Sustainable Success

A study on the impact of sustainable signals on European equity fund performance

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Table of contents

Abstract

This paper studies the relationship between sustainable signals and the performance of equity funds in Europe. The research question addressed in this paper is which sustainable signals have the most impact on equity fund performance in Europe. The MSCI ESG score and MSCI Impact score are examined as sustainable scores, and the German FNG label and French ISR label are analysed as sustainable labels. A quantitative research is conducted using regression analyses. The results show that the MSCI ESG score has the most impact on the performance of equity funds in Europe when a fund is not labelled with a sustainable label. The findings suggest that sustainable labels are not reliable informational cues for investors to persuade them to shift from unsustainable to sustainable investments.

1. Introduction

This thesis explores the impact of sustainable signals on the performance of funds within the context of the evolving landscape of sustainable investing. In recent years, sustainability has emerged as a crucial theme in the investment sector, reflecting a shift in investor priorities. The strong growth in sustainability-focused investing is accompanied by a broad range of new products and services in this area (PwC, 2020). This proliferation of ESG ratings, sustainability labels, and taxonomies makes it increasingly difficult for investors to select the information needed to make informed investment decisions.

There is a lot of scientific research on climate change mitigation and adaptation, which states that to reach the objectives set by the Paris Agreement under the United Nations Framework Convention on Climate Change (UNFCCC) and the broader Sustainable Development Goals (SDGs), we need to shift from unsustainable to sustainable investment projects (Brauch et al., 2019). To facilitate this transformative shift in global investments, extensive data needs to be gathered in the field of sustainability assessments for specific investments, whether at the company level or project level. Before investors can evaluate the potential to make their investments more sustainable, they must acquire accurate and comprehensive sustainability information, including assessments of involvement in non-sustainable sectors (such as weapons, nuclear energy, coal mining, etc.), human rights performance, and indications of potential corruption within company management.

Since the turn of the century, several tools have emerged to address the challenge of providing clear sustainability information for investors, with significant advancements notably in recent years. The two most important categories are ESG/Impact ratings and sustainability labels. While they provide useful tools for sustainability, they are by no means as complete or reliable as the financial data available to investors.

This research paper will build on the existing academic literature and will further investigate the relation between the performance of equity funds in Europe and sustainability signals as ESG and Impact scores in combination with sustainability labels. We will focus on the following research question: *Which sustainable signals have the most impact on equity funds performance in Europe?* To answer this research question, two sub questions are formulated:

1. What is the relation between the sustainable score and a fund's performance?
2. Is this relationship moderated if the fund is labelled by the FNG and/or ISR?

This research question builds on the paper of Ramos et al. (2022) in which the impact of sustainable signals and their impact on mutual funds is suggested as valuable follow-up research. Answering this main question may help alleviate some of the concerns about whether sustainable labels fulfil their

purpose of acting as credible informational cues suggested in the paper of Ramos et al. (2022). Addressing this central question could persuade investors to attribute greater value to sustainable fund labels, thereby advancing progress towards achieving the climate objectives outlined in the Paris Agreement and the Sustainable Development Goals (SDGs).

This paper will investigate two sustainable scores and two sustainability labels: the MSCI ESG score, the MSCI Impact score, the German FNG label, and the French ISR label, as applied to European equity funds. These funds will be analysed for the effects of these sustainable signals on their financial performance.

Academic research has already been conducted into sustainability labels and ratings of mutual funds. In the paper by Ramos et al. (2022) they examine the coherence of the signals by sustainable labels and certifications sponsored by governmental or non-profit organizations versus private sector organizations and they found divergence between labels of these two categories, with governmental-labelled funds being perceived as bearing high ESG risks by the private sector. Besides addressing information asymmetries, they determine that these sustainable labels act as mechanisms for reducing investors' search costs and increasing transparency in the market. The results of this research show divergent signals from several sustainability labels and certifications, raising concerns about whether these labels fulfil their purpose as credible informational cues and encourage investment in sustainable financial products.

In the paper of Ammann et al. (2018) research is conducted into the effects of the introduction of Morningstar's Sustainability Rating on mutual fund flows. This is Morning Star's ESG rating for equity funds, among others. They find strong evidence that retail investors shift money away from low-rated and into high-rated funds, and Institutional investors react much more weakly to this same publication. Hartzmark and Sussman (2017) performed a natural experiment examining ranking and fund flows and they have found results that are in line with the findings of the paper of Ammann. Their paper suggests that sustainability is viewed as positively predicting future performance, but they do not find evidence that high-sustainability funds outperform low-sustainability funds. Their evidence is consistent with positive affect influencing expectations of sustainable fund performance and nonpecuniary motives influencing investment decisions.

The paper is structured as follows: after the introduction, the theoretical framework will be presented, including a detailed overview of the topic and existing literature in this field. This framework will conclude with the hypothesis statement. The methodology section outlines the study design, data collection and sample, operationalization, data analysis, and model specification. Subsequently, the results of the analyses, the discussion, and the conclusions drawn from these research findings will be presented.

2. Theoretical Framework

2.1. Sustainable Signals

With the strong growth of the sustainability theme in the financial sector, it is increasingly important for investors to be aware of available sustainability information about their investments. Several key information sources in the field of sustainability allow investors to signal to the market whether a fund has a dedicated responsible investment strategy, known as ‘sustainable signals’. Two of the major sustainable signals are sustainable labels and sustainable ratings. Both signals aim to provide investors with information about an equity fund in the field of sustainability. Nevertheless, there are a number of important differences between the two signals.

2.1.1. Sustainable Ratings in Europe

Sustainable ratings are assessments given to funds based on their adherence to ESG criteria. Unlike labels, which are often acquired through an application process by the fund manager, ratings are typically assigned by independent agencies. These ratings provide investors with insights into the sustainability performance of a fund's underlying assets, making it easier to compare funds based on their ESG performance.

Sustainable ratings assess various aspects of a fund, including environmental impact, social responsibility, and governance practices. The criteria used for these assessments include factors such as carbon footprint, labour practices, board diversity, and more. Ratings are generally expressed in a quantitative format, allowing for easy comparison between different funds.

Over the past decade, a wide variety of sustainability scores have emerged. Some scores provide an overall indication of a fund's performance based on a broad bundle of ESG criteria, while others focus on specific sustainability topics, such as biodiversity, impact, or particular Sustainable Development Goals (SDGs). In this study the ESG score and Impact score of MSCI are investigated. The choice of these two specific scores is due to data availability and the fact that the MSCI ESG score is a more general sustainability score, whereas the Impact score is more specific and niche.

MSCI Inc. is an American finance company and leading provider of finance products, including indices, portfolio analysis tools, and ESG ratings. These ratings are designed to provide transparency and understanding of the sustainable characteristics of fund components.

MSCI ESG Score

This rating measures the ability of a fund’s underlying holdings to manage key risks and opportunities arising from environmental, social and governance factors. It uses a 0-10 scale, allowing funds to be ranked or screened based on their ESG quality (MSCI, 2018). The calculation of this scale proceeds according to the following steps:

Step 1: Rescale fund holding weights to account for ESG coverage.

Fund holding weights are typically available based on the total fund value, but the weights used to calculate the Weighted Average ESG Score need to be adjusted for differences in ESG coverage as follows:

1. Start with holding weights disclosed by the fund (Wd).
2. Recalculate holding weights after removing all short positions (Ws).
3. Remove all securities that do not have an Overall ESG Score (Wc).
4. Rebase the remaining weights to add up to 100% (Wr).

An example of rescaled fund holding weights that account for ESG coverage is shown in table 1:

Table 1: Example of rescaled fund holding weights

Holding	Asset Class	Overall ESG Score	Weight (w_d)	Weight Excluding Short Positions (w_s)	Weight Excluding Uncovered Holdings (w_c)	Weight Rebased to 100% (w_r)
Corporate 1	Equity	5.8	36.4%	26.7%	26.7%	33.3%
Corporate 2	Equity	8.5	-36.4%			
Corporate 3	Bond	2.2	36.4%	26.7%	26.7%	33.3%
Sovereign 1	Bond	5	36.4%	26.7%	26.7%	33.3%
Corporate 4	Equity	Not rated	18.2%	13.3%		
Cash	Cash	Not rated	9.1%	6.7%		
Fund			**100%**	**100%**	**80%**	**100%**

Source: MSCI ESG Research

Step 2: Calculate the Fund Weighted Average ESG Score

The Fund Weighted Average ESG Score is calculated as the weighted average of Overall ESG Scores of a fund's underlying holdings using the rebased weights calculated in Step 1.

$$Fund\ Weigthed\ Average\ ESG\ Score = \sum_{i=1}^{n} (ESG_i) \times (W_{ir})$$

In this formula, the ESG_i is the Overall ESG Score of holding i. and the w_{ir} is the rebased weight of holding i.

The Overall ESG Score of a security held by a fund is assessed by taking either the Final Industry-Adjusted Company Score (for a company) or the Government Adjusted ESG Score (for a country) of the issuer. Table 2 gives an example showing calculation of Fund Weighted Average ESG Score.

Table 2: Example of fund weighted average ESG Score

Holding	Asset Class	Overall ESG Score	Weight Rebased to 100% (w_r)	ESG_i x ($w_{i,r}$)
Corporate 1	Equity	5.8	33.33%	1.93
Corporate 2	Equity	8.5		
Corporate 3	Bond	2.2	33.33%	0.73
Sovereign 1	Bond	5	33.33%	1.67
Corporate 4	Equity	Not rated		
Cash	Cash	Not rated		
Fund Weighted Average ESG Score:				**4.33**

Source: MSCI ESG Research

Step 3. Calculate the Fund ESG Quality Score.

The Fund ESG Quality Score is equal to the Fund Weighted Average ESG Score. The Fund ESG Rating is calculated as a direct mapping of the 0-10 Fund ESG Quality score to the letter rating categories of the Fund ESG Rating. Divided into seven equal parts, each corresponding to a Fund ESG Rating letter rating. Every possible Fund ESG Quality Score falls within the range of only one letter rating.

Table 3: Mapping of Fund ESG Quality Scores to Fund ESG Ratings

Fund ESG Quality Score	Fund ESG Rating
8.571-10.0	AAA
7.143-8.571*	AA
5.714-7.143	A
4.286-5.714	BBB
2.857-4.286	BB
1.429-2.857	B
0.0-1.429	CCC

*Soure: MSCI ESG Resarch *Appearance of overlap in the score ranges is due to rounding.*

In this study we only focus on the ESG Quality Score, because statistical analysis is easier to perform with these score and these are equivalent to the letter rating.

MSCI Impact Score

The Impact score of MSCI evaluates the broader impact of a fund's investments on society and the environment. It focuses on the positive contributions of a fund's portfolio to the Sustainable Development Goals (SDGs). The Impact score differs from the ESG score because it represents the percentage of a portfolio's revenue exposed to chosen impact factors or measures. Sustainable impact exposure is calculated as a company's sales in Sustainable Impact multiplied by percentage of a company's weight in a fund. In this case, the structure or matrix of the score is not as important as the definition of sustainable impact according to MSCI. Sustainable impact is defined as solutions that

support actionable thematic allocations aligned with the U.N. Sustainable Development Goals (SDGs). The score identifies funds that derive significant revenue from impact solutions. The MSCI Sustainable Impact Metrics consist of six Environmental Impact categories and seven Social Impact categories (see Figure 1) in which sustainable impact can be achieved, so that part of the proceeds counts as impact (MSCI, 2019).

Figure 1: MSCI Sustainable Impact Metrics

Source: MSCI ESG Sustainable Impact Metrics | FactSet, n.d.

The MSCI ESG and Impact scores were chosen for this research due to their widespread acceptance and relevance to sustainability assessments in financial markets. Given the different nature of the two sustainability scores, the MSCI Impact score is a valuable addition to the MSCI ESG score in this study.

Other sustainable ratings

Besides MSCI, there are many other Sustainable data providers in the market. The most important of these providers are Sustainalytics, Bloomberg, Moody's and S&P Global (SGanalytics, 2023). Sustainalytics is a subsidiary of the American financial services firm Morningstar. All of these providers offer similar products, including sustainable ratings and sustainable finance reviews in various global markets (Laoudai, 2024). The choice of the MSCI scores was based on their good reputation in this area and the availability of their scores in the FactSet work tool.

2.1.2. Sustainable Labels in Europe

Sustainable labels are certifications awarded to investment funds that meet specific criteria related to environmental, social, and governance (ESG) practices. These labels are intended to provide a standard of sustainability, helping investors identify funds that adhere to responsible investment principles. The criteria for these labels often include minimum exclusion standards, process-oriented evaluations, and transparency requirements. Sustainable labels can facilitate better communication and understanding between fund managers and investors by ensuring adherence to certain sustainability practices.

Fund labels often focus on the overall management process of a fund, including how ESG analysis is incorporated into investment decisions, the exclusion of certain controversial industries, and the

provision of comprehensive ESG reporting to clients. By adhering to these criteria, funds can signal their commitment to sustainability, attracting investors interested in responsible investment options (Hartzmark, 2017).

There are several major sustainability labels for mutual funds in Europe, displayed in Figure 2:

Figure 2: Overview of sustainable labels for mutual funds in Europe

Label (country)	Sponsor	Scope	Introduction date	ESG coverage
Umweltzeichen - Ecolabel in English (Austria)	Government	ESG	1990/**2004** for financial products	100%
Towards Sustainability (Belgium)	Not-for-profit organization*	ESG	February 2019	100%
Nordic Swan (Nordic countries)	Government	ESG	1989/ **June 2017** for financial products	90%
ISR (France)	Government	ESG	January 2016	90%
LuxFLAG ESG (Luxembourg)	Non-profit organization	ESG	May 2014	100%
FNG (Germany, Austria, Liechtenstein, and Switzerland)	Non-profit organization	ESG	2015	100%
LuxFLAG Climate Finance (Luxembourg)	Non-profit organization	Green	September 2016	100%
LuxFLAG Environment (Luxembourg)	Non-profit organization	Green	June 2011	100%
Greenfin (France)	Government	Green	December 2015	100%

Source: Ramos et al. (2023)

Although there are differences between a non-profit organization and a not-for-profit organization, the expression non-profit is used as an umbrella term for these types of organizations in this table.

The Lux FLAG ESG label for example is provided by the Luxembourg Finance Labelling Agency and this label covers 158 investment products and includes specific standards for microfinance, environment, ESG, climate finance, and green bonds. The Nordic Swan Ecolabel is with a founding year of 1989 the oldest sustainable label in this list, and has also approved mutual funds since 2017 and is at the moment covering 32 funds. The Green Fin Label is French label and certifies funds that contribute to energy and ecological transitions, established in 2013 (Swiss Sustainable Finance, n.d.)

In this research, we focus on the FNG and ISR labels due to their comprehensive and general sustainability criteria, extensive data availability and significant impact on European markets. Therefore, more information about these labels will be given below.

2.1.3. The FNG Label

This German label supported by a non-profit-organization started in 2015 and by 2023, 1670 funds had been labelled worldwide, primarily in Europe. The minimum requirements include meeting UCITS standards, compliance with Article 8 or 9 of the EU Sustainable Finance Disclosure Regulation, and various ESG criteria (Heijkants, 2020).

The label has set some general minimum requirements that a fund must meet to qualify for the FNG Label:

- Meeting the UCITS standards.
- Distributed in at least one of the following countries: Germany, Austria, Switzerland, or Liechtenstein.
- Compliance with Article 8 or 9 of the EU Sustainable Finance Disclosure Regulation (with a small number of exceptions).
- A fully completed and publicly available FNG Sustainability Profile.
- A fully completed (in accordance with the Eurosif guidelines) and publicly available European SRI Transparency Code declaration.
- Proof that all holdings in the portfolio are analysed according to ESG or other sustainability criteria.

In addition, the label also sets a minimum limit in terms of exclusion criteria for the funds in the following categories:

- Companies
    - Weapons
    - Nuclear energy
    - Fossil fuels
    - Tobacco
- Norm-based; based on the key principles of the UN Global Compact
    - Human rights
    - Labour rights
    - Environment
    - Bribery and corruption
- Countries; based on various internationally recognized standards
    - Human rights/democracy

- Environment
- Corruption
- Nuclear Non-Proliferation Treaty

The FNG label also consists of, on top of these minimum requirements and exclusions, a grading model with which a number of stars are awarded to a fund, based on Institutional Credibility, Product Standards and Portfolio Focus (Busch, 2024). This star rating is in addition to the awarding of the label. Because the ISR label does not provide a comparable assessment and this is therefore additional to whether or not the label is obtained, it was decided to ignore this star rating in this study and not to elaborate further on it. We focus on the 'basis' FNG label which consists out of above mentioned minimum requirements and exclusions (FNG-Siegel, 2024).

2.1.4. The ISR Label

This French label was created in 2016 and supported by the French Finance Ministry, this label aims to increase the visibility of SRI (Socially Responsible Investment) products. From the latest data available 1377 funds have been labelled with the ISR label. It covers funds that meet UCITS Directive and AIF requirements and is based on six pillars including ESG analysis, engagement policy, and transparency (Heijkants, 2020).

The label has some specific general minimum requirements for a fund. Eligible Funds are:

- Covered by the UCITS Directive.
- Alternative Investment Funds (AIF) without substantial leverage as defined by the AIFM Directive and French law categories.
- Checked for the existence of records in the GECO database of the AMF and confirming authorization under the relevant directives and articles.
- Committed to becoming a member of the label promotion body.

More specific, the ISR label mentions some requirements in the field of management mandates and some special cases which are not applicable to equity funds in Europe.

In addition to this requirements, the label has defined six pillars to organize the label's criteria:

Pilar I: Objectives:

- Clear description of financial and specific ESG objectives
- Consistency with the concept of double materiality

Pillar II: Issuer Analysis and Rating

- Clear description of ESG assessment methodology

- Documentation of tools, methods and the integration of climate issues
- Identification and monitoring of controversies

Pillar III: Inclusion of ESG Criteria in Portfolio

- ESG strategy definition and measurable results
- Prohibition of investment in excluded sectors
- At least 90% ESG-analysed issuers in the portfolio.

Pillar IV: ESG Engagement Policy

- Formalized voting and engagement policy with a significant exercise of voting rights
- Detailed engagement actions and escalation process.

Pillar V: Enhanced Transparency

- Clear communication with investors and distributors
- Annual ESG management report and complete portfolio inventory

Pillar VI: ESG Performance Monitoring

- Continuous monitoring and reporting of ESG performance.
- Gradual implementation of performance indicators.

All these pillars include different minimum requirements and standards to be achieved (SRI, 2024).

Comparison FNG and ISR label

Both Labels require funds to meet various ESG criteria and in this way demonstrate a commitment to sustainability. The first difference between the labels is their scope: the ISR label focuses on a broader range of fund types, including securities, real estate, and management mandates, whereas the FNG label is primarily focused on mutual funds. Both labels have strict exclusion criteria, but the specific sectors excluded and the implementation details differ slightly. The FNG label explicitly lists exclusions with revenue thresholds, while the ISR label includes exclusions as part of its broader ESG criteria. The FNG label uses a detailed grading model with weights assigned to various aspects of sustainability, while the ISR label focuses more on the fulfilment of specific ESG pillars without a weighted scoring system. Both labels require an independent assessment and verification process to ensure funds meet the required standards.

2.1.3. Differences between sustainable scores and labels

Fund labels are aimed at defining minimum requirements for sustainable funds while leaving room for the investor's interpretation. The criteria of these labels are commonly process-oriented, focusing on verifying whether ESG analysis is applied to select assets in the portfolio and ensuring that complete and comprehensible reporting is available to clients. Additionally, some labels apply minimum exclusion

criteria for unsustainable or controversial business practices, typically including areas like fossil fuels and controversial weapons (Heijkants, 2020).

Fund ratings are also aimed at comparing different mutual funds on their ESG performance. However, there are important differences between the interpretation and methodology of the two signals. To start with, there is no minimum requirement for a sustainable rating. While labels are obtained on the initiative of the fund's manager, fund ratings can be attributed to all sorts of funds, regardless of whether they have a committed ESG strategy (Heijkants, 2020).

Certain types of sustainable fund labels differentiate in the form of a grading system, but most labels do not distinguish between funds once a fund meets the minimum requirements and the label has been awarded. This is different in the case of ratings: ratings lend themselves better to comparisons among funds, because they differentiate between the different funds through the assigned rating score (Heijkants, 2020).

Fund ratings estimate the outcomes of the total company ESG ratings in a fund, while sustainable fund labels mainly reward a defined selection and investment process that considers criteria of the ESG pillars. It can be argued that ratings provide an idea of the ESG performance of the investment in the fund, while fund labels provide more information on the intention and approach of the fund's manager (Heijkants, 2020). This process can, for instance, include a sustainable reward structure for the board of a listed company that achieves sustainable long-term goals, which are not captured in ratings.

In conclusion, fund labels can provide investors with a standard of sustainability and facilitate clarity and communication in the selection process of a fund manager. Fund ratings provide information to compare investments that make up the fund. There could be a case that a fund with low ESG ratings might hold a sustainable label, but also the case that a fund which scores high in ESG ratings achieves this without an applied sustainable label.

2.2. Equity fund's performance

Performance, in the context of equity funds, refers to how well a fund achieves its investment objectives, typically evaluated through various financial metrics. Performance metrics can include total return, risk-adjusted return, alpha, beta, Sharpe ratio, and others. These metrics help investors assess whether a fund meets their investment goals and risk tolerance.

This research will focus on the total return as the key metric, as it is one of the most comprehensive measures of an equity fund's (financial) performance. It includes both capital appreciation (the increase of a fund's price) and income from dividends over a specified period. Unlike metrics that focus solely on price changes or income, total return combines both elements, providing a more comprehensive assessment of how well the fund has performed over time. Total return is expressed as a percentage and provides a complete picture of a fund's profitability, accounting for all sources of return.

The formula for total return is:

$$Total\ return = \frac{Starting\ price - Ending\ price + Dividens\ or\ interests\ paid}{Starting\ price} \times 100$$

Factors influencing fund performance

Several factors can influence the performance of an equity fund, including: the assets under management, Fund in and outflows, the strategy of a fund or market conditions.

Furthermore, additional factors such as sustainable ratings and labels might influence the performance of a fund, according to the literature in this field discussed in the next section.

2.3. The impact of sustainable signals on equity fund's performance

The relationship between sustainable signals, such as ESG scores and sustainability labels, and the financial performance of funds has been a focal point of numerous studies, showing mixed results. In this paragraph the literature on the relationship between sustainable signals and equity fund's financial performance will be discussed.

Zehir & Aybars did research on the effect of ESG scores on portfolio performance in Europe and Turkey. They use ESG scores to rank stocks and form portfolios. They create portfolios by selecting the top and bottom 10% of stocks based on their ESG scores. The performance of the portfolio is assessed using the Capital Asset Pricing Model (CAPM) and the Fama-French three-factor model. The findings from the CAPM show that portfolios constructed based on ESG scores generally underperform the market index. Only two portfolios show significant abnormal returns. The three-factor model reveals that bottom ESG and bottom governance (GOV) portfolios slightly outperform the market, suggesting that low ESG and GOV scores might yield higher returns. The authors acknowledge limitations in their study, including the potential for data and model specification issues, especially concerning perfect collinearity in some variables. Overall, the study concludes that while ESG scores do not necessarily lead to superior portfolio performance, they play a crucial role in aligning investments with broader social and environmental goals (Zehir & Aybars, 2020).

There is also academic literature that examines the effect of the introduction of Morningstar's Sustainability Rating on mutual fund flows. In the paper of Ammann et al. (2018), they find divergence between the reactions of retail investors and institutional investors on this rating. They find strong evidence that retail investors shift money away from low-rated and into high-rated funds, but institutional investors react much more weakly to the publication of this specific rating. These results of Ammann et al. are also in line with the findings of the paper of Hartzmark & Sussman. This is interesting because of the comparability of the two scores in terms of content, but also because of the fact that MSCI is with their own ESG fund metrics Morningstar's main rival in this field at the moment. Arguably it

has kept a slightly lower profile than the Morningstar ranking, and attracted less attention (Verney, 2019).

Another paper published about the relationship between Morningstar's ESG ratings and mutual funds' performance by Steen et al. (2019), examines the relationship between Morningstar's ESG ratings and the performance of funds domiciled in Norway is analysed. The authors didn't find evidence of rating level effects, nor did they find abnormal risk-adjusted returns (alphas). However, they investigated if there was geographical bias in the distribution of sustainable ratings. Analysing the European categorized funds separately, they find significantly higher returns and positive alphas for the funds classified in the top ESG quintiles. Furthermore, they find evidence that fund performance improve in parallel with improved ESG ratings (Steen et al., 2019). This findings are also in line with the paper of Abate et al. (2021).

Various studies also have already been conducted in the field of sustainability labels for mutual funds. The paper of Ramos et al. (2022) finds divergence between sustainable labels and certifications sponsored by governments and independent organizations versus private sector organizations. They also conclude that sustainable labels address information asymmetries, but also act as mechanisms for reducing investor's search costs and increasing transparency in the market. Their results uncover divergent signals from several sustainability labels and certifications, which raises concerns about whether labels fulfil their purpose of credible informational cues (Ramos et al., 2022).

This is also found by Hartzmark & Sussman (2017), who found causal evidence that investors market wide value sustainability. Hartzmark and Sussman performed a natural experiment examining ranking and fund flows. Their paper suggests that sustainability is viewed as positively predicting future performance, but they do not find evidence that high-sustainability funds outperform low-sustainability funds. Their evidence is consistent with positive affect influencing expectations of sustainable fund performance and nonpecuniary motives influencing investment decisions (Hartzmark & Sussman, 2017).

The most recent research in this area originates from almost the same group of researchers who conducted the study by Ramos et al. (2022). They have conducted a new study where they investigate the influence of sustainability labels in mutual fund flows in a setting where a multiplicity of labels coexist. After being awarded a GNPO label, mutual funds attract additional flows, compared to comparable funds. This impact is more pronounced for funds with another sustainable signal, such as Morningstar top globes or an ESG name, irrespective of whether they hold low or high sustainability standards. These results thus suggest a complementary effect of a GNPO label, SFDR label and other sustainability labels (Ramos et al., 2023).

In their paper, Becker et al. (2022) discuss their research findings indicating that funds affected by the policy intervention increase their sustainability rating. Additionally, they find that a better ESG label

leads to larger fund net inflows. They conclude that the intervention of the SFDR sustainability labels (the different articles) so far achieved its purpose of moving capital into more sustainable investments. They find that investors appreciate a higher degree of ESG alignment and allocate their capital accordingly. In this study they also find a higher average total return for funds labelled with article 9 funds, compared to article 6 or 7 funds.

In summary, despite the fact that no evidence was found in the research by Zehir & Aybars (2020), there is various research that confirms that sustainable scores have a positive influence on the total return of mutual funds. The research by Ammann et al. (2018) makes the connection between ESG scores and fund inflows and the research by Steen et al. (2019) goes one step further. Here, analysing the European categorized funds, it is found that funds with high ESG scores also achieve significantly higher returns. Furthermore, they find evidence that fund performance improve in parallel with improved ESG ratings. This same result is found in the study by Verheyden et al. (2016). They report "an unequivocally positive" contribution to returns when using their ESG screening approach. In addition, research by Milonas et al. (2022) provides more confirmation of signs that sustainable scores have a positive influence on the performance of equity funds.

This relationship has also been investigated for sustainable funds and the research by Ramos et al. (2023) shows a complementary effect on the fund inflow of various sustainable labels. The conclusion of Becker et al. (2022) is in line with this. The relationship between sustainability labels and the performance of a fund defined as total return instead of fund in or outflows has not yet been investigated in depth

2.4. Hypotheses

Taking into account all these different findings in the field of ESG ratings and sustainability labels in relation to fund performance, the following hypotheses have been drawn up to answer the sub-questions and ultimately the main question of this thesis.

The first sub-question is: *What is the relation between the sustainable score and a fund's performance?* To answer this sub-question the following hypotheses have been formulated:

1. There is a significant positive relationship between the MSCI ESG score and the Performance of a fund (Total returnNAV).
2. There is a significant positive relationship between the MSCI Impact score and the Performance of a fund (Total returnNAV).

The reasoning behind these two hypotheses come from the research of Verheyden et al. (2016). The authors report "an unequivocally positive" contribution to returns when using their ESG screening

approach, both on a global and a developed markets universe. The research of Milonas et al. (2022) is in line with this, they investigated European and American funds over a period of 4 years (2017-2021) and found that there was statistically significant difference between ESG and non-ESG funds although the former had slightly higher returns than the latter. The MSCI ESG score is essentially a score that results from a matrix, which is actually a large ESG screening in many areas. In addition to these two research articles, MSCI has also conducted its own research into the relationship between its own MSCI rating and the performance of a fund. They consolidate findings from various academic and industry researchers, and they observe significant evidence that the MSCI ESG ratings may have helped reduce systematic and stock-specific risks in investment portfolios (Giese et al., 2019). To contribute to the existing literature mentioned, the MSCI Impact score is included in the second hypothesis and for both hypotheses the focus is on the Total Return NAV, instead of on a risk-adjusted return variable.

Based on the literature, it is expected that the presence of a sustainable label will positively affect the performance of a fund. However, the effect of the combination of the level of an ESG or impact score and having one or more sustainable labels as a fund has not yet been investigated as far as this literature review reaches. The effect of any label in combination with the MSCI ESG or Impact score will be investigated, but also the labels separately, to map out how these different labels may have a different effect on the total return of a fund in combination with the MSCI ESG or Impact score.

The second sub question contributing to the research question is: Is this relationship moderated if the fund is labelled by the FNG and/or ISR?

Any label:

3. The effect of the MSCI ESG score on the performance of a fund is stronger for labelled funds.
4. The effect of the MSCI Impact score on the performance of a fund is stronger for labelled funds.

FNG label:

5. The effect of the MSCI ESG score on the performance of a fund is stronger for a FNG labelled fund.
6. The effect of the MSCI Impact score on the performance of a fund is stronger for a FNG labelled fund.

ISR label:

7. The effect of the MSCI ESG score on the performance of a fund is stronger for a ISR labelled fund.
8. The effect of the MSCI Impact score on the performance of a fund is stronger for a ISR labelled fund.

Both labels:

9. The effect of the MSCI ESG score on the performance of a fund is stronger for a fund labelled by both the FNG and ISR label.
10. The effect of the MSCI Impact score on the performance of a fund is stronger for a fund labelled by both the FNG and ISR label.

3. Methodology

This chapter provides a detailed description of the research design, data collection, sample, operationalization of variables and data analysis methods.

3.1. Study design

This study employs a quantitative research design using panel data regression and moderation analysis to investigate the impact of sustainable signals on the performance of equity funds in Europe. This design is well-suited for capturing both cross-sectional and time-series variations, allowing for a comprehensive examination of how ESG and Impact scores influence fund performance over time. Additionally, the moderating effect of the FNG and ISR labels on this relationship is explored to understand how these certifications impact the performance dynamics of equity funds.

3.2. Data collection and Sample

Data collection

The data for this research is derived from three primary sources: online research, FactSet and Morningstar. The lists of the funds labelled with the FNG and/or ISR labels are obtained from their respective websites, which are publicly available. The financial data related to these funds was retrieved using the FactSet add-in for Excel. Additional (unlabelled) fund data, including detailed information on the funds, was retrieved from Morningstar. The data from these different sources were combined to create one dataset in Excel and then uploaded to Stata.

Sample

For the labelled funds, the initial sample included all funds listed with the FNG and/or ISR labels on their respective websites .

- Domicile = All Europe

For the unlabelled funds, the data of funds without an FNG or ISR label, was derived from Morningstar , based on the following criteria:

- Global broad category = equity
- Domicile = All Europe
- Investment Area = Europe
- Only surviving funds

Duplicate funds, funds not legally registered in Europe and funds not primarily focused on equity were removed from the dataset.

Time period

This research is based on monthly fund data in the period from January 2017 to December 2023. There are several reasons for choosing this specific period. The first is the availability of the data. This research uses public data sources, which means that the availability of this data decreases sharply as the period moves further into the past. Data availability is also a problem with the independent variables; MSCI has only introduced their ESG score and Impact score to the market since mid-2016, so to choose a rounded period, the start date of January 2017 was chosen. Another reason for choosing this period is that it covers a two-year period (2017-2019) before the global Covid-19 pandemic, the entire period of the pandemic (2020-2021), but also two years afterwards in which the world (economy) recovered from this pandemic. An effort has been made to balance this dataset to minimize the impact of the pandemic on the research findings.

3.3. Operationalization and Variables

In this paragraph an overview of the studied variables and operationalization will be given.

Variables

Table 4: Study variables

	Variable	Source	Details
Dependent variable	Total return NAV	FactSet	US dollars, daily accrued dividends included, monthly-end, calculated using daily accrued distributions.
Independent variables	ESG Score	MSCI, FactSet	0-10 points
	Impact Score	MSCI, FactSet	0-100 points
Control variables	AUM	FactSet	US dollars
	Fund Inflows and Outflows	FactSet	US dollars
Fixed effects	Equity style	Morningstar, FactSet	23 different countries
	Domicile	Morningstar, FactSet	6 different styles
Moderating variables	Presence of sustainability labels (any label, FNG, ISR, both labels)	FNG, ISR	Two different labels

Dependent variable

The dependent variable – *equity funds performance* – was measured with the *net asset value (NAV) total return.* In this study, the total return is chosen as the sole indicator of the financial performance of the funds, as it captures the overall profitability by accounting for both capital appreciation and income from dividends or interest, offering a good picture of how well a fund is performing over time. The total return measures the overall performance of a fund, including all income generated from dividends and interests, as well as any capital gains or losses. It is calculated as the net asset value (NAV) total return, which includes the reinvestment of all dividends on a gross basis. This data is retrieved from FactSet. The data is measured in US dollars and daily accrued dividends are included on a monthly-end basis.

Independent variables

In this study, the independent variables - *sustainable signals* – are operationalized through two key metrics: the ESG score and the Impact score. These scores serve as reliable proxies for the sustainability credentials of equity funds in Europe.

The *ESG (Environmental, Social and Governance)* score evaluates the ability of a fund's underlying holdings to manage the risks and opportunities arising from environmental, social and governance factors.

The *Impact score* represents the percentage of a portfolio's revenue exposed to chosen impact factors or measures. This score indicates the extent to which a company's operations and products contribute to positive social and environmental outcomes. The sustainable impact exposure of a company is calculated based on the sales in sustainable impact sectors, adjusted by the company's weight in the fund.

By quantifying the sustainable signals through ESG and Impact scores, this study aims to analyse how sustainability practices influence the financial results of equity funds in Europe.

Control variables

In this study, two control variables are included: *Assets Under Management (AUM) and Fund Inflows and Outflows,* These variables are included in the research because it is expected that they substantially influence the (financial) performance of a fund and help isolate the impact of sustainable signals on the total return.

AUM is an important indicator of a fund's size and investor confidence. It reflects the total market value of the assets that a fund manages on behalf of its investors. A larger AUM typically indicates greater investor trust and more resources available for investment, which influences the performance of a fund. In this statistical analysis the natural logarithm of the AUM variable is used, giving the variable a more

logical interpretation in the regression against the Total return NAV, which is expressed in percentage points.

Fund Inflows and Outflows measure the net movement of money into and out of a fund. These flows are crucial indicators of investor behaviour and sentiment. Inflows for instance indicate new investments providing additional capital, potentially enhancing the performance, while outflows represent withdrawals, signalling potential dissatisfaction or concerns of investors. Including Fund Inflows and Outflows as a control variable in this study, helps account for the effects of investor behaviour on the equity fund's performance, because sudden large inflows or outflows can affect a fund's investment strategy and liquidity management, impacting its total return. In this study the Fund Inflows and Outflows are calculated as the percentage change in the fund's total net assets over a specific period, based on the data from FactSet. The following formula for percentage change in fund flows was used:

$$Percentage\ change\ in\ Fund\ Flows_{it} = \frac{TNA_{it} - TNA_{it-1}}{TNA_{it-1}} \times 100$$

Where TNA_{it} is the total net assets at time (t) for fund (i), and TNA_{it-1} is the total net assets at time (t) -1 .

Fixed effects

Two different fixed effects are used to control for variation specific to equity styles and domiciles. It ensures that the results are not distorted by unobserved, time-invariant equity style or country characteristics.

Equity style refers to the categorization of equity funds based on the size of the companies in their portfolios and their investment strategy, which can be value-oriented or growth-oriented. This classification helps to control for differences in investment performance that may arise from these factors. It is categorized into six groups: small value, small growth, mid value, mid growth, large value, and large growth. Value-oriented funds focus on stocks that appear undervalued based on financial metrics, while growth-oriented funds invest in companies expected to grow at an above-average rate. This categorization helps control for the effect of fund size and investment style on performance. To incorporate equity style into the analysis, dummy variables are created for each category: small value (0=if no, 1=if yes), small growth (0=if no, 1=if yes), mid value (0=if no, 1=if yes), mid growth (0=if no, 1=if yes), large value (0=if no, 1=if yes) and large growth (0=if no, 1=if yes). This allows for precise measurement of the impact of each equity style on fund performance.

Domicile refers to the country where the fund is based. This variable controls for country specific-factors that might influence fund performance, such as regulatory environment, tax policies, and economic conditions. To represent domicile in the analysis, dummy variables are created for each country (e.g.,

Germany: yes=1, no=0; France: yes=1, no=0). This method ensures that the study accounts for the diverse regulatory and economic contexts in which the funds operate.

Moderating variables

In this study, the moderating variables are the *presence of sustainability labels*: the presence of a sustainable label in general, the FNG label, the ISR label and both labels. These labels indicate whether a fund adheres to specific minimum sustainable investment criteria and reporting standards and can influence how the ESG and Impact score impact fund performance.

In Stata, these moderating variables are created as dummy variables to facilitate interaction terms in the regression models. Each fund is assigned a value of 1 if it has the respective label and 0 if otherwise. As a result, four dummy variables were created to represent the presence of a sustainability label: the presence any label (0=if no, 1=if yes), the presence of the FNG label (0=if no, 1=if yes), the presence of the ISR label (0=if no, 1=if yes) and the presence of both labels (0=if no, 1=if yes).

By including these moderating variables, this study aims to provide a deeper understanding of how sustainability labels influence the effectiveness of the ESG and Impact scores on fund performance. By including the interaction terms in the regression models, this approach allows for an examination of how the presence of the labels modifies the effect of the ESG and Impact scores on the fund performance.

3.4. Data analysis

To test the hypotheses, a panel data regression and moderation analysis were conducted with Stata.

To test the first two hypotheses, a panel data regression analysis allows to estimate whether the Total Return NAV is related to the ESG (X_1), and Impact (X_2) scores, controlling with the variables of AUM (log) (X_3), Funds Inflows and Outflows (percentage change) (X_4) and the fixed effects of Style (X_5) and Domicile (X_6) are included in this regression. The formula can be formalized as:

$$Total\ Return\ NAV = \alpha + \beta_1 ESG + \beta_2 Impact + \beta_3 AUM + \beta_4 FIO + \beta_5 EqSt\ (fe) + \beta_6 Dom(fe) + \epsilon$$

In these formulas the α denotes the intercept (starting) point of the formula and β determines the slope of the variables. Generally, a higher β indicates a stronger effect, but this is relative to the scale of the independent variable.

To test the third through tenth research hypotheses, the panel data regression analysis will estimate to what extent this effect is moderated by the presence of a sustainable label. This formulas can be formalized as:

$$Total\ Return\ NAV = \alpha + \beta_1 ESG + \beta_2 Impact + \beta_3 AUM + \beta_4 FIO + \beta_5 EqSt\ (fe) + \beta_6 Dom(fe) + \beta_7 (ESG * Sustainable\ Label(0\ or\ 1)) + \beta_8 (ESG * FNG\ label(0\ or\ 1)) + \beta_9 (ESG * ISR\ label(0\ or\ 1)) + \beta_{10} (ESG * Both\ Labels(0\ or\ 1)) + \beta_{11} (Impact * Sustainable\ Label(0\ or\ 1)) + \beta_{12} (Impact * FNG\ label(0\ or\ 1)) + \beta_{13} (Impact * ISR\ label(0\ or\ 1)) + \beta_{14} (Impact * Both\ Labels(0\ or\ 1)) + \epsilon$$

In these formulas the α denotes the intercept (starting) point of the formula and β determines the slope of the variables. Generally, a higher β indicates a stronger effect, but this is relative to the scale of the independent variable. In this formula β_7, β_8, β_9, β_{10} are the slope of the interaction terms of the ESG scores and the presence of a sustainability label, and β_{11}, β_{12}, β_{13}, β_{14} are the slope of the interaction terms of the Impact scores and the presence of a sustainability label. Lastly, ϵ is the residual.

Before the analysis, tests were performed to test the assumptions of the panel regression data, including the Breusch-Pagan test, the Variance Inflation Factor (VIF), the Hausman test and the Durban-Watson test .

4. Results

4.1. Descriptive statistics

In this study the sample size is N= 2925 funds, with monthly data over a period of January 2017 till December 2023 (the measuring point is on the last day of the month). In the dataset there are 164 funds labelled by FNG, 39 funds labelled by ISR, 5 funds labelled by both and 2744 funds without any of these sustainable labels.

The means and standard deviations of the key variables are displayed in Table 5. The table shows the summary statistics for the Total Return NAV, ESG Score, Impact Score, AUM and Fund Inflows and Outflows. These statistics provide an overview of the data distribution and variability. The average Total Return NAV shows a relatively modest average decrease of 3.55%, but with a very large standard deviation of 59.446, indicating high variability in fund performance. The ESG Score and Impact Scores have means of 8.022 and 8.898 respectively, with relatively lower variability. Here it must be noted the ESG Score is calculated on a scale of 0 to 10 and the Impact Score on a scale of 0 to 100. For AUM both the "absolute" as the logarithmic variable are reported. The logarithmic-transformed AUM mean is 19.793, suggesting a wide range of fund sizes. The high standard deviations for Fund Inflows and Outflows show variation.

Table 5: Descriptive Statistics for Key Variables

Variable	Mean	SD
Total Return NAV (*percentage change*)	3.550	59.446
ESG Score	8.022	.980
Impact Score	8.698	6.980
AUM (*in US Dollars*)	$8.96 * 10^8$	$2.04*10^9$
AUM (log)	19.793	1.417
Fund Inflows and Outflows (*in US Dollars*)	187,777.400	$2.50*10^8$
Fund Inflows and Outflows (*in percentage change*)	$6.92*10^7$	$5.81*10^9$

The frequency distribution of the equity styles of the funds and the labels in our sample are displayed in Table 6. The table shows the breakdown of funds by equity style and the presence of sustainability labels, providing insight into the composition and categorization of the sample in this study.

Table 6: Frequency Distribution of Equity Styles

Equity Style	Frequency	Percentage
Small Value	11	0.38
Small Growth	32	1.09
Mid Value	185	6.32
Mid Growth	382	13.06
Large Value	602	20.58
Large Growth	1713	58.56

Table 7: Frequency Distribution of Labels

Label	Frequency	Percentage
If Any Label	181	6.19
No Label	2744	93.81
FNG Label	138	4.72
ISR Label	38	1.30
Both Labels	5	0.17

The equity style distribution indicates that the majority of the funds are classified as large growth (58.56%), followed by large value (20.58%) and mid growth (13.06%). The frequency distribution of labels in Table 7 shows that most funds do not have a sustainability label (93.81%), with a smaller proportion having some form of sustainability label, including FNG and ISR labels.

The frequency distribution of the domicile countries of the funds in our sample are displayed in Table 8. The table shows that most funds are from Luxembourg, namely 73.06% of the funds, followed by France (8.82%) and Ireland (6.60%), while other countries have smaller representations.

Table 8: Frequency Distribution of Domicile

Country	Frequency	Percentage	Country	Frequency	Percentage
Austria	88	3.01	Luxembourg	2137	73.06
Belgium	67	2.29	Netherlands	7	0.24
Denmark	3	0.10	Norway	2	0.07
France	258	8.82	Spain	1	0.03
Germany	78	2.67	Sweden	1	0.03
Ireland	193	6.60	Switzerland	53	1.81
Italy	7	0.24	United Kingdom	25	0.85
Liechtenstein	5	0.17			

The descriptive statistics for the equity funds grouped by the (presence of) sustainable labels are displayed in Table 9. The table shows the means and standard deviations for the Total Return NAV, ESG Score, Impact Score, AUM (log) and Fund Inflows and Outflows (percentage change).

Table 9: Descriptive Statistics for Equity Funds Grouped by Sustainability Labels

	Total Return NAV		ESG Score		Impact Score		AUM (log)		Fund Inflows/Inflows (percentage change)	
Label	Mean	SD.	Mean	SD.	Mean	SD.	Mean	SD.	Mean	SD.
If Any Label	5.382	5.169	7.602	1.098	11.106	6.706	19.897	1.203	7611.894	140575.5554
No Label	6.164	5.043	8.060	0.981	8.870	7.346	19.872	1.388	$7.35*10^7$	$5.99*10^9$
FNG Label	5.513	5.124	7.598	1.071	11.865	7.111	19.834	1.162	10902.24	167705
ISR Label	5.259	5.293	7.576	1.162	9.123	5.261	20.072	1.350	-145.887	3164.891
Both Labels	3.543	5.013	7.902	1.142	10.877	4.848	19.833	0.502	-140.924	592.351

The average Total Return NAV ranges from 3.543 to 6.164 across the different label categories. The average ESG Score is relatively consistent, with the highest mean score of 8.060 for funds with no label. The Impact Scores varies relatively more, with the highest mean of 11.865 for funds with the FNG label. The average AUM (log) is fairly consistent across all categories, and for the Fund Inflows and Outflows (percentage change) it is notable that funds with no label have on average larger Fund Inflows and Outflows, highlighting a difference in this aspect compared to other categories.

Table 10 shows the correlation for the study variables. The correlation matrix shows the correlations between key variables in this study, providing insight into their associations. In the interest of readability, the dummy variables for Domicile were not included in the correlation matrix. This decision was made to simply the analysis and focus on the core variables relevant to this study.

Table 10: Correlation matrix for key variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Tot. Ret. NAV		.407***	.144***	-.012***	-.003	-.018*	.005	.001	.004	-.021**	.033***	-.036***	-.025**	-.021**	-.022**
2. ESG S			.135***	.028***	.000	-.035***	-.118***	-.048***	.123***	.003	.081***	-.107***	-.090***	-.057***	-.006
3. Impact S				-.133***	-.003	-.000	-.033***	.377***	-.070***	-.145***	-.029***	.071***	0.080***	.002	.011
4. AUM(log)					.001	-.066***	-.022**	-.120***	.003	-.043***	.099***	.004	-.006	.018*	-.001
5. FIO						-.001	-.001	-.002	-.003	-.004	-.008	-.003	-.002	-.002	-.001
6. ES: SV							-.003	-.008	-.012	-.015	-.030***	-.010	-.009	-.010	-.002
7. ES: SG								-.015	-.022**	-.029***	-.055***	.020**	-.016	-.066***	-.003
8. ES: MV									-.055***	-.071***	-.135***	-.033***	-.037***	-.001	-.008
9. ES: MG										-.103***	-.197***	-029***	-.033***	-.003	.006
10. ES: LV											-.256***	-.076***	-.063***	-.037***	-.016
11. ES: LG												.307***	.270***	.132***	.051***
12. If label													.831***	.534***	.175***
13. If FNG														-.025**	.009
14. If ISR															-.005
15. If both															

Note: * p < .1; ** p <.05; *** p < .01

4.2. Hypothesis testing

Table 11 shows the results of the regression analyses. In the table the coefficients, standard errors and significance are described for each regression model individually. The first regression analysis regressed the ESG Score, Impact Score, AUM(log) Fund Inflows and Outflows (percentage change) and included the Country and Equity Style fixed effects. The second, third, fourth and fifth regression included the interaction terms of the presence of a sustainability label, respectively if any label, if FNG, if ISR and if both.

Table 11: Results of panel data regression

Dependent variable: Total Return NAV					
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
ESG score	2.121***	2.138***	2.130***	2.126***	2.124***
	(.056)	(.056)	(.056)	(.056)	(.056)
Impact score	.060***	.053***	.055***	.059 ***	.060***
	(.009)	(.009)	(.009)	(.009)	(.009)
AUM	-.392***	-.393***	-.393***	-.393***	-.392***
(log)	(.035)	(.035)	(.035)	(.035)	(.035)
Fund Inflows and Outflows	-.000***	-.000***	.000***	.000***	.000***
(percentage change)	(.000)	(.035)	(.000)	(.000)	(.000)
Domicile: Austria	.058	.330	.101	.038	.064
	(.369)	(.434)	(.486)	(.370)	(.369)
Domicile: Belgium	1.975***	2.240***	2.014***	1.958***	1.980***
	(.380)	(.446)	(.497)	(.380)	(.380)
Domicile: Denmark	.933	1.164	.948	.901	.941
	(1.899)	(1.900)	(1.916)	(1.897)	(1.898)
Domicile: France	-1.047***	-.765*	-1.013**	-1.098***	-1.025***
	(.313)	(3.788)	(.446)	(.316)	(.313)
Domicile: Germany	.787**	1.034**	.839*	.765 **	.793**
	(.383)	(.438)	(.481)	(.384)	(.384)
Domicile: Ireland	.535	.772*	.551	.518	.536
	(.343)	(.409)	(.462)	(.344)	(.343)
Domicile: Italy	1.190*	1.438**	1.213*	1.166*	1.197*
	(.615)	(.653)	(.691)	(.612)	(.616)
Domicile: Liechtenstein	.062***	2.279***	2.067***	2.030***	2.067***
	(.656)	(.682)	(.718)	(.655)	(.657)
Domicile: Luxembourg	.505*	.742**	.526	.478*	.513*
	(.284)	(.360)	(.421)	(.285)	(.285)
Domicile: Netherlands	1.606	1.868	1.641	1.587	1.612
	(1.229)	(1.235)	(1.256)	(1.231)	(1.228)
Domicile: Norway	-.537	-.289	-.510	-.565	-.528
	(.981)	(1.006)	(1.029)	(.982)	(.981)
Domicile: Spain	3.865***	4.121***	3.900***	3.841***	3.875***
	(.292)	(.369)	(.430)	(.293)	(.292)
Domicile: Sweden	-2.288***	-2.040***	-2.260***	-2.316***	-2.280***
	(.292)	(.363)	(.424)	(.291)	(.290)
Domicile: Switzerland	0.378	.621	.402	.351	.386
	(.418)	(.473)	(.521)	(.419)	(.418)
Domicile: United Kingdom	1.838***	2.095***	1.873***	1.812***	1.845***
	(.551)	(.597)	(.636)	(.552)	(.551)
Equity Style: Large Growth	.586***	.594***	.607***	.565***	.596
	(.106)	(.108)	(.107)	(.107)	(.106)

Equity Style: Large Value	.263*	.248*	.252*	.262*	.262
	(.140)	(.140)	(.140)	(.140)	(.140)
Equity Style: Mid Growth	1.601***	1.601***	1.601***	1.599***	1.610
	(.197)	(.196)	(.196)	(.196)	(.197)
Equity Style: Mid Value	-.398	-.290	-.329	-.382	-.391
	(.425)	(.419)	(.421)	(.425)	(.425)
Equity Style: Small Growth	4.843***	4.831***	-.329	4.795***	4.838
	(.569)	(.566)	(.421)	(.594)	(.569)
Equity Style: Small Value	-1.613	-1.590	-1.607	-1.614	-1.609
	(1.273)	(1.273)	(1.276)	(1.273)	(1.272)
Presence of any label (no=o; yes=1)* ESG Score		-.148*** (.048)			
Presence of any label (no=o; yes=1)* Impact Score		.105*** (.028)			
Presence of the FNG label (no=o; yes=1)* ESG Score			-.174*** (.059)		
Presence of the FNG label (no=o; yes=1) * Impact Score			.103*** (.031)		
Presence of the ISR label (no=o; yes=1) * ESG Score				-.055 (.080)	
Presence of the ISR label (no=o; yes=1) * Impact Score				.104** (.052)	
Presence of both labels (no=o; yes=1) * ESG Score					-.782*** (.080)
Presence of both labels (no=o; yes=1) * Impact Score					.371*** (.056)
Domicile Fixed Effects	Yes	Yes	Yes	Yes	Yes
Equity Style Fixed Effects	Yes	Yes	Yes	Yes	Yest
Constant	-4.505	-4.813	-4.545	-4.478	-4.525
	(.856)	(.866)	(.890)	(.858)	(.856)
R^2 (within)	.200	.199	.200	.200	.200
Observations	9694	9694	9694	9694	9694
Groups	2925	2925	2925	2925	2925

The first regression model regressed the ESG Scores and Impact Scores as independent variables and the AUM(log) and Fund Inflows and Outflows (percentage change) as control variables. The Equity Style and Domicile variables were applied as style and country fixed effects to control for differences between different domiciles and equity styles of the funds in the analysis.

The coefficient of the ESG Score variable is 2.121 and indicates significant at the 1% level, meaning that a one point increase in the ESG Score of a fund is associated with a increase in Total Return NAV by 2.121 percentage points, holding other variables constant. The interpretation of this is that higher

ESG Scores are associated with significantly higher total return of funds, indicating a positive relation. The first hypothesis - *there is a significant positive relationship between the MSCI ESG score and the Performance of a fund (Total Return NAV)* – can be accepted based on the above results.

The coefficient of the Impact Score variable is .060 and significant at the 1% level, meaning that a one point increase in the Impact Score of a fund is associated with an increase in Total Return NAV by .060 percentage points, holding other variables constant. The interpretation of these results is that higher Impact Scores are associated with significantly higher Total Return. The second hypothesis - *there is a significant positive relationship between the MSCI Impact Score and the Performance of a fund (Total return NAV*). This hypothesis can be accepted, based on the above result.

The control variables in the first regression, the AUM(log) and Fund Inflows and Outflows (percentage change) both have negative coefficients, respectively -.392 and $-1.92 * 10^{12}$. These two coefficients are both statistically significant at the 1% level. The interpretation of the coefficient of the AUM(log) variable is that for every 1 percent change in AUM, the Total Return NAV is estimated to decrease by 0.392 percentage point. Larger funds (in terms of AUM) tend to have lower NAV returns, which could suggest diminishing returns to scale or other complexities associated with managing larger funds. The coefficient of the Fund Inflows and Outflows (percentage change) variable is very low, which indicates that changes in Fund Inflows and Outflows are little but significant negative related to Total Return NAV. The negative impact indicates that higher volatility in Fund Inflows and Outflows may adversely relate to the fund performance.

Different domiciles show varied relations with the Total Return NAV, reflecting possible differences in regional market conditions, regulations, and fund management practices. The notable outliers here are Spain and Sweden. The country variable Spain has a positive significant coefficient of 3.865 and this variable for Sweden has a negative significant coefficient -2.288. The different Equity Styles of the funds studied are also related to the Total Return NAV of the funds; the funds with the Large Growth, Mid Growth and Small Growth Equity Style show significantly better performance in terms of Total Return NAV, the same goes for Large Value but only at the 10% significance level and the Equity Styles Small Value and Mid Value show no significance. These results highlight the importance of considering both the Domicile and Equity style of funds when evaluating their performance in Total Return NAV. Different countries and Equity Styles exhibit varying impacts on fund performance, suggesting that regional factors and specific investment strategies significantly relate to financial returns.

Interpreting the summary statistics of the first regression, the within R-squared of 0.200 indicates that approximately 20% of the variability in the dependent variable (Total Return NAV) is explained by the independent variables in the model.

In the second regression, the interaction terms for the presence of any label (0=no, 1=if yes) was added, involving both the ESG Score and the Impact Score. This model explores how the relationship between the sustainable signals (ESG Score and Impact Score) and the Total Return NAV of the equity funds may be influenced by the presence of sustainability labels.

Including these interaction terms leads to a small change in the ESG Score and Impact Score variables compared to previous regression, but the coefficients of the ESG Score and Impact Score remain approximately constant and as significant as they were. The results of the control variables remain completely or almost completely the same as in the first regression where no interaction terms had yet been added to the model. The R-squared of the model stays almost exactly the same in this second regression, which suggests that the interaction terms do not provide much additional explanatory value to the model.

The coefficient of the included first interaction term (Presence of any label * ESG Score) is -0.148 and indicates significance at the 1% level. This indicates that the presence of any label negatively moderates the relationship between the ESG Scores and the Total Return NAV. The coefficient of the second interaction term (Presence of any label * Impact Score) is 0.105, also indicating significance at the 1% level. This indicates that the presence of any label positively moderates the relationship between the Impact Scores and the Total Return NAV.

These findings indicate that the presence of any sustainable label moderates the relationship between the ESG Scores and the Total Return NAV and the Impact Score and the Total Return NAV. However, it is important to note here that the moderating effect is negative for the presence of a label on the ESG Score and positive for the presence of a label on the Impact Score. Therefore, the third hypothesis - *the effect of the MSCI ESG score on the performance of a fund is stronger for labelled funds* – should be rejected based on the results above. The fourth hypothesis - *the effect of the MSCI Impact score on the performance of a fund is stronger for labelled funds* – can be accepted based on the results above.

In the third regression, the interaction terms for the presence of the FNG label (0=no, 1=if yes) was added, involving again both the ESG Score and the Impact Score. Again, including these interaction terms leads to a small change in the ESG Score and Impact Score variables compared to previous regression, but the coefficients of the ESG Score and Impact Score remain approximately constant and as significant as they were. In this third regression model, the results of the control variables remain again completely the same as in the previous regression models. The R-squared of the model also again stays almost exactly the same in this second regression, which suggests that the interaction terms did not provide much additional explanatory value to the model.

The coefficient of the included first interaction term (Presence of the FNG label * ESG Score) is negative (-.170) and indicates significance at the 1% level. This indicates that the presence of the FNG label

negatively moderates the relationship between the ESG Scores and the Total Return NAV. The coefficient of the second interaction term (Presence of the FNG label * Impact Score) is .103, also indicating significance at the 1% level. This indicates that the presence of the FNG label positively moderates the relationship between the Impact Scores and the Total Return NAV.

These findings indicate that the presence of the FNG sustainable label moderates the relationship between the ESG Scores and the Total Return NAV and the Impact Score and the Total Return NAV. However, it is important to note here that the moderating effect is negative for the FNG label on the ESG score and positive for the FNG label on the Impact score. Therefore, the fifth hypothesis - *the effect of the MSCI ESG score on the performance of a fund is stronger for a FNG labelled fund* – should be rejected, based on the above results. The sixth hypothesis – *the effect of the MSCI Impact score on the performance of a fund is stronger for a FNG labelled fund* – can be accepted, based on the above results.

In the fourth regression, the interaction terms for the presence of the ISR label (0=no, 1=if yes) was added, involving again both the ESG Score and the Impact Score. Once again, this led to a small change in the ESG Score and Impact Score variables compared to previous regression, but the coefficients of the ESG Score and Impact Score remain approximately constant and as significant as they were. In this fourth regression model, the results of the control variables remain again completely the same as in the previous regression models. The R-squared of the model also again stays almost exactly the same in this second regression, which suggests that the interaction terms did not provide much additional explanatory value to the model.

The coefficient of the included first interaction term (Presence of the ISR label * ESG Score) is negative (-.055), but shows no significance. Therefore, the seventh hypothesis - *the effect of the MSCI ESG score on the performance of a fund is stronger for a ISR labelled fund* – should be rejected, based on the above results.

The coefficient of the second interaction term (Presence of the ISR label * Impact Score) is .104, also indicating significance at the 5% level. This indicates that the presence of the ISR label positively moderates the relationship between the Impact Scores and the Total Return NAV. Therefore, the eighth hypothesis – *the effect of the MSCI Impact score on the performance of a fund is stronger for a ISR labelled fund* – can be accepted, based on the above results. This indicates that the presence of the ISR sustainable label only moderates the relationship between the Impact Score and the Total Return NAV.

In the fifth regression, the interaction terms for the presence of both the FNG and the ISR label (0=no, 1=if yes) was added, involving again both the ESG Score and the Impact Score. Again, this led to a small change in the ESG Score and Impact Score variables compared to previous regression, but the coefficients of the ESG Score and Impact Score remain approximately constant and as significant as they were. In this fifth regression model, the results of the control variables remain again almost

completely the same as in the previous regression models. The R-squared of the model also again stays almost exactly the same in this second regression, which suggests that the interaction terms did not provide much additional explanatory value to the model.

The coefficient of the included first interaction term (Presence of both labels * ESG Score) is negative (-.782), indicating significance at the 1% level. This indicates that the presence of both labels negatively moderates the relationship between the Impact Scores and the Total Return NAV. The coefficient of the second interaction term (Presence of both labels * Impact Score) is .371, indicating significance at the 1% level. This indicates that the presence of both labels positively moderates the relationship between the Impact Scores and the Total Return NAV.

These findings indicate that the presence of the both sustainable labels moderates the relationship between the ESG Scores and the Total Return NAV and the Impact Score and the Total Return NAV. However, it is important to note here that the moderating effect is negative for the presence of both labels on the ESG Score and positive on the Impact Score. Therefore, the nineth hypothesis - *the effect of the MSCI ESG score on the performance of a fund is stronger for a fund labelled with both the FNG and the ISR label* – should be rejected, based on the above results. The tenth hypothesis – *the effect of the MSCI Impact score on the performance of a fund is stronger for a fund* labelled with both the FNG *and the ISR label*– can be accepted, based on the above results.

4.3. Hypothesis answering

To conclude, here again all hypotheses are listed together with their acceptance or rejection.

1. There is a significant positive relationship between the MSCI ESG score and the Performance of a fund (Total return NAV).
2. There is a significant positive relationship between the MSCI Impact score and the Performance of a fund (Total return NAV).

Both hypothesis are accepted, based on the results in this paper.

The following hypotheses are divided into groups of ‘any label’, ‘FNG label’, ‘ISR label’ and ‘both labels’:

Any label:

3. The effect of the MSCI ESG score on the performance of a fund is stronger for labelled funds.

This hypothesis is rejected, because the results suggest that the existence of any sustainable label is significantly negatively moderating the relationship between the MSCI ESG score and the performance of a fund.

4. The effect of the MSCI Impact score on the performance of a fund is stronger for labelled funds.

This hypothesis is accepted, because the results suggest that the existence of any sustainable label is significantly positively moderating the relationship between the MSCI Impact score and the performance of a fund.

FNG Label:

5. The effect of the MSCI ESG score on the performance of a fund is stronger for a FNG labelled fund.

This hypothesis is rejected, because the results suggest that the existence of an FNG label is significantly negatively moderating the relationship between the MSCI ESG score and the performance of a fund.

6. The effect of the MSCI Impact score on the performance of a fund is stronger for a FNG labelled fund.

This hypothesis is accepted, because the results suggest that the existence of an FNG label is significantly positively moderating the relationship between the MSCI Impact score and the performance of a fund.

ISR Label:

7. The effect of the MSCI ESG score on the performance of a fund is stronger for a ISR labelled fund.

The seventh hypothesis is rejected, because the coefficient is not statistically significant.

8. The effect of the MSCI Impact score on the performance of a fund is stronger for a ISR labelled fund.

This hypothesis is accepted, because the results suggest that the existence of an ISR label is significantly positively moderating the relationship between the MSCI Impact score and the performance of a fund.

Both labels:

9. The effect of the MSCI ESG score on the performance of a fund is stronger for a fund labelled by both the FNG and ISR label.

The ninth hypothesis is rejected because the results suggest that the existence of both labels is significantly negatively moderating the relationship between the MSCI ESG score and the performance of a fund.

10. The effect of the MSCI Impact score on the performance of a fund is stronger for a fund labelled by both the FNG and ISR label.

The last hypothesis is accepted because the results suggest that the existence of both labels is significantly positively moderating the relationship between the MSCI Impact score and the performance of a fund.

5. Discussion

It is important to acknowledge the limitations of this study. The most important limitation of this study is the fund-data availability. This thesis drew from public data sources, which limited the amount of available data. This limitation was the reason that no more control variables were added in the regressions of the statistical analysis, for example expense ratio and turnover ratio or market conditions. The lack of data-availability has also influenced the reliability of the control variables that were added. The logAUM and the percentage change in Fund flows are both computed with a limited dataset where consecutive data was not available for each fund per month, which may make these control variables less valuable/reliable. The data constraint is also the reason why Fund Flows have not been used normalized, although this corrects for funds size and ensures that funds of different sizes can be compared better. Including more control variables would have substantially reduced the sample size, potentially compromising the robustness of the study. Therefore, only two control variables were included in this study.

The relatively small amount of observations results in relatively high standard errors for the coefficients of the independent variables, this could be remedied by conducting research over a longer period of time, increasing the number of data points.

Changes have been made in this study with regard to the research proposal for this thesis. This is due to the fact that after extensive statistical analysis it turned out to be problematic to compare sustainable scores and sustainable labels at the same level due to the nature of these variables. After rewriting the sub-questions , re-drafting the hypotheses and adjusting the methodology, the same main question could be answered as proposed in the research proposal.

As mentioned in the introduction of this paper, addressing the research question as suggested valuable follow-up research in the study of Ramos et al. (2022), could potentially serve to persuade investors to attribute greater value to sustainable fund labels, shift from unsustainable investments to sustainable investments and thereby advancing progress towards achieving the climate objectives outlined in the Paris Agreement and the Sustainable Development Goals (SDGs). In the field of sustainable scores of funds and their performance, the results of this research are in line with the research already conducted in this area, but in the field of sustainable labels and funds' performance and the moderating effect on sustainable scores and the funds' performance, the result is not in line with what had already been researched. The results and conclusions drawn in this paper do not show a convincing, reliable picture of sustainable labels in combination with sustainable scores as credible informational cues. It calls into question the role of these sustainable labels as efficient tool for investors in their search for reliable sustainable indicators.

Therefore, valuable follow-up research is to investigate the impact of different sustainable labels directly compared to the impact of different sustainable scores on the performance of a fund. This kind of research could provide new insights in the role of sustainable labels as efficient tool for investors. Another possible follow-up study to this thesis could be whether the same hypotheses hold for the Morningstar ESG score and whether moderated with other sustainable labels in Europe. This can be used to investigate whether the results found in this research also apply to the sustainability scores of other data providers and other European fund labels. This is way of verifying the findings of this study in a broader context.

6. Conclusion

The research question central to this research paper is: which sustainable signals have the most impact on equity funds performance in Europe? To answer the main research question, two sub questions are formulated:

1. What is the relation between the sustainable score and a fund's performance?
2. Is this relationship moderated if the fund is labelled by the FNG and/or ISR?

The first sub question can be answered based on the first two hypotheses, which are both accepted in this paper. There is positive significant relationship found between the sustainable score, the MSCI ESG score or MSCI Impact score, and a fund's performance.

The second sub-question builds on eight different hypotheses. The hypotheses examining the consequences of having any-label are both accepted in this study, so we can conclude that the relationship between the MSCI ESG or MSCI Impact score are moderated by the existence of any label.

The hypotheses examining the consequences of a fund being labelled by the FNG are partly rejected and partly accepted. This results suggest that the existence of an FNG label is significantly (negatively) moderating the relationship between the MSCI ESG score and the performance of a fund, but significantly (positively) moderating the relationship between the MSCI Impact score and the performance of a fund.

The hypotheses examining the consequences of a fund being labelled by the ISR are also partly rejected and partly accepted. This results suggest that the existence of an ISR label is not significantly moderating the relationship between the MSCI ESG score and the performance of a fund, but is significantly (positively) moderating the relationship between the MSCI Impact score and the performance of a fund.

The two hypotheses examining the consequences of a fund being labelled by both the FNG and ISR are also partly rejected and partly accepted. This results suggest that the existence of both the FNG and ISR label is significantly (negatively) moderating the relationship between the MSCI ESG score and the performance of a fund and is significantly (positively) moderating the relationship between the MSCI Impact score and the performance of a fund.

Based on these findings, the second sub-question can be answered. The relationship between the sustainable score and a fund's performance is moderated if the fund is labelled by the FNG and/or ISR, with the only exception to this conclusion being the non-significant outcome of the ISR label in the case of the MSCI ESG score. In a number of cases the hypothesis of significant positively moderating a relationship was rejected, but in all these cases there was a negatively moderating relationship.

By answering the two sub-questions of this paper, an answer can also be formulated to the main research question. From the moderating variables in which the Impact score occurs, we can conclude that the MSCI Impact score in all cases has a considerable smaller impact on the performance of an equity fund in Europe, compared to the MSCI ESG score. From the moderating variables it can also be concluded that the impact of this MSCI Impact score increased significantly, but slightly if the fund was labelled by both or any of the FNG and ISR label.

Comparing the significant coefficients of the sustainable scores and moderating variables in the different regressions, it can be concluded that the MSCI ESG score, as sustainable signal, has the most impact on the performance of equity funds in Europe, when the fund isn't labelled by any sustainable label. Contrary to the Impact score, the impact of the ESG score on the performance is decreasing when it is combined with any label or both.

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