? *Comparative Economic Studies*, 58(3), 409–429. <http://doi.org/10.1057/s41294-016-0002-4>
- Scholtens, B., & Sievänen, R. (2013). Drivers of Socially Responsible Investing: A Case Study of Four Nordic Countries. *Journal of Business Ethics*, 115(3): 605–616. <https://doi.org/10.1007/s10551-012-1410-7>
- Schramade, W. (2017). Investing in the UN Sustainable Development Goals: Opportunities for Companies and Investors. *Journal of Applied Corporate Finance*, 29(2), 87–99. <https://doi.org/10.1111/jacf.12236>
- Schütze, F., Fürst, S., Mielke, J., Steudle, G. A., Wolf, S., & Jaeger, C. C. (2017). The role of sustainable investment in climate policy. *Sustainability (Switzerland)*, 9(12), 1–19. <https://doi.org/10.3390/su9122221>
- Seitanidi, M. M. (2007). Intangible economy: how can investors deliver change in businesses? *Management Decision*, 45(5): 853–865. <https://doi.org/10.1108/00251740710753675>

- Semenova, N., & Hassel, L. G. (2015). On the Validity of Environmental Performance Metrics. *Journal of Business Ethics*, 132(2), 249–258. <https://doi.org/10.1007/s10551-014-2323-4>
- SFDR (2019): Regulation (EU) 2019/2088 of the European Parliament and of the Council of 27 November 2019 on sustainability-related disclosures in the financial services sector. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32019R2088>
- Shiller, R. J. (2013). Capitalism and financial innovation. *Financial Analysts Journal*, 69(1): 21–25. <https://doi.org/10.2469/faj.v69.n1.4>
- Sievanen, R., Rita, H., & Scholtens, B. (2017). European Pension Funds and Sustainable Development: Trade-Offs between Finance and Responsibility. *Business Strategy and the Environment*, 26(7): 912–926. <https://doi.org/10.1002/bse.1954>
- Silva, F., & Cortez, M. C. (2016). The performance of US and European green funds in different market conditions. *Journal of Cleaner Production*, 135, 558–566. <http://doi.org/10.1016/j.jclepro.2016.06.112>
- Statman, M. (2000) Socially responsible indexes. *Journal of Portfolio Management*, 32: 100–108. <https://doi.org/10.3905/jpm.2006.628411>
- Tabachnick BG., & Fidell LS. (2007). *Using Multivariate Statistics*, 5th ed. Allyn and Bacon: Boston.
- Tolliver, C., Keeley, A. R., & Managi, S. (2019). Green bonds for the Paris agreement and sustainable development goals. *Environmental Research Letters*, 14(6). <https://doi.org/10.1088/1748-9326/ab1118>
- Townsend, B. (2020). From SRI to ESG: The Origins of Socially Responsible and Sustainable Investing. *The Journal of Impact and ESG Investing*, 1(1).
- Trinks, A., Scholtens, B., Mulder, M., & Dam, L. (2018). Fossil Fuel Divestment and Portfolio Performance. *Ecological Economics*, 146, 740–748. <http://doi.org/10.1016/j.ecolecon.2017.11.036>
- Trinks, P. J., & Scholtens, B. (2017). The Opportunity Cost of Negative Screening in Socially Responsible Investing. *Journal of Business Ethics*, 140(2), 193–208. <http://doi.org/10.1007/s10551-015-2684-3>
- Valor, C., de la Cuesta, M., & Fernandez, B. (2009). Understanding Demand for Retail Socially Responsible Investments: A Survey of Individual Investors and Financial Consultants. *Corporate Social Responsibility and Environmental Management*, 16: 1–14. <https://doi.org/10.1002/csr.172>
- Van Duuren, E., Plantinga, A., & Scholtens, B. (2016). ESG Integration and the Investment Management Process: Fundamental Investing Reinvented. *Journal of Business Ethics*, 138(3). <http://doi.org/10.1007/s10551-015-2610-8>
- van Zanten, J. A., & van Tulder, R. (2018). Multinational enterprises and the Sustainable Development Goals: An institutional approach to corporate engagement. *Journal of International Business Policy*, 1(3–4), 208–233. <https://doi.org/10.1057/s42214-018-0008-x>
- Vargha, A., & Delaney, H. D. (1998). The Kruskal-Wallis Test and Stochastic Homogeneity. *Journal of Educational and Behavioral Statistics*, 23(2), 170–192. <http://doi.org/10.3102/10769986023002170>

- von Wallis, M., & Klein, C. (2015). Ethical requirement and financial interest: a literature review on socially responsible investing. *Business Research*, 8(1), 61–98. <http://doi.org/10.1007/s40685-014-0015-7>
- Wang, N., Lund Larsen, M., & Wang, Y. (2020). Addressing the missing linkage in sustainable finance: the 'SDG Finance Taxonomy.' *Journal of Sustainable Finance and Investment*, 0(0), 1–8. <https://doi.org/10.1080/20430795.2020.1796101>
- Weber, O., Diaz, M., & Schwegler, R. (2012). Corporate Social Responsibility of the Financial Sector – Strengths, Weaknesses and the Impact on Sustainable Development. *Sustainable Development*, 335(May 2012), 321–335. <https://doi.org/10.1002/sd.1543>
- Woods, C. (2009). "Funding Climate Change : how pension fund fiduciary duty masks trustee inertia and short-termism". Working Papers in Employment, Work and Finance. School of Geography and Environment (University of Oxford), pp. 1–30. Working paper.
- Woods, C., & Urwin, R. (2010). Putting sustainable investing into practice: A governance framework for pension funds. *Journal of Business Ethics*, 92(1), 1-19.
- Weyzig, F., Kuepper, B., Van Gelder, J. W., & Van Tilburg, R. (2014). The Price of Doing Too Little Too Late. *Green New Deal Series*, 11, 61. Retrieved from www.gef.eu
- Widyawati, L. (2020). A systematic literature review of socially responsible investment and environmental social governance metrics. *Business Strategy and the Environment*, 29(2), 619–637. <https://doi.org/10.1002/bse.2393>
- Yoshino, N., Taghizadeh-Hesary, F., & Otsuka, M. (2021). Covid-19 and Optimal Portfolio Selection for Investment in Sustainable Development Goals. *Finance Research Letters*, 38(July 2020), 101695. <https://doi.org/10.1016/j.frl.2020.101695>

Appendix. SELF ADMINISTERED SURVEY

We should be very grateful if you would answer the following questions. Our aim is to understand how Asset Management Companies include corporate social responsibility (CSR) policies and ESG criteria in the managing and marketing of their investment funds.

The following questions will take up very little of your time. Any information obtained will be treated with utmost confidentiality and recorded anonymously. Data will be used only in a global manner and not as individual information.

If you should need any further clarification or have any questions whatsoever, please do not hesitate to contact the following email address: mfolque@fundspeople.com

Name of the Company:

Characteristics of the Asset Management Company

1. Nationality

- a) Belgian
- b) British
- c) Dutch
- d) French
- e) German
- f) Italian
- g) Spanish
- h) Europe others
- i) American
- j) Japanese
- k) Other

2. Countries where funds are distributed

- a) Domestic distribution only
- b) Transnational
 - (1) Fewer than three countries
 - (2) Between three and five countries
 - (3) More than five countries

3. The company can be defined as

- a) Generalist
- b) SRI specialist

4. Assets under management

- a) Up to 5.000 bn euros
- b) 5.000-20.000 bn euros
- c) 20.000-50.000 bn euros

- d) 50.000-100.000 bn euros
- e) More than 100.000 bn euros

5. Ownership Structure. The Company

- a) Is independent
- b) Belongs to a bank
- c) Belongs to an insurance company
- d) Other

Corporate Social Responsibility (CSR) policy

6. Does the company have a written CSR policy?

- a) Yes, since when? _____
- b) No
- c) No, but it's going to be implemented

7. Which are (or would be) the main reasons to adopt a CSR policy in your company? Please choose two answers.

- a) Compliance with actual and/or future regulations.
- b) Fulfilling investors' demand
- c) Coherence with the strategy of the company
- d) Internal pressures from some stakeholders (such as directives, managers or employees)
- e) It is a general trend in the industry.
- f) Other

8. Is the company following or implementing any of these Codes or certificates?

- a) Best Practices on CSR
- b) Good Governance Code
- c) SA 8000 Certificate (on job relations)
- d) Others
- e) No

9. Is the company a signatory of UNPRI (United Nations Principles of Responsible Investments)?

- a) Yes (please go to next question 10)
- b) No (please go to question 11)
- c) No, but the company is considering to become a signatory. (Please go to question 11)

10. What was the company's score in the last review by UNPRI?

11. Does the company have a Head of CSR?

- a) Yes
- b) No

12. Does the company report to stakeholders on its CSR policies and practices?

- a) No

- b) Yes, via Newsletter
- c) Yes, through the Web
- d) Yes, in meetings and conferences
- e) Others

Management and distribution of Socially Responsible Investments Funds (SRI Funds)

13. Does the company manage or distribute SRI Funds?

- a) Yes; indicate the number of funds _____ (please go to question 14)
- b) No (please go to question 17)
- c) No, but the company is planning to launch them soon (please go to question 17)

14. SRI Funds assets under management (AUM) by the end of 1H 2016

15. SRI Funds AUM relative to total AUM

16. SRI Funds AUM growth within the total AUM in the last five years?

- a) Less than 20%
- b) 20% -40%
- c) 40% - 60%
- d) 60% - 80%
- e) Over 80%

17. Which are the main reasons to distribute or to start distributing SRI Funds?

Please choose two answers

- a) SRI Funds are demanded by institutional investors
- b) SRI Funds are demanded by retail investors
- c) Client mandates
- d) SRI Funds long term returns
- e) SRI Funds are less risky
- f) Coherence with the philosophy and strategy of the company.
- g) It is a trend in the market
- h) Other

SRI Funds characteristics (Please, answer this bloc only if the company manages or distributes SRI Funds)

18. Who is responsible of defining the SRI guidelines of the funds?

- a) Investment committee
- b) Ethic committee
- c) The Fund manager
- d) SRI head of the company
- e) External advisors
- f) Others

19. Asset classes in which SRI Funds are invested

- a) Equity
- b) Fixed Income
- c) Multi-asset
- d) All of them
- e) Other

20. Which criteria have been considered for the selection of the benchmark for SRI Funds?

- a) Incorporation of specific environmental, social or governance (ESG) aspects
- b) Accurate representation of the region/sector where the SRI Fund is investing in
- c) Consistency with the Fund investment policy
- d) Integration of ESG criteria in the investment approach
- e) Other

21. Which of the following strategies mainly guide the portfolio construction of the SRI Funds in your company?

- a) Negative screening
- b) Norm -based exclusion
- c) Positive screening
- d) Best in class
- e) ESG integration
- f) Sustainability Themed
- g) Sector based exclusion
- h) Engagement and voting

22. If you choose “negative screening” to question 22, could you please indicate the activities and products avoided?

- a) Tobacco
- b) Gambling -related activities
- c) Weapons
- d) Alcohol
- e) Nuclear energy
- f) Human rights violation, child labour and totalitarian regimes
- g) Animal testing or fur trading
- h) Other

23. In general terms, which are the most relevant issues in the design of SRI Funds?

- a) Financial issues
- b) Environmental issues
- c) Social issues
- d) Governance issues
- e) Both ESG and financial issues

24. Type of information offered to investors in SRI Funds

- a) Mainly Financial information
- b) Mainly ESG issues information
- c) Financial and ESG issues information

25. How often investors receive information about ESG issues?

- a) Yearly
- b) Quarterly
- c) Monthly
- d) Timely information
- e) Not on a regular basis

26. Where is the information made available?

- a) It is public on detailed reports
- b) It is public on annual reports
- c) It is public on the Website
- d) It is public to anyone who request it
- e) Not public information is offered
- f) Other -----

27. Do you have any kind of control of ESG issues after the investment is made?

- a) Sí
- b) No

Financial and extra financial risks management

28. In risk terms, when compared with traditional investment funds, SRI Funds are generally

- a) Less risky than traditional Funds
- b) Not different than traditional Funds
- c) Riskier than traditional Funds

29. Do you consider that the “management of extra financial risks” is a critical issue?

- a) No
- b) Yes, it is a competitive advantage
- c) Yes, in compliance with actual regulations
- d) Yes (other reasons)

30. In your company, is the portfolio's extra financial risk measured? (Materiality of SRI issues)

- a) Yes (please go to question 32)
- b) No (please go to question 36)
- c) No, but we are considering to integrate the analysis of extra financial risks in the near future. (Please go to question 36)

31. In your company, how is the portfolio's extra financial risk measured?

- (a) Proprietary methodology
- (b) The company outsources the measurements (for example to rating agencies)
- (c) Other

32. Which ESG ratings and measures are used to monitor ESG issues?

33. Obtaining the information needed to measure extra financial risks is

- (a) Very easy
- (b) Easy
- (c) Difficult
- (d) Very difficult

34. Which extra financial risks are considered in the portfolio construction?

- a) Environmental risks
- b) Social risks
- c) Governance risks
- d) Legal risks
- e) Reputational risks
- f) It depends on the sector in which we are investing
- g) Other

Communication with Investors

35. What type of investors demand SRI Funds?

- a) Retail investors
- b) Wealth investors
- c) Institutional investors
 - a. Banks
 - b. Asset management companies
 - c. Insurance companies
 - d. Family Offices
 - e. Pension Funds
 - f. Sovereign Funds
- d) Professional Associations
- e) Religious groups
- f) NGO's, Foundations, etc.

36. In your view, which are the main reasons that lead investors to SRI Funds?

- a) Financial returns
- b) Ethical or religious reasons
- c) Personal values (for example, concerns about environmental issues)
- d) It is safer to invest in sustainable companies
- e) Financial institution advice
- f) Other

37. Does the company use a "best advice" system to help choose SRI Funds?

- a) No
- b) Yes, education programs
- c) Yes, Product Specialist
- d) Other

38. Do you use an specific questionnaire for SRI Funds?

- a) Sí
- b) No

39. Do you consider that investments in SRI Funds have experienced more growth after the financial crisis?

- a) Yes
- b) No

Engagement

40. Does your company have a formal engagement policy?

- a) Yes
- b) No(you have finished, thank you)
- c) No, but it is planning to implement it (you have finished, thank you)

41. Which of the following themes does your company 'engage' with investee companies on?

- a) Financial issues
- b) Social Issues
- c) Environmental issues
- d) Governance issues

42. What engagement and dialogue practices do you use?

- a) Questions at Annual General Meeting (AGM)
- b) Dialogue with CEO'S and directives
- c) Voting policies
- d) Disinvestment in companies
- e) Collaborative engagement with other investors
- f) Filling Resolutions

