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# ARE sustainable funds doing the talk and the walk? An ESG score analysis of fund portfolio holdings

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## ABSTRACT

Our paper contributes to the growing literature by conducting a comparative analysis between sustainable funds (SF) and conventional funds (CF) with a global geographical perspective. The paper aims to test if SF are true to their identity through a comparative and multi-regional perspective analysis of the funds' ESG performance and sustainability risk. The sample comprises 92 matched pairs of funds. Our research shows that self-labeled sustainable funds exhibit better ESG performance and sustainability risk scores than their pairs, indicating alignment with their identity and nature. Furthermore, the results also indicate that there are different ESG behaviors depending on the geographical areas of investment. In particular, funds with portfolios invested in Europe present a higher ESG performance than those invested in North America, and funds invested in Emerging Markets and Asia present a lower performance and higher risk than those in North America. This paper provides three main novelties: 1) multiregional perspective, 2) different ESG score perspectives using different and complementary indicators of sustainable behavior based on risk and performance, and 3) a matching process starting with the same fund management company, geographical area of investment and investment category that help us isolate the issue of the use of ESG labels. The results of this paper open new insights and research avenues that connect sustainable investment with aspects like quality of information, fiduciary duty, and regulatory development.

## 1. Introduction

Socially Responsible Investments (thereafter SRI) have grown exponentially, moving from a niche to mainstream, going into a quest for profitability (Revelli, 2017). The growth has been supported by regulation and institutional investors' pledges to achieve a Net-Zero Economy. Influenced by these interests and attention, investment management companies have rushed to satisfy the demand by creating new targeted funds and reacting to the threat of passive funds. Due to the impressive growth, concerns have arisen regarding Sustainable Funds (thereafter SF) performance, characteristics, and market motivations.

At first, practitioners and academics focused their debate primarily on SRI and their financial performance. Do sustainable investors sacrifice performance to be good? The issue has been debated extensively. The most recent literature reviews and meta-analyses indicate that Environment, Social, and Governance (thereafter ESG) considerations do not imply strength or weakness and both

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types of funds show similar performance (Capelle-Blancard & Monjon, 2012; Chegut et al., 2011; Hoepner & McMillan, 2009; Hornuf & Yüksel, 2023; Junkus & Berry, 2015; C. S. Kim, 2019; Martinez-Meyers et al., 2023; Rathner, 2013; Renneboog, Horst, & Zhang, 2008; Revelli & Viviani, 2015; von Wallis & Klein, 2015).

Therefore, after the results from the financial performance debate, the conversation shifts to new topics, prompting new questions. Do sustainable funds portfolios differ from conventional funds (thereafter CF)? Are funds self-labeled as “sustainable” better in terms of ESG scores as compared to their conventional counterparts? Or are they using sustainability as a marketing tool to appear more attractive under the growing ESG interest? Are they genuinely committed to sustainable investing or engaging in “greenwashing” tactics by “greening” their names? Could the region of the investment potentially impact the answers to these questions?

The paper aims to test if SF funds are true to their identity through a comparative and multi-regional perspective analysis of the funds’ ESG scores using two proxies: ESG performance (Refinitiv database) and sustainability risk (Morningstar database). We will empirically test a multi-region representative sample of pairs of funds composed of self-labeled sustainable funds and their conventional equivalents, found using a five-criteria “matched pair” approach (same investment company, geographical area of investment, investment size and style, size, and age of the fund).

Our research has identified a gap in the existing literature as there has been mixed evidence on the link between SF and their ESG performance and risk. In contrast with the previous literature review, where a majority of papers were focused on US-based funds, we proposed a multi-regional approach that, to our knowledge, has not been tested from the ESG performance and risk perspective. The minority of papers that have utilized a multi-regional sample have taken different perspectives. For example, Nitsche and Schröder (2018) focused on the top ten holdings, while Gibson Brandon, Glossner, Krueger, Matos, and Steffen (2022) tested PRI signatories rather than self-labeled funds.

To address the doubts and skepticism raised by practitioners, academics, and regulators such as the EU Commission (2019), the ESMA (2023), and SEC (2023), our paper contributes to the growing literature investigating the ESG commitment of SF. We do so by using ESG scores of portfolio holdings. Our research paper is novel as it is the first to analyze, up to our knowledge, the issue of ESG scores of ESG self-labeled funds from multiple geographical perspectives. We use different sustainability measurement perspectives: ESG performance from Refinitiv and sustainability risk from Morningstar. Our matching process includes the same fund management company, geographical area of investment, and Morningstar investment category. Our research shows that self-labeled sustainable funds exhibit better ESG performance and sustainability risk scores, indicating alignment with their identity and nature. Furthermore, our results also indicate that there are different ESG behaviors depending on the geographical areas of investment. In particular, the paper finds evidence of better behavior of European funds, which could be explained by the strong commitment of European Institutions to sustainable finance.

The paper is structured as follows: after this introductory section, Section 2 elaborates our hypotheses using the frameworks and debates around the potential “untrue” and “true” nature of SF and the impact of institutional pressure on sustainable finance development; methodology and data collection are detailed in Section 3, while Section 4 presents our findings. Section 5 discusses the findings, and Section 6 presents our main conclusions.

## 2. Theoretical BACKGROUND and hypothesis

The increased social pressure has moved companies from the classical shareholder approach (Milton Friedman, 1970) to the demanded by society stakeholder approach (Donaldson & Preston, 1995; Freeman & Cavusgil, 1984) and toward an increase in the disclosure of non-financial information. However, some companies use ESG disclosure to create a public impression of environmental responsibility despite poor ESG performance (Furlow, 2010; Ramus & Montiel, 2005). Furthermore, some companies engage in selective disclosure, which has been linked with greenwashing (Lyon & Maxwell, 2011; Marquis et al., 2016).

Concerns about greenwashing and rainbow washing (linked to Sustainable Development Goals) have increased after the growth explosion of the sector. This growth has also been supported by Covid-19 (Crabb, 2020). The concerns about greenwashing have also affected the investment community. SF use specific screening criteria to measure companies’ extra-financial performance based on the corporate ESG data. The lack of standard definitions used for screening, measures, or requirements has been defined as one of the main barriers to SRI investing. Therefore, it is hard to measure if SRI-labeled funds are genuine, transparent, and are, in fact, ethical, which is not always the case (Schwartz, 2003).

Academic research has focused on the performance of SF when these funds have a secondary objective, which is to comply with ethical principles (Capelle-Blancard & Monjon, 2012; Utz & Wimmer, 2014). It is worth noting that SRI investors may be “value-driven” (Muñoz, 2016), and they obtain a utility by adhering to investments that are consistent with a set of personal values or societal concerns (Bollen, 2007). Some investors may even have disutility or negative feelings toward holding “brown” firms (Pástor et al., 2021). Therefore, potential misclassifications or mis-selling of SF could lead to a potential agency problem. Some investment funds could be tempted to use “SRI,” “green,” “Sustainable,” or “ESG” labels as a marketing tool without being fully supported. Kaustia and Yu (2021) observed the effect of the ESG label as ESG funds attracted higher flows even with inferior Morningstar Global ratings. Białkowski and Starks (2016) observed a similar effect of flow for SF that they attributed to the investor’s nonfinancial considerations.

There has been an increase in repurposing of funds to make them greener. Bioy, Stuart, Boyadzhiev, Pettit, and Alladi (2020) published in Morningstar that in 2020, the repurposed funds could represent between 10 and 20% of the sustainable fund universe. Ghoul and Karoui (2020) found that frequent name changes include the words “sustainable,” “ESG,” “green,” and “impact.” They were observed to be beneficial for funds flows and in their sample, were not cosmetic changes as they were accompanied, on average, by a portfolio rebalancing. In a study conducted in 2023, Li et al. tested whether US ESG funds, managed by fund managers overseeing active non-ESG funds (referred to as non-ESG sibling funds), had a positive ESG spillover effect. They found that portfolios of non-ESG

**Table 1**  
Summary of Literature Review meter borges, li nuevas referencias

| AUTHOR                       | PERIOD & SOURCE OF DATABASE | SOURCE ESG SCORES                           | MATCHED PAIR APPROACH | MAIN HYPOTHESIS TESTED   | RESULTS   | RESULTS UNTRUE NATURE OF SRI FUNDS (1 yes, 0 no) |
|------------------------------|-----------------------------|---|-----------------------|--|---|--|
| Benson et al. (2006)         | 94-2003 USA                 | Not used                                    | No                    | Are SRI funds investing in stocks that, in an aggregated, look any different from CF?  | Different industry betas which are consistent with different portfolios   | 0  |
| Kempf and Osthoff (2008)     | 91-2004 USA                 | KLD Rating                                  | No                    | Do SRI funds have higher ethical ranks than CF?  | The study shows that US SRFs have a significantly higher ethical ranking than CF and should not be considered conventional funds in disguise.   | 0  |
| Utz and Wimmer (2014)        | 2002–2012 USA               | Asset 4 (Reuters), Bloomberg                | No                    | Do SRFs are higher if ranked by ESG scores? Do SRF show higher ESG scores than CF?   | SRI mutual funds were not holding considerably more ethical assets on average, and they did not guarantee the exclusion of unethical firms.   | 1  |
| Borgers et al. (2015)        | 2004–2012 USA               | MSCI  | No                    | What explains differences in mutual funds' exposure to controversial companies? Does exposure to controversial stocks drive fund returns?  | SRI funds have a weaker exposure to socially sensitive stocks   | 0  |
| Bialkowski and Starks (2016) | 1999–2011 USA               | MSCI  | Yes                   | Do SRI funds have more stringent ESG profiles than conventional funds? And is it persistent through time?  | They found that US domestic funds had higher positive exposure to MSCI ESG categories   | 0  |
| Joliet and Titova (2018)     | 2009–2015 USA               | Sustainalytics                              | Yes                   | Do SRFs tend to invest in co with higher ESG scores?   | ESG performance of portfolio companies is, on average, higher for SRF, which is especially true for U.S.-focused funds.   | 0  |
| Nitsche and Schröder (2018)  | 2012 Global                 | Oekom, Sustainalytics and Asset 4 (Reuters) | No                    | Are the top 10 fund holdings of SRF different from the holdings of CF? Do SRF have higher ESG rankings than CF? If SRF has higher ESG rankings, are the absolute rating differences statistically significant? | The results show that the Top 10 portfolio holdings of both fund types have overlaps; however, SRF obtains, on average, better ESG rankings than CF, which are statistically significant.   | 0  |
| Gangi and Varrone (2018)     | 2009–2014 Europe            | Reuters                                     | No                    | Do the companies selected by SRF exhibit better CSP than companies selected by CF? Do co-selected by SRF exhibit worse CSP than co-selected by CF?   | Results show that firms held by SRFs exhibit poorer CSP than firms selected by CFs.   | 1  |
| S. Kim & Yoon, 2020          | 2006–2018 USA               | MSCI, Sustainalytics, and TruValue Labs     | Yes                   | Do funds experience changes in the flows after signing PRI? Do signatories change portfolio holdings to incorporate ESG?   | Signatories show an improved fund flow after signing, and PRI funds, on average, do not improve ESG fund scores after signing and they vote less on environmental issues, and their stock holdings experience increased environment-related controversies | 1  |
| Alda (2020)                  | 2016–2018 UK                | Morningstar                                 | Yes                   | Do SR pension funds present higher ESG scores than Conventional pension funds?   | Results show that SRF presents higher scores than CF. They observe a greater concern about environmental issues in SRF  | 0  |
| Kaustia & Yu (2021)          | 2016–2020 USA               | Morningstar                                 | Yes                   | Do Self-labeled ESG receive higher inflows? What drives the decision to repurpose a fund into an ESG fund? What occurs to funds after repurposing?   | They observed that mutual fund companies are likely to attach an ESG label to funds with lower flows. On the other hand, repurposed funds exhibited a reduction to ESG unfriendly sector.   | 1  |
| Abouarab et al. (2022)       | 2011–2021 USA               | Refinitiv                                   | Yes                   | Do Sustainable Funds respond to announcements of commitments to decarbonization?   | The results show that Sustainable Funds fail to reduce their carbon footprint   | 1  |

(continued on next page)

Table 1 (continued)

| AUTHOR                       | PERIOD & SOURCE OF DATABASE | SOURCE ESG SCORES             | MATCHED PAIR APPROACH | MAIN HYPOTHESIS TESTED                               | RESULTS   | RESULTS UNTRUE NATURE OF SRI FUNDS (1 yes, 0 no) |
|------------------------------|-----------------------------|-------------------------------|-----------------------|--|---|--|
| Gibson Brandon et al. (2022) | 2003–2017 Global            | Asset 4, MSCI, Sustainalytics | Yes                   | Do signatories of the PRI exhibit better ESG scores? | vs the matched conventional funds<br>Results are mixed depending on the geography. They observe that US-domiciled signatories have similar or worse scores and fail their responsible investment commitments. | 1  |
| Muñoz et al. (2022)          | US, 2007–2018               | Refinitiv                     | No                    | Do SRI funds engage on window dressing?              | SRI funds do not manipulate the information they disclose in order to attract money flows   | 0  |

sibling funds demonstrated higher ESG scores than standalone funds.

In this move towards the mainstream, fund managers are moving to an ESG integration approach (Alda, 2020; Revelli, 2017), with several of the most significant investment fund companies (Blackrock, Fidelity, Deutsche Bank ...) declaring that no specific funds but their whole platform will be managed using this approach. This evolution makes sense as these large institutional investors can be categorized as universal owners where their performance is linked to the overall state of the markets and the economy. As a reference, we have the release of the Corporate Governance Code of the Norway Sovereign Wealth Fund as an example of low-cost activism with strong firm influence (Aguilera et al., 2019).

However, some doubts have arisen about some of these large investors. Fidelity appeared on the publication of a report on greenwashing by the wealth manager SCM Direct and after the financial press echoed the information. Fidelity has commented that due to a mistake or “glitch” in the Fidelity filtering tool, 49 of its own funds appeared to be branded as “SRI” when only one fund of the whole list fell under this category. These funds were sold to customers under this consideration, and now Fidelity is considering if they may have to compensate clients for this misdealing categorization. In the case of Deutsche Bank, US authorities announced in the summer of 2021 that they were investigating DWS (asset management branch of Deutsche Bank) for a potential overstating of their sustainable investment efforts and the amount of assets invested using an ESG integration approach. The Securities Exchange Commission (SEC) finally fined the company \$25 million in September 2023 for material misleading statements linked to their ESG products and failure in some policies related to money laundering.

## 2.1. Sustainable funds and their true identity

Due to the increasing concerns, academic researchers have dwelled on this topic, obtaining mixed results. In the succeeding sections, we categorize the literature review into two sets: papers that raise concerns around greenwashing and the true identity of sustainable funds and papers that support the true nature of SF.

### 2.1.1. Un-true identity of sustainable funds

In addition to recent market references, a number of academic papers have raised concerns about this issue. S. Utz and Wimmer (2014) analyzed SF holdings selected from the US Sustainable Investment Forum (SIF) database. The authors found that the label “Social Responsible Fund” does not always guarantee the exclusion of unethical firms and could be more of a marketing tool than a guarantee. Gangi and Varrone (2018) found that firms in SF’s holdings exhibit poorer Corporate Social Performance and achieve lower risk-adjusted returns than those in CF’s holdings, raising a potential agency conflict. Looking at the exposure of SF to indices, Leite and Céu Cortez (2014) found in their sample of international funds that SF were more exposed to conventional indices than to socially responsible specific indices. Kaustia & Yu (2021) discovered that mutual fund families are likelier to attach an ESG label to funds with lower flows. This ESG repurposing could be linked to greenwashing strategies. On the other side, repurposed funds studied exhibited a reduction in exposure to ESG-unfriendly industries such as Oil and Gas. Abouarab et al. (2022) examined the decarbonization of US funds and found that the carbon footprint of the Sustainable Fund portfolio increased during the event window analyzed.

Academics have used adherence to the United Nations Principles for Responsible Investment (PRI) as a measure of a company’s ESG commitment. A study by Gibson Brandon et al. (2022) has suggested that investors who sign the PRI exhibit a better ESG footprint. However, the study also found that US-based companies had a worse performance, which could indicate the presence of greenwashing. In another study, Kim and Yoon (2020) found that companies that signed the PRI (Principles for Responsible Investment) did not show any improvements in their ESG fund score after endorsement. Additionally, these companies addressed fewer votes related to environmental issues and faced increased environmental controversies in their holdings. This suggests that PRI signatories may have weaker engagement with environmental issues compared to non-signatories. Liang et al. (2020) found that 20.79% of PRI signatory hedge funds had lower ESG scores than the median Hedge Fund.

### 2.1.2. True identity of sustainable funds

In contrast, certain academic research findings have shown that SF are consistent with their identity and nature. For instance, [Benson et al. \(2006\)](#) observed that SF displayed different industry betas consistent with different portfolio allocations. Moreover, [Kempf and Osthoff \(2008\)](#) found that US SRI Equity funds exhibit higher ethical standards, which suggests that they are not just ethical funds in disguise. In line, [Borgers et al. \(2015\)](#) observed that US SRI equity funds avoided core sin industries. Academics have also tested for window dressing, and they found no observable shift in the SF holdings towards investments with a higher ethical rating at the end of the year ([Kempf & Osthoff, 2008](#)) and no manipulation of disclosed ESG image in order to attract more investment flows ([Muñoz et al., 2022](#)).

Recent studies using ESG scores, including [Białkowski and Starks \(2016\)](#), [Joliet and Titova \(2018\)](#), [Nitsche and Schröder \(2018\)](#), and [Alda \(2020\)](#), have shown that the ESG scores of SF are higher than those of their conventional counterparts. [Białkowski and Starks \(2016\)](#) found that US domestic funds had significantly higher positive exposures to ESG categories from MSCI. [Joliet and Titova \(2018\)](#) focused on US equity funds in 2005–2009, while [Nitsche and Schröder \(2018\)](#) studied the top 10 fund holdings of European and Global funds. [Alda \(2020\)](#), on the other hand, tested UK SRI matched pension funds using the nearest-neighbor matching approach.

[Table 1](#) highlights the most relevant research on the topic that has been expanded in the previous paragraphs. Thus, considering the mixed results and controversies, we wish to contribute to the growing debate about the challenges of mainstream SRI by testing the following Hypothesis:

**H1a.** The portfolio of the “self-labeled” SF shows a higher ESG performance than their matched CF.

**H1b.** The portfolio of the “self-labeled” SF shows a lower Sustainability risk than their matched CF.

We test whether self-labeled SF are true to their fiduciary duty. If SF are true to their nature, they will accompany the green talk with substantive portfolio selection. This should be reflected in higher relative ESG scores, which could be called “green highlighting” ([Walker & Wan, 2012](#)). On the other hand, if the hypothesis is not supported, we could argue that the objectives of the self-labeled ESG funds are misleading.

## 2.2. Impact of institutional context

It has been noted in the academic literature that the institutional and geographical context can influence sustainability disclosure and performance. [DiMaggio \(1988\)](#) suggests that organizations are responsive to the expectations and pressures of their institutional environments. Additionally, research has shown that a country’s political context can impact corporate social performance, as

**Table 2**  
Definition of variables.

| VARIABLE              | DEFINITION   |
|-----------------------|--|
| ESG_PERFORMANCE       | Refinitiv Lipper Fund ESG score based on the holdings of the portfolio. The score ranges from 0 (worst) to 100 (best). To qualify the fund must have ESG scores on at least 70% of the holding.  |
| ENVI_PERFORMANCE      | Refinitiv Lipper Fund Environmental score based on the holdings of the portfolio. The score ranges from 0 (worst) to 100 (best). The score is divided into three themes: resource, emissions, and environmental innovation.  |
| SO_PERFORMANCE        | Refinitiv Lipper Fund Social score based on the holdings of the portfolio. The score ranges from 0 (worst) to 100 (best). The score is divided into three themes: workforce, human rights, and community.  |
| CG_PERFORMANCE        | Refinitiv Lipper Fund Governance score based on the holdings of the portfolio. The score ranges from 0 (worst) to 100 (best). The score is divided into three themes: management, Shareholders and CSR strategy.   |
| SUS_RISK              | Morningstar Portfolio Sustainability Score measures the magnitude of the unmanaged ESG risk of the eligible portfolio holdings. The score ranges from 0 (best – negligible risk) to a maximum score of 50 in 95% of the cases. To qualify for a score, at least 67% of the fund’s qualified holdings must be eligible to be rated. |
| ENVI_RISK             | Morningstar Portfolio Environmental Risk Score is the asset-weighted average of the covered corporate holdings’ environmental risk scores (unmanaged environmental exposures). The score ranges from 0 (best) to 100 (worst); though most scores range between 0 and 25.   |
| SO_RISK               | Morningstar Portfolio Social Risk Score is the asset-weighted average of the covered corporate holdings’ social risk scores (unmanaged social exposures). The score ranges from 0 (best) to 100 (worst); though most scores range between 0 and 25.  |
| CG_RISK               | Morningstar Portfolio Governance Risk Score is the asset-weighted average of the covered corporate holdings’ governance risk scores (unmanaged governance exposures). The scores range from 0 (best) to 100 (worst); though most scores range between 0 and 25.  |
| SUS_SELF-LABELED      | A dummy variable that takes the value 1 for those funds whose names include terms such as ESG, SRI, Sustainable, Social, Ethic, green, clean, carbon, net zero, SDG, climate, responsibility, sustainability, or Ethical   |
| EUROPE_AREA           | A dummy variable that takes the value 1 for those funds with a portfolio invested in Europe (including the UK)   |
| ASIA_AREA             | A dummy variable that takes the value 1 for those funds with a portfolio invested in Asia (including Japan)  |
| EMERGING_AREA         | A dummy variable that takes the value 1 for those funds with a portfolio invested in Emerging Markets defined by Morningstar.  |
| GLOBAL_AREA           | A dummy variable that takes the value 1 for those funds refers to funds that invest globally and have no geographical restrictions.  |
| STYLE_GROWTH          | A dummy variable that takes the value 1 for those funds that are classified as Growth Style in terms of investment style.  |
| STYLE_VALUE           | A dummy variable that takes the value 1 for those funds that are classified as Value Style in terms of investment style.   |
| SIZE_MID              | A dummy variable that takes the value 1 for those funds that are classified as Mid-Size in terms of investment size.   |
| BETA                  | Beta estimated for 1 year to last month end  |
| FINANCIAL_PERFORMANCE | Financial Performance of the fund considering the time series for 1 year performance   |
| SIZE                  | Logarithm of total assets under management of the fund   |

demonstrated by Ioannou and Serafeim (2012).

Fund managers have a Fiduciary duty toward investors to follow the investment approach established in the fund mandate. Investors are incentivized through growing societal, regulatory, and industry pressures to act more responsibly (Gibson et al., 2020). Since the launch of PRI in 2009, it has become internationally accepted (Alda, 2020) to include ESG considerations as part of the fiduciary duty. However, acceptance is not yet equal worldwide, reflecting cultural, institutional, and regulatory differences.

Different regions have varying perceptions of sustainability and fiduciary duty. Takahashi and Yamada (2021) note that there are varying levels of commitment to sustainability and corporate social responsibility across different countries and that there are differences in the extent to which investors are aware of this commitment. As pointed out by Amir and Serafeim (2018), investors in the US tend to believe that ESG information is less relevant compared to their European counterparts. Code law countries, like Europe, have shown a greater commitment to Corporate Social Responsibility as part of stakeholder commitment than common law countries like the USA (De Villiers & Marques, 2016).

Europe is widely considered the leading region in terms of the adaptation rate of ESG practices (Kaiser, 2020). This could be linked to the EU's sustainable finance initiatives and regulations. In the wake of the 2015 Paris Climate Agreement, the EU introduced the *Action Plan on Financing Sustainable Growth* (European Commission, 2018) and the *EU Green Deal* (European Commission, 2019). These plans aimed to redirect capital flows toward sustainable investments and promote greater transparency and disclosure in the financial industry. Among these initiatives, the *Sustainability-related disclosure for the financial services* (known as SFDR) is one that directly affected the EU fund industry. SFDR mandates financial market players to disclose sustainability risks and principal adverse impacts (PAI) and classify funds based on sustainability commitment. This regulation has been associated with improved ESG scores for European funds compared to US funds (Becker et al., 2021). Furthermore, in Europe, fund managers have a stronger belief in the positive impact of SRI (van Duuren et al., 2016), and there is a higher demand for ESG investments from European institutional investors (Dyck et al., 2019).

In the Asia Pacific region, there has been a notable increase in interest in Corporate Social Responsibility (CSR) as institutional investors commit to SRI. ESG compliance is in its nascent stage (Umar et al., 2022); however, it is gaining momentum in the region (Fabozzi et al., 2021). ESG compliance is also in its nascent phase in most emerging markets. However, Badía et al. (2020) have pointed out that markets in this area do not believe CSR practices can yield financial benefits, which aligns with a more conventional perspective.

As seen in Table 1, previous research has focused mainly on single regions with a clear focus on the US. However, different institutional backgrounds and countries can affect ESG performance (Ortas et al., 2015). Therefore, we propose testing if the geographical differences mentioned can influence ESG fund score behavior. Is the institutional and regulatory framework explaining differences in ESG fund performance? This study proposes to test the following Hypothesis:

**H2a.** Those funds with a portfolio invested in geographic regions with an institutional and regulatory framework that supports sustainability present higher ESG performance.

**H2b.** Those funds with a portfolio invested in geographic regions with an institutional regulatory framework that supports sustainability present lower sustainability risk.

**Table 3**  
Descriptive statistics.

|                       | Mean  | Standard Deviation | Minimum | First Quartile | Median | Third Quartile | Maximum |
|-----------------------|-------|--------------------|---------|----------------|--------|----------------|---------|
| ESG_PERFORMANCE       | 73.52 | 5.17               | 52.49   | 70.16          | 73.16  | 77.09          | 83.85   |
| ENVI_PERFORMANCE      | 69.51 | 6.74               | 40.01   | 64.53          | 69.48  | 73.67          | 85.13   |
| SO_PERFORMANCE        | 76.12 | 5.42               | 51.33   | 72.89          | 76.10  | 79.64          | 86.57   |
| CG_PERFORMANCE        | 72.15 | 5.09               | 58.82   | 68.91          | 72.76  | 75.90          | 82.47   |
| SUS_RISK              | 20.24 | 1.78               | 15.59   | 18.92          | 20.30  | 21.49          | 24.42   |
| ENVI_RISK             | 4.16  | 0.92               | 2.43    | 3.50           | 4.10   | 4.65           | 7.91    |
| SO_RISK               | 8.38  | 0.79               | 5.43    | 7.93           | 8.39   | 8.92           | 11.19   |
| CG_RISK               | 6.90  | 0.80               | 4.83    | 6.40           | 6.80   | 7.32           | 9.12    |
| SUS_SELF-LABELED      | 0.50  | 0.50               | 0       | 0              | 0.5    | 1              | 1       |
| EUROPE_AREA           | 0.24  | 0.43               | 0       | 0              | 0      | 0              | 1       |
| ASIA_AREA             | 0.07  | 0.25               | 0       | 0              | 0      | 0              | 1       |
| EMERGING_AREA         | 0.10  | 0.30               | 0       | 0              | 0      | 0              | 1       |
| GLOBAL_AREA           | 0.42  | 0.50               | 0       | 0              | 0      | 1              | 1       |
| STYLE_GROWTH          | 0.23  | 0.42               | 0       | 0              | 0      | 0              | 1       |
| STYLE_VALUE           | 0.10  | 0.30               | 0       | 0              | 0      | 0              | 1       |
| SIZE_MID              | 0.05  | 0.22               | 0       | 0              | 0      | 0              | 1       |
| BETA                  | 0.93  | 0.18               | 0.35    | 0.85           | 0.95   | 1.03           | 1.4     |
| FINANCIAL_PERFORMANCE | 8.62  | 7.57               | -13.08  | 2.98           | 8.71   | 14.04          | 29.8    |
| SIZE                  | 16.84 | 3.18               | 6.71    | 15.14          | 16.90  | 18.56          | 24.55   |

The table shows the descriptive statistics. The number of observations is 184.



**Table 4**  
Correlation matrix.

|                      | (1)      | (2)      | (3)      | (4)      | (5)      | (6)      | (7)      | (8)      | (9)   | (10)     | (11)     | (12)     | (13)    | (14)    | (15)  | (16)    | (17)   | (18)  | (19) |
|----------------------|----------|----------|----------|----------|----------|----------|----------|----------|-------|----------|----------|----------|---------|---------|-------|---------|--------|-------|------|
| (1) ESG_PERFORMANCE  |          |          |          |          |          |          |          |          |       |          |          |          |         |         |       |         |        |       |      |
| (2) ENVI_PERFORMANCE | 0.94***  |          |          |          |          |          |          |          |       |          |          |          |         |         |       |         |        |       |      |
| (3) SO_PERFORMANCE   | 0.96***  | 0.88***  |          |          |          |          |          |          |       |          |          |          |         |         |       |         |        |       |      |
| (4) CG_PERFORMANCE   | 0.88***  | 0.73***  | 0.75***  |          |          |          |          |          |       |          |          |          |         |         |       |         |        |       |      |
| (5) SUS_RISK         | -0.44*** | -0.31*** | -0.44*** | -0.50*** |          |          |          |          |       |          |          |          |         |         |       |         |        |       |      |
| (6) ENVI_RISK        | -0.08    | 0.06     | -0.13*   | -0.10    | 0.61***  |          |          |          |       |          |          |          |         |         |       |         |        |       |      |
| (7) SO_RISK          | 0.01     | 0.01     | 0.03     | -0.06    | 0.52***  | 0.20***  |          |          |       |          |          |          |         |         |       |         |        |       |      |
| (8) CG_RISK          | -0.17**  | -0.12    | -0.09    | -0.35*** | 0.54***  | 0.06     | 0.55***  |          |       |          |          |          |         |         |       |         |        |       |      |
| (9) SUS_SELF-LABELED | 0.10     | 0.06     | 0.12     | 0.07     | -0.44*** | -0.38*** | -0.30*** | -0.17**  |       |          |          |          |         |         |       |         |        |       |      |
| (10) EUROPE_AREA     | 0.45***  | 0.46***  | 0.35***  | 0.52***  | -0.31*** | 0.02     | -0.36*** | -0.37*** | 0.00  |          |          |          |         |         |       |         |        |       |      |
| (11) ASIA_AREA       | -0.29*** | -0.20*** | -0.31*** | -0.35*** | 0.27***  | 0.06     | -0.05    | -0.36*** | 0.00  | -0.15**  |          |          |         |         |       |         |        |       |      |
| (12) EMERGING_AREA   | -0.29*** | -0.26*** | -0.20*** | -0.42*** | 0.41***  | 0.12     | 0.06     | 0.56***  | 0.00  | -0.18**  | -0.09    |          |         |         |       |         |        |       |      |
| (13) GLOBAL_AREA     | -0.01    | -0.05    | 0.01     | 0.02     | -0.08    | 0.03     | 0.07     | -0.23*** | 0.00  | -0.48*** | -0.23*** | -0.29*** |         |         |       |         |        |       |      |
| (14) STYLE_GROWTH    | -0.21*** | -0.23*** | -0.14*   | -0.24*** | -0.19*** | -0.24*** | -0.05    | 0.02     | 0.09  | -0.16**  | 0.06     | -0.01    | 0.10    |         |       |         |        |       |      |
| (15) STYLE_VALUE     | 0.16**   | 0.16**   | 0.16**   | 0.13*    | 0.08     | 0.18**   | 0.05     | 0.04     | -0.11 | -0.06    | -0.09    | 0.02     | 0.13*   | -0.18** |       |         |        |       |      |
| (16) SIZE_MID        | -0.20*** | -0.18**  | -0.25*** | -0.07    | 0.02     | 0.18**   | -0.23*** | -0.23*** | -0.08 | -0.01    | -0.06    | 0.01     | 0.11    | 0.05    | 0.01  |         |        |       |      |
| (17) BETA            | -0.03    | -0.04    | -0.04    | 0.01     | 0.07     | -0.00    | -0.04    | 0.11     | -0.03 | 0.16**   | -0.01    | 0.12*    | -0.17** | 0.08    | -0.06 | 0.11    |        |       |      |
| (18) FINANCIAL_PER.  | 0.37***  | 0.36***  | 0.31***  | 0.36***  | -0.22    | -0.11    | 0.09     | -0.09    | -0.07 | 0.12     | -0.26*** | -0.32*** | 0.15**  | -0.05   | 0.02  | -0.17** | 0.16** |       |      |
| (19) SIZE            | 0.11     | 0.11     | 0.07     | 0.15**   | -0.16**  | 0.01     | -0.06    | -0.08    | -0.08 | 0.15**   | -0.07    | -0.07    | -0.05   | 0.12*   | 0.03  | 0.05    | -0.07  | -0.00 |      |

The table shows the Pearson's pair-wise correlation matrix. Statistically significant at 1% (\*\*\*), 5% (\*\*) and 10% (\*).

### 3. Data and methodology

#### 3.1. Data collection

We perform an analysis focused on equity funds that are self-labeled as sustainable. We focus on active Equity funds, as they represent the most prominent worldwide category (Gangi et al., 2020). Using the fund management tools on the Morningstar website in August 2023, we searched for funds within the whole fund market of each country that are specifically advertised as sustainable. As there is no specific data point from any database that includes this information, we have used as a proxy for “Sustainable self-labeled” those funds whose names include terms such as ESG, SRI, Sustainable, Social, Ethic, green, clean, carbon, net zero, SDG, climate, responsibility, sustainability, or Ethical (similar to the approach used by Takahashi & Yamada, 2021). In our sample, the Sustainable label was used in 72% of pairs, while ESG was used in 18%. We argue in line with Joliet and Titova (2018) that the funds included have, therefore, voluntarily proven their willingness to include ESG considerations.

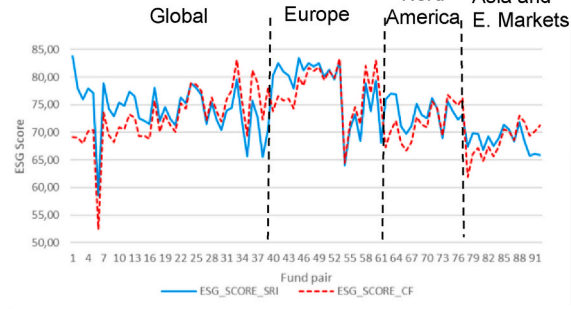
We focus on active equity funds and use a matching approach similar to Belghitar et al. (2017), which showed that the Fund Management Company played a major role in the matching. We use a one vs. one approach and five matching criteria: same management Fund company, geographical area of investment, investment size, and style according to the 9-grid box from Morningstar (Madhavan et al. (2021) and Ramos et al. (2023) found that investment size and style explain ESG scores, particularly for environmental scores.), and we finish with the traditional factors observed to impact fund performance, which are Age of the fund and Size (Nanda et al., 2009; Ruenzi, 2005).

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

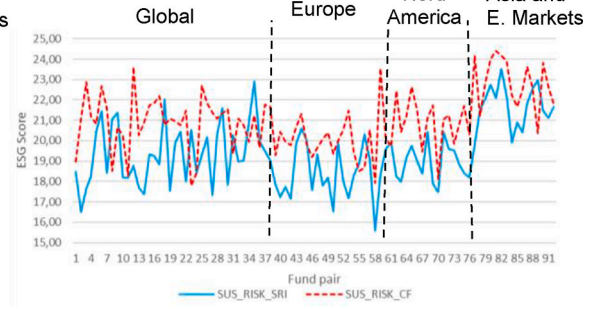
Our sample is affected due to the two most restrictive criteria: same management company and investment style. First, we define the whole universe funds from those funds with complete financial disclosed/available data (see control variables in section 3.2) in the Morningstar database. From the whole universe screened, we obtained 92 matched pairs of funds with 194 observations. We obtained the last published ESG performance score from the first semester of 2023 in Refinitiv and the last published Sustainability ESG risk measure from Morningstar.

As a partial robustness check, we have added another sample period that includes 139 matched pairs at four different periods, ranging from the second quarter of 2022 to the second quarter of 2023, and we have obtained a total of 924 observations. Due to variable constraints, this panel sample was created only with available data from Refinitiv and, therefore, was only focused on ESG performance scores. Note that this sample does not include sustainability risks data and financial control variables since we could not access the historical information from Morningstar. In this case, the study uses panel data methodology with the aim of addressing the

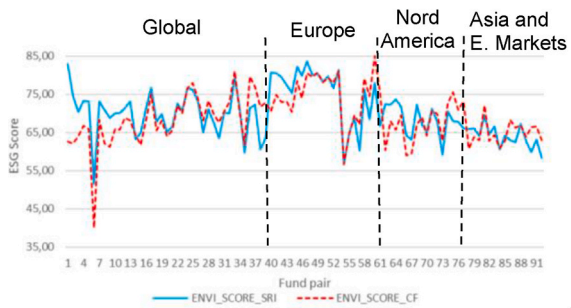
**1a. ESG performance**



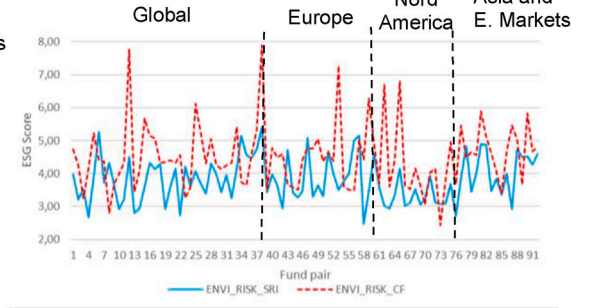
**1b. Sustainability risk**



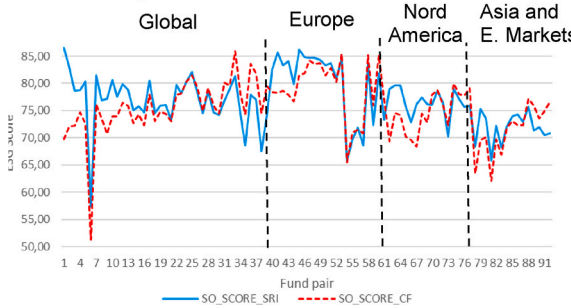
**1c. Environmental performance**



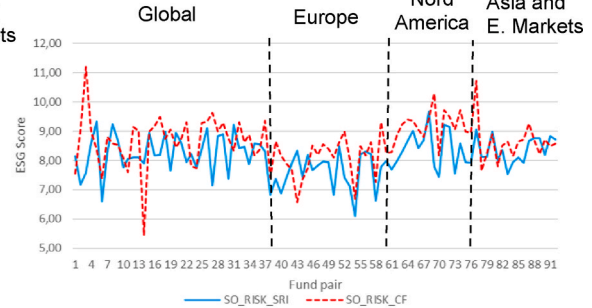
**1d. Environmental risk**



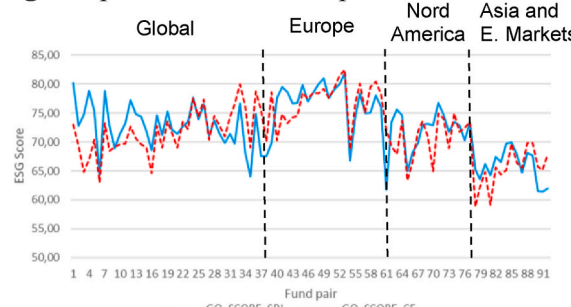
**1e. Social performance**



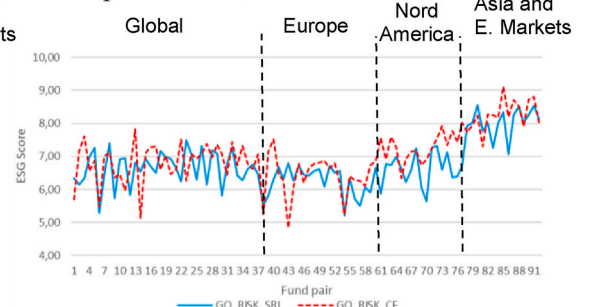
**1f. Social risk**



**1g. Corporate Governance performance**



**1h. Corporate Governance risk**



(caption on next page)



**Fig. 1.** Comparison of performance and risk by each pair of funds: SF vs CF

Legend: — SF ESG score - - - - CF ESG score

This Figure shows the different ESG scores by matched funds (SF vs CF) classified by geographic area of investment. Note that each graph is based on a concrete ESG score.

existence of latent unobservable effects specific to each fund. In particular, this study has applied the generalized least square (GLS) random effect (RE) technique. This study does not consider the fixed effects (FE) technique because the model includes dummy variables, and it can not be estimated under this technique since the estimator uses the variation within data (Pulido Pavón, 2015). Results are included in the Annex.

3.2. Methodology - linear regression model

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

$$ESG_i = \beta_0 + \beta_1 \bullet Sus\ self - Labeled_i + \beta_2 \bullet Europe\ Area_i + \beta_3 \bullet Asia\ Area_i + \beta_4 \bullet Emerging\ Area_i + \beta_5 \bullet Global\ Area_i + \beta_6 \bullet Growth\ Style_i + \beta_7 \bullet Value\ Style_i + \beta_8 \bullet Mid\ Size_i + \beta_9 \bullet Beta_i + \beta_{10} \bullet financial\ performance_i + \beta_{11} \bullet Size_i + \epsilon_i \tag{Eq. 1}$$

The variables included in Equation (1), which are defined in Table 2, are consistent with previous research (Alda, 2020; Gangi & Varrone, 2018). The dependent variable of this study is the ESG score from the most accepted ESG providers of information (ESG performance Refinitiv and sustainability risk from Morningstar).

We rely on Refinitiv fund ESG scores (used by Gangi & Varrone, 2018; Nitsche & Schröder, 2018) to assess ESG performance, where a higher score indicates better performance. The eligibility criterion is a minimum of 10 securities in the portfolio and ESG performance scores for 70% of the holdings of the portfolio. The scoring is based on relative benchmarks, a materiality matrix, and transparency weighting. The ESG score is broken down into three pillars and is complemented by an ESG Controversy Score, which measures the impact of negative controversy scores. On the other hand, Morningstar’s Portfolio Sustainability score (used by Alda, 2020; Joliet & Titova, 2018; S. Kim & Yoon, 2020; Nitsche & Schröder, 2018) is designed to assess unmanaged risk, with a lower score indicating less risk. This means that a lower score is preferable. The score uses Sustainalytics data, and the eligibility criterion is that at least 67% of the fund’s qualified holdings must have an ESG score.

As explained in the previous section, the independent variable is ‘Sustainability - self-labeled’, which is a dummy variable that takes the value one if the fund is considered sustainable in terms of the fund name. In order to measure the different institutional contexts by geographic area of investment of the fund, this study used the following dummy variables: Europe (including the UK), Asia (including

**Table 5**  
ESG Performance and Sustainability Risk of SFs and CFs from a multi-regional perspective.

|               | GLOBAL   | EUROPE   | NORD AMERICA | ASIA&EMER. MARKETS | TOTAL    |
|---------------|----------|----------|--------------|--------------------|----------|
| ESG PER. SF   | 74.13    | 77.92    | 73.57        | 68.65              | 74.03    |
| ESG PER. CF   | 72.75    | 77.38    | 71.93        | 68.64              | 73.00    |
| (% SF > CF)   | (61.54%) | (59.09%) | (62.50%)     | (60.00%)           | (59.78%) |
| ENVI PER. SF  | 69.88    | 75.27    | 68.28        | 63.49              | 69.92    |
| ENVI SCORE CF | 68.27    | 74.74    | 67.39        | 64.28              | 69.10    |
| (% SF > CF)   | (58.97%) | (63.64%) | (56.25%)     | (46.67%)           | (56.52%) |
| SO PER. SF    | 76.92    | 79.97    | 76.61        | 72.22              | 76.76    |
| SO SCORE CF   | 75.49    | 78.94    | 74.59        | 71.96              | 75.48    |
| (% SF > CF)   | (61.54%) | (72.73%) | (56.25%)     | (66.67%)           | (63.04%) |
| GO PER. SF    | 72.66    | 76.79    | 72.44        | 65.87              | 72.48    |
| GO SCORE CF   | 71.87    | 76.88    | 70.79        | 65.81              | 71.82    |
| (% SF > CF)   | (58.97%) | (50.00%) | (68.75%)     | (60.00%)           | (57.61%) |
| SUS RISK SF   | 19.31    | 18.50    | 18.95        | 21.78              | 19.46    |
| SUS RISK CF   | 20.85    | 20.05    | 21.12        | 22.67              | 21.02    |
| (% SF > CF)   | (74.36%) | (86.36%) | (100%)       | (86.67%)           | (82.61%) |
| ENVI RISK SF  | 3.85     | 3.86     | 3.31         | 4.10               | 3.81     |
| ENVI RISK CF  | 4.54     | 4.51     | 4.25         | 4.65               | 4.51     |
| (% SF > CF)   | (82.05%) | (72.73%) | (87.50%)     | (86.67%)           | (80.43%) |
| SO RISK SF    | 8.21     | 7.65     | 8.46         | 8.36               | 8.14     |
| SO RISK CF    | 8.66     | 8.09     | 9.33         | 8.53               | 8.61     |
| (% SF > CF)   | (66.67%) | (81.82%) | (93.75%)     | (53.33%)           | (71.74%) |
| GO RISK SF    | 6.60     | 6.28     | 6.66         | 8.06               | 6.77     |
| GO RISK CF    | 6.79     | 6.46     | 7.27         | 8.33               | 7.03     |
| (% SF > CF)   | (58.97%) | (72.73%) | (81.25%)     | (53.33%)           | (64.13%) |

This table shows the average of ESG score and how many SFs perform better than CFs in relative terms in brackets.

Japan), Emerging Markets (defined by Morningstar), and Global Market (refers to funds that invest globally and have no geographical restrictions). The North America (USA and Canada) area is the dummy variable omitted. The study includes as control variables: investment style (Growth Style and Value Style are included; Blend Style is the dummy variable omitted), investment size (Mid-Size is included, Large Size is the dummy variable omitted), Beta for 1 year to last month end, Financial Performance (1-year performance) and Fund Size measured as logarithm of total assets under management of the fund.

#### 4. Results

Table 3 displays the descriptive statistics of the variables included in the empirical analysis. The funds' average is 73.52 for the ESG performance and 20.24 for the sustainability risk. In average terms, the dimension that presents the most favorable score in performance terms is the social one, and the most unfavorable is the environmental one. However, in terms of risk, the environmental risk is more favorable than the social one. Corporate governance is the dimension that shows less variability during the sample period. Regarding the geographic area of investment of the funds, Table 3 shows that 24% of funds were invested in Europe, 17% in North America (in particular, USA), 7% in Asia, 10% in Emerging Markets, and 42% in global markets. Table 4 contains Pearson's pair-wise correlation matrix for the variables used in this study. The three dimensions of sustainability in terms of performance showed statistically significant correlations for those funds that invested in Europe, Asia or Emerging areas. Furthermore, this table also displays the statistically significant relationships between risk variables and the "self-declared" sustainable funds variable.

Fig. 1 shows the ESG scores by matched funds (SF vs CF) classified by geographic area of investment. In addition, Table 5 displays the average ESG score (both performance and risk) by geographic area and the number of cases where SF outperform CF. On the one hand, it is observed that, on average, those funds that invest in EU companies present a more favorable ESG score (except for environmental risk), and those that invest in Asia and Emerging Markets have a more unfavorable ESG score (except for social risk). Although, it is also noticed that, in the case of Europe, the differences in the ESG performance between SF and CF are less substantial than in other geographic areas.

On the other hand, in most cases, the ESG performance (ESG risk) from the SF fund is higher (lower) than the CF, as is expected in Hypothesis 1a and 1 b. Focusing on sustainability dimensions, the differences between SF funds and CF funds are less evident in the corporate governance dimension, which could be explained because the corporate governance practices are reasonably regulated worldwide in the case of the listed companies due to best practices internationally recognized combined with the regulatory aftermath of the global financial crisis (Gibson et al., 2020). Regarding the environmental dimension, it's surprising and counter-intuitive to find that only 46.7% of the SF perform better than CF in Asia and Emerging Markets.

Tables 6 and 7 present the results of the regression analysis. Focusing on hypotheses 1a and 1 b, the results find evidence to support them and reveal SUS\_SELF-LABELED as a significant variable that affects positively (negatively) the ESG performance (sustainability risk). This relationship is also reflected in the results of the Social and Corporate Governance dimensions and Environmental (however, in this last case, at a 10% significance level).

Regarding hypotheses 2a and 2 b, the results support them with respect to the overall sustainability variables, that is, ESG performance and sustainability risk. The results show that funds invested in the European region have a positive impact on ESG performance and lower sustainability than those funds invested in the North American region. Also aligned with the hypotheses, the study finds evidence that those funds invested in Asia and the Emerging Markets exhibit a worse ESG performance and higher sustainability risk than those invested in the North American and European regions.

**Table 6**  
Regression results – ESG performance.

| Explanatory variables | ESG PERFORMANCE     | ENVIRONMENTAL PERFORMANCE | SOCIAL PERFORMANCE  | CORPORATE GOVERNANCE PERFORMANCE |
|-----------------------|---------------------|---------------------------|---------------------|----------------------------------|
| SUS_SELF-LABELED      | 1.3459** (0.6085)   | 1.3533* (0.8189)          | 1.4524** (0.6983)   | 1.0548** (0.5102)                |
| EUROPE AREA           | 4.8781*** (0.8444)  | 7.1200*** (1.1607)        | 4.0475*** (0.9685)  | 4.8461*** (0.8320)               |
| ASIA AREA             | -3.3701** (1.3932)  | -0.7908 (1.0107)          | -4.6762** (1.9585)  | -5.0164*** (1.5946)              |
| EMERGING AREA         | -2.4265** (0.9750)  | -1.2723 (1.2385)          | -1.5712 (1.0915)    | -5.2461*** (1.0725)              |
| GLOBAL AREA           | 0.8421 (0.6986)     | 1.3475 (1.0444)           | 0.8573 (0.7708)     | 0.7024 (0.6842)                  |
| STYLE GROWTH          | -1.3353** (0.6414)  | -2.1158** (0.8476)        | -0.6073 (0.7083)    | -1.8999*** (0.7067)              |
| STYLE VALUE           | 2.5263*** (0.9460)  | 3.3862** (1.3650)         | 2.7491*** (0.9371)  | 1.7359** (0.8379)                |
| SIZE MID              | -3.8570* (2.0087)   | -3.9476 (2.6244)          | -5.7841** (2.4135)  | -1.2101 (1.3439)                 |
| BETA                  | -1.4936 (1.8851)    | -3.2724 (2.1787)          | -1.2716 (2.3543)    | 0.2953 (1.8682)                  |
| FINANCIAL PERFORMANCE | 0.1377** (0.0578)   | 0.2279*** (0.0612)        | 0.1072 (0.0721)     | 0.0875 (0.0606)                  |
| SIZE                  | 0.0899 (0.0957)     | 0.1228 (0.1233)           | 0.0520 (0.1119)     | 0.1384 (0.0847)                  |
| CONSTANT              | 70.7125*** (2.4821) | 66.0909*** (3.2506)       | 74.0549*** (2.9577) | 67.9840*** (2.3669)              |
| R <sup>2</sup>        | 0.4417              | 0.4087                    | 0.3515              | 0.5480                           |
| F- statistic          | 16.62***            | 19.21***                  | 9.64***             | 27.49***                         |
| N. obs.               | 184                 | 184                       | 184                 | 184                              |
| VIF max. (mean)       | 2.04 (1.37)         |                           |                     |                                  |

The table shows the results of the estimation of ESG performance.

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

**Table 7**  
Regression results – Sustainability Risk.

| Explanatory variables | SUSTAINABILITY RISK | ENVIRONMENTAL RISK  | SOCIAL RISK          | CORPORATE GOVERNANCE RISK |
|-----------------------|---------------------|---------------------|----------------------|---------------------------|
| SUS_SELF-LABELED      | −1.5363*** (0.1842) | −0.6393*** (0.1185) | −0.4859*** (0.0973)  | −0.2514*** (0.0706)       |
| EUROPE AREA           | −0.8650*** (0.2656) | 0.3182 (0.1982)     | −1.0097*** (0.1563)  | −0.5843*** (0.1081)       |
| ASIA AREA             | 1.8991*** (0.4864)  | 0.5847* (0.3397)    | −0.6284*** (0.2024)  | 1.1907*** (0.2203)        |
| EMERGING AREA         | 2.1618*** (0.3497)  | 0.5781** (0.2557)   | −0.3115 (0.1910)     | 1.4780*** (0.1439)        |
| GLOBAL AREA           | 0.0806 (0.2512)     | 0.3613** (0.1652)   | −0.3845***<br>0.1416 | −0.2197** (0.0960)        |
| STYLE GROWTH          | −0.8344*** (0.2381) | −0.4533*** (0.1398) | −0.1243 (0.1341)     | 0.0048 (0.0897)           |
| STYLE VALUE           | 0.0480 (0.3383)     | 0.3188 (0.2541)     | −0.0202 (0.2131)     | 0.1285 (0.1216)           |
| SIZE MID              | −0.1025 (0.4571)    | 0.5829 (0.4194)     | −0.8760** (0.4041)   | −0.7029*** (0.2495)       |
| BETA                  | 0.6652 (0.6012)     | −0.0213 (0.4061)    | 0.1410 (0.3772)      | 0.2613 (0.2820)           |
| FINANCIAL PERFORMANCE | −0.0175 (0.0158)    | −0.0085 (0.0117)    | 0.0031 (0.0084)      | 0.0189*** (0.0072)        |
| SIZE                  | −0.0511* (0.0290)   | 0.0021 (0.0148)     | −0.0039 (0.0153)     | 0.0048 (0.0118)           |
| CONSTANT              | 21.4392*** (0.8341) | 4.2602** (0.4687)   | 9.0753*** (0.4538)   | 6.5720*** (0.3213)        |
| R <sup>2</sup>        | 0.5473              | 0.2742              | 0.3360               | 0.6517                    |
| F- statistic          | 22.10***            | 6.02***             | 7.45***              | 36.65***                  |
| N. obs.               | 184                 | 184                 | 184                  | 184                       |
| VIF max. (mean)       | 2.04 (1.37)         |                     |                      |                           |

The table shows the results of the estimation of sustainability risk.

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

Focusing on the different sustainability dimensions, the results can be extrapolated in the case of corporate governance. These results are consistent with [Dyck et al. \(2019\)](#), who state that Europe has been seen as a region pushing firms to higher environmental and social performance levels. These findings are also consistent with [Nitsche & Schröder's \(2018\)](#) results that showed that European companies had, on average, higher ESG scores than the US and the Asia Pacific ones and that European funds were, on average, more sustainable than global funds.

However, the results for the environmental and social dimensions are not as conclusive. Funds investing in Europe show better social and environmental performance and less exposure to unmanaged social risks. In the case of environmental risks, no statistical evidence is found. This could be due to the fact that environmental aspects have become more pervasive in both regulations. Regarding Asia and the Emerging Market regions, the econometric analysis does not provide conclusive evidence about the environmental and social dimensions.

In terms of performance, we only observe statistical significance in the portfolios invested in the Asia region and their impact on social performance, which is aligned with hypothesis 2a, an underperformance compared to the North American market benchmark.

If we refer to the area of unmanaged risks, the portfolios invested in Asian or Emerging Markets support hypothesis 2 b when we focus on environmental risks. This is not the case for social risks, where the results, in the case of the Asian market, are counter-intuitive. The explanations for this result may be complex. The information universe of the two information providers, Refinitiv and Morningstar, are not comparable. Refinitiv focuses on the performance of best practices on the workforce, human rights, and contribution to the community, whereas Morningstar focuses on the exposure to unmanaged social risks from the company's point of view.

As a partial robustness check, we have added another sample period that includes 139 matched pairs at four different periods, ranging from the second quarter of 2022 to the second quarter of 2023, and we have obtained a total of 924 observations. Due to variable constraints, this panel sample was created only with available data from Refinitiv and, therefore, was only focused on ESG performance scores. Note that this sample does not include sustainability risks data and financial control variables since we could not access to the historical information from Morningstar. Results are included in the Annex.

As a partial robustness check, we have repeated the analysis in the case of ESG performance, extending the sample to 132 pairs of funds in four different periods. The annex shows the results. The results find clear evidence to support the hypotheses related to ESG performance, e.i. Hypothesis 1a and 2a do not reject the validity of the previous empirical part.

## 5. Discussion

Our research indicates that self-labeled SF is a significant variable behind ESG score performance. Our findings are consistent with those of [Nitsche and Schröder \(2018\)](#) and [Alda \(2020\)](#), who observed that the ESG scores of SF are higher than those of their conventional counterparts. As [Ioannou & Serafeim \(2014\)](#) pointed out, these labels can become a signaling tool for the commitment of sustainable funds to transparency.

The observed geographical differences in our results may be driven by variations in the perception of fiduciary duty and regulation and the quality of ESG information, as detailed in the following paragraphs.

### 5.1. ESG and fiduciary duty

As mentioned previously, the link between ESG and fiduciary duty shows regional differences that affect the institutional context

and could explain the differences seen in the results from the different regions. A larger percentage of US investors than Europeans believe ESG information is irrelevant for investment purposes (Amir & Serafeim, 2018). For example, in the USA, fiduciary duty was understood as maximizing the beneficiaries' return. Gibson et al. (2020) linked the worst ESG performance of US institutions to a different interpretation and changing guidelines from the Department of Labor around fiduciary duty in the US market.

Our findings regarding the Asia region aligned with Badia (2020), who observed that firms in this region underperform compared to their European and US counterparts. Eccles et al. (2017) surveyed 582 institutional investors and observed that the EMEA region showed the most supportive regulatory environment in ESG, while a higher percentage of respondents in the Asia Pacific Region agreed that there was a lack of standardized regulation in ESG integration. The evolution of some capital markets, for example, China, which is less developed, may be influencing the inclusion of ESG considerations in their fiduciary duty (Eccles et al., 2017).

From this study, we observe that a more coordinated regulation could support a stronger and global sustainability commitment. A more explicit inclusion of ESG considerations in Fiduciary duty could become a definite driver for the sector. An international stewardship and fiduciary code could help to standardize and promote further adaptation of sustainability considerations.

### 5.2. A mandatory and standardized ESG regulation in the field could be key

The previously mentioned lack of a standard definition is one of the critical issues to be addressed to establish more robust grounds and transparency for the sector. The EU announced in March 2018 a plan for Sustainable Finance with the creation of taxonomy or a unified classification system for all players in the financial sector. The purpose is to define "green" to limit room for interpretation and suggest a "threshold" of quality of information to be considered acceptable with the specific objective of eliminating "greenwashing". Regarding funds, the Sustainable Finance Disclosure Regulation (SFDR) requires mandatory disclosures on sustainability risks, adverse sustainability impacts, and fund categorization.

The EU is aware that the absence of harmonized rules causes significant distortions in competition (Muñoz et al., 2021), as different disclosure standards could confuse investors. Therefore, the move of the EU towards mandatory regulation could be behind the observed results. Mandatory ESG disclosure has led to a higher prevalence of sustainable investing (Aghamolla & An, 2021). It has been linked to increased forecast accuracy and reduced dispersion among analysts (Krueger et al., 2021). At the same time voluntary disclosure has been associated with 'cherry-picking' and fabricating positive information (Monciardini et al., 2020; Ferrero-Ferrero, León, & Muñoz-Torres, 2021) and incomplete and not comparable information (Muserra et al., 2020). A refinement of regulation could decrease greenwashing (Gatti et al., 2019; Seele & Gatti, 2017).

Furthermore, as seen in our descriptive statistics, the differences in ESG performance among European funds (SF vs. CF) are the smallest, which could point to a convergence in the European fund market when it comes to ESG performance. This could be attributed to the increasing mandatory disclosure included in the SFDR and the upcoming Corporate Sustainability Reporting Directive (CSRD). Admati & Pfleiderer, 2000, observed that mandatory ESG disclosure led to a greater prevalence of sustainable investing, producing a positive spillover effect. Our findings could be linked to the positive ESG spillover effect between sibling funds, as observed by Li et al. (2022). On the other hand, some practitioners and experts have raised concerns about the SFDR and the convergence of SF and CF, linked to the lack of clarity and fuzziness between the different categories of SFDR (Cremasco & Boni, 2022). This may have resulted in some funds overstating their sustainability commitments, while others may be understating their sustainability commitments depending on the level of greenness they want to convey or signal to the market (Emiris et al., 2023).

The period selected for our sample (2022–2023) could explain the difference between other papers mentioned in the literature review. Gangi and Varrone (2018) study goes from 2009 to 2014, and Kim and Yoon (2020) from 2006 to 2018. In recent years, we have seen supranational agreements supporting Sustainability, such as the Paris Treaty, the United Nations Sustainable Development Goals in 2015, and the EU regulation mentioned above that have become milestones. A voluntary CSR approach could have facilitated greenwashing, leaving room for grey areas (Gatti et al., 2019), so the move towards common standards, stronger scrutiny (Marquis et al., 2016), and third-party verification could prevent greenwashing concerns as has been observed for audited ESG reports of firms that present a higher assurance of quality (del Giudice & Rigamonti, 2020). As S. Kim and Yoon (2020) mentioned, asset managers must provide clearer information and communication on how they are incorporating ESG.

### 5.3. The impact of ESG data and scores

Our findings indicate that portfolios self-labeled as SF exhibit a better performance than CF using different ESG score approaches. However, we assume that ESG scores measure portfolios' ESG performance correctly. Recent academic papers have dwelled on the divergence of ESG ratings (Berg et al., 2019), their actual predictive and signaling value (Yang, 2020), and their variability in time (Berg et al., 2020). Our findings are consistent for both approaches when studying the whole sample. However, we observed a divergence between both when analyzing the different regions. This could be linked to the different approaches used while Refinitiv focuses on the ESG performance of each pillar, and Sustainability measures the unmanaged risks.

ESG ratings have been historically considered subjective, primarily due to the influence of the agency's origins in its conception of sustainability and definition of materiality (Eccles & Strohle, 2018). This subjectivity poses a lower risk of litigation for companies that engage in greenwashing. This could result in a model where rating agencies may not invest enough in detecting greenwashing and end up helping corporates to window dress their ESG performance (Yang, 2020). However, introducing mandatory ESG reporting could provide more independence to ESG assessments and make them less dependent on the firm's size or track record (Sebastian Utz, 2019). There is a need for more certainty and reliability, moving away from controversial scoring methodologies (Jámbor & Zanócz, 2023). Therefore, we welcome the new EU initiative "ESG rating activities: Commission proposal for a Regulation on their

transparency and integrity.” announced on July 2023.

## 6. Conclusions

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

Our paper supports the call from Gatti et al. (2019) to regulators in the EU and other regions to support a reduction of greenwashing activities through increased regulation. A strong legal framework can help investors solve conflicts linked to information asymmetries (Bilbao-Terol et al., 2017), which, combined with higher scrutiny and enforcement, may become a driver to enforce that sustainable funds truly act as sustainable funds. Further research could test the impact of SF on the recent key regulations in the EU mentioned above (SFDR specifically). The concept of true identity could be tested from the point of view of indices analyzing ESG scores of sustainability indexes vs. conventional.

Limitations to our findings could be, as mentioned by previous literature, that ESG scores are static (Gangi & Varrone, 2018), while it could be hard to capture the current quick evolution the sector is experiencing and the fact that SF is a quite heterogeneous market. The ESG data information and instruments need to become more efficient. One of the key drivers of market efficiency is price transparency, available information for all actors, and active and numerous participants. As pointed out by Dorfleitner et al. (2021), in relation to green bonds, reducing the information asymmetry is crucial and will give investors more confidence and lower the risk of greenwashing. Some research has argued that mainstream could have harmed the sector (Revelli, 2017); however, the perception could change if the growth is supported by global regulation and increased transparency.

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## Declaration of competing interest

None.

## ANNEX.

**Table A**

Regression results – ESG performance

| Explanatory variables  | ESG PERFORMANCE     | ENVIRONMENTAL PERFORMANCE | SOCIAL PERFORMANCE   | CORPORATE GOVERNANCE PERFORMANCE |
|------------------------|---------------------|---------------------------|----------------------|----------------------------------|
| SUS_SELF-LABELED       | 1.5219*** (0.5678)  | 1.6445** (0.7024)         | 1.6061** (0.6335)    | 1.2180** (0.5130)                |
| EUROPE AREA            | 4.6260*** (0.8280)  | 6.1574*** (0.9701)        | 3.9905*** (0.9072)   | 4.4983*** (0.7705)               |
| ASIA AREA              | -7.3343*** (1.3147) | -5.0194*** (1.6104)       | -8.8421*** (1.4617)  | -8.3378*** (1.1954)              |
| EMERGING AREA          | -6.1867*** (1.1010) | -7.0553*** (1.3464)       | -5.5686*** (1.2235)  | -7.2827*** (1.0014)              |
| GLOBAL AREA            | -0.6489 (0.8077)    | -0.7799 (0.9792)          | -0.6155 (0.8949)     | -0.7963 (0.7382)                 |
| STYLE GROWTH           | -0.8818 (0.6907)    | -1.4540* (0.8424)         | -0.1805 (0.7672)     | -1.6186*** (0.6284)              |
| STYLE VALUE            | 3.5625*** (0.9805)  | 5.3126*** (1.2142)        | 3.9831*** (1.0946)   | 1.8873** (0.8849)                |
| SIZE MID               | -6.2438*** (1.8083) | -7.3343*** (2.2404)       | -8.5040*** (2.0189)  | -1.9251 (1.6314)                 |
| CONSTANT               | 72.8833*** (0.7630) | 68.4819*** (0.9196)       | 75.51575*** (0.8437) | 72.0160*** (0.6998)              |
| R <sup>2</sup> overall | 0.4083              | 0.4090                    | 0.3439               | 0.4631                           |
| Wald Chi <sup>2</sup>  | 202.50***           | 187.76***                 | 161.40***            | 261.44***                        |
| N. obs.                | 924                 | 924                       | 924                  | 924                              |

The table shows the results of the estimation from the panel data analysis.

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



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