Is There a Sustainability Premium for Funds? An Analysis of Fees, Returns and Sustainability

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Independent project • 15 credits
Swedish University of Agricultural Sciences, SLU
Faculty of Natural Resources and Agricultural Sciences/Department of Economics
Political Science – Sustainable Development
Degree project/SLU, Department of Economics, 1680 • ISSN 1401-4084
Uppsala 2025

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Credits:	15 credits
Level:	First cycle, G2E
Course title:	Independent project in Economics
Course code:	EX0903
Programme/education:	Political Science – Sustainable Development
Course coordinating dept:	Department of Economics
Place of publication:	Uppsala
Year of publication:	2025
Copyright:	All featured images are used with permission from the copyright owner.
Title of series:	Degree project/SLU, Department of Economics
Part number:	1680
ISSN:	1401-4084

Keywords:	Sustainability, Fund Fees, Fund Returns

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Abstract

This study investigates whether sustainable funds exhibit significantly different fees and returns compared to their unsustainable counterparts, and whether a "sustainability premium" can be identified. Employing regression analysis, the research examines the relationship between sustainability and fund fees, as well as sustainability and fund returns. The results show that the sustainability variable had no significant impact on fund fees. However, the regression analysis of fund returns presents mixed results. In two out of three models the sustainability variable had a statistically significant impact on funds three-year returns but it is important to know that all models are deemed relatively unreliable. However, the results of this study do not provide clear support for the existence of a "sustainability premium". The absence of significant differences in fees and the mixed findings concerning returns suggest that investors are not consistently paying a premium for sustainable funds. The study identifies several limitations, including reliance on data from specific platforms, small sample size, short time horizon and potential non-linear relationships between variables. Future research should explore alternative methodologies when investigating the impact of sustainability on fund performance, using different time horizons and larger sample sizes while taking into account non-linear relationships between variables.

Keywords: Sustainability, Fund Fees, Fund Returns

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Abbreviations

SFDR	Sustainable Finace Disclosure Regulation
SRI	Socially Responsible Investment
ESG	Environmental Social Governance
MLR	Multiple Linear Regression
MSEK	Millions Swedish Crowns
AIC	Akaike Information Criterion
BIC	Bayesian Information Criterion

1. Introduction

In recent years, sustainable investing has surged in popularity, reflecting a growing global awareness of environmental and social challenges (Gonçalves et al., 2021). Investors are increasingly integrating environmental, social, and governance factors into their investment strategies, seeking not only competitive financial returns but also a positive contribution to society and the environment (Ielasi & Rossolini, 2019). This trend has fueled the expansion of sustainable investment funds, particularly those classified under Article 9 of the Sustainable Finance Disclosure Regulation (SFDR), which are explicitly dedicated to sustainable investments (Article 6, 8 and 9 Funds, 2025)

The SFDR aims to increase transparency and combat greenwashing by clarifying the definition of a 'sustainable fund'. The SFDR classifies funds as either article 6, 8 or 9 funds. The Article 9 classified funds represent the highest standard of sustainable investing, requiring a clear commitment to sustainable objectives. Article 9 funds are officially defined as funds that have sustainable investment as their objective (Article 6, 8 and 9 Funds, 2025). Article 9 funds are used as the "sustainable" funds in this paper. As investors pour capital into these funds, it is crucial to examine their financial performance and cost structures (Ielasi & Rossolini, 2019).

However, the financial implications of sustainable investing remain a subject of debate. Due to contradicting studies there is no clear answer in the debate regarding if sustainable funds are better or worse regarding returns and fees compared to other funds. These inconsistencies underscore the need for further research to clarify the financial implications of sustainability. Investigating this is not only academically compelling but also critically important for guiding investors, informing policy, and aligning market behavior with broader environmental and social objectives. A clear understanding of the potential monetary costs investors could face by investing sustainably could significantly shape the future of responsible investing. Thus, the research questions in this thesis is:

Are sustainable funds cheaper or more expensive in terms of fees compared to other funds? Do sustainable funds deliver higher or lower returns compared to other funds? Based on the answers to the previous questions, can a "sustainability premium" be identified?

This thesis aims to provide further insights into the debate by empirically investigating the fees and returns of Article 9 funds compared to their

unsustainable counterparts, the funds that aren’t classified as article 9 funds. By analyzing a sample of funds and employing multiple-linear regressions, while controlling for fund category and other relevant variables, the thesis seeks to determine whether a "sustainability premium", exists in the context of Article 9 funds. A potential sustainability premium suggests an additional cost investors make in order to invest in sustainable funds. The findings will contribute to a better understanding of the financial characteristics of sustainable investing, helping investors and stakeholders make informed decisions about allocating capital to sustainable investments.

2. Literature review

Investors are increasingly drawn to sustainable funds for a variety of reasons, reflecting a shift from purely financial considerations to incorporating values and ethics (Bauer & Derwall, 2011; Koellner et al., 2005). Sustainable investing has transitioned from a niche market to a mainstream approach, propelled by heightened awareness of environmental issues, social inequality, and governance failures (Camilleri, 2020; Gonçalves et al., 2021). Many seek to align their investments with their personal beliefs regarding environmental protection, social justice, and good governance (Bauer & Derwall, 2011). Early forms of socially responsible investing often involved negative screening, excluding companies involved in controversial activities (Camilleri, 2020). However, the field has broadened to include positive screening, ESG integration, impact investing, and thematic investing (Groot & Nijhof, 2015). Furthermore, some investors believe that sustainable companies are better positioned for long-term financial success due to the resilience, innovation, and risk management practices as well as them being ever more relevant to us as climate change becomes an increasingly larger issue (Jansson & Biel, 2011).

The Sustainable Finance Disclosure Regulation has emerged as a key regulatory framework in the European Union, designed to enhance transparency and combat greenwashing in the financial industry (Article 6, 8 and 9 Funds, 2025). In this paper, article 9 is used to define sustainability. Article 9 of SFDR specifically defines funds that have sustainable investment as their objective (Article 6, 8 and 9 Funds, 2025). These "dark green" funds represent the highest standard of sustainable investing, with a clear commitment to measurable, positive impact (Sustainable Finance Disclosure Regulation - Article 9 Funds or “Dark Green Funds,” 2023).

The academic literature presents mixed evidence on the financial performance of sustainable funds compared to conventional funds. Some argue that companies with strong sustainability practices exhibit better operational performance and ultimately generate higher cash flows (Clark et al., 2014). This perspective suggests that sustainable funds should, in theory, deliver competitive, if not superior, returns. Saci et al. (2022) found that socially responsible investment (SRI) funds in China outperformed traditional funds during market downturns, highlighting lower volatility as a key factor. Conversely, Christensson & Skagestad (2017) observed underperformance in sustainable funds in emerging markets, attributing it to more conservative investment strategies. This would support the existence of a sustainability premium. A meta-analysis by Rathner (2013) concluded that the performance differences between sustainable and

conventional funds are not statistically significant when averaged across studies. Santomil et al., (2019) also found no significant difference in performance between SRI and conventional funds.

Regarding specifically sustainable funds fees, there is still little research. Cheraghi & Sundqvist (2022) reported that sustainable funds often charge higher expense ratios, possibly due to the cost of ESG integration and certification. This would support the existence of a sustainability premium. However, Leppänen (2024) found only marginal fee differences between sustainable and conventional funds, challenging the notion of a significant “sustainability cost”. Traditional active funds seems to often charge higher fees to outperform the market (Gonçalves et al., 2021). The fund fees could also have an impact on the demand for the fund, which could impact investment opportunities and strategies that determine the returns for the fund. One study (Scheitza & Busch, 2024) found that impact-related funds have higher management fees. However, another study (Gil-Bazo et al., 2009) found no significant differences in fees between SRI and conventional funds, except in the case where SRI funds were cheaper than conventional funds run by the same management company.

In conclusion, sustainable investing has evolved significantly, driven by increased awareness of environmental and social issues. While the SFDR provides a framework for transparency, academic research presents mixed evidence regarding the financial performance of sustainable funds compared to conventional ones. Some studies suggest that sustainable practices can lead to better operational and investment performance, while others find no significant difference or even underperformance. Similarly, the debate continues regarding fees, with some research indicating higher costs for sustainable funds and other studies disputing this notion. Ultimately, the question of whether investors face a "sustainability premium" remains a subject of ongoing investigation. This paper contributes to the debate and takes part in filling a research gap as there are few studies that specifically try to identify a sustainability premium for funds. Additionally, this paper also contributes to the ongoing debate if sustainable funds deliver higher or lower returns compared to their counterparts.

3. Methodology and data

3.1 Method

In order to find a sustainability-premium for sustainable funds, six multiple-linear regressions are estimated. Three regressions are for estimating the funds fees and three regressions are for estimating the funds three year returns. The first regressions consist of the most essential variables based on previous academic research, then the regressions gradually increase in relevant control variables. This is in order to avoid overfitting and make more reliable models that shows true underlying variable-relationships. Only the most reliable models are thoroughly analysed. To identify which of the models are the most reliable, the models are compared by their AIC and BIC values. Along with the regressions, descriptive statistics are also shown. There are in total 60 observations that concist of 30 sustainable funds and 30 unsustainable funds. The analysis is cross-sectional. All data, regressions and analysis was made using Microsoft-Excel. Multiple linear regression (MLR) was selected for this study due to its straightforward application and interpretability. It is a suitable method when analyzing the relationship between one dependent variable and multiple independent variables. MLR allows researchers to quantify how much variation in the dependent variable can be explained by the combined effect of the independent variables. Additionally, MLR produces estimated coefficients, standard errors, t-values, and p-values for each independent variable. These statistical outputs help assess the reliability of the model and indicate whether the independent variable has a statistically significant effect on the dependent variable.

Three of the multiple linear regressions estimate the effect of sustainability on funds fees with the goal to see if the sustainability variable has a statistically significant impact on fund fees. If sustainable funds charge higher fees, then this can be interpreted as a potential cost of sustainability. The other three multiple linear regression estimates the funds three-year returns. Here the goal is to once again see if the sustainability variable has a significant impact on a funds returns. If sustainable funds deliver generally lower returns then this can be interpreted as a potential cost of sustainability. If they deliver generally higher returns then it can be interpreted as additional profit by investing sustainably.

3.2 Data Selection and Sampling

The study began by selecting all Article 9 (sustainable) funds listed on Nordnet and Avanza that were classified by thematic categories, such as industry sector (e.g., technology, healthcare) or geographic region (e.g., Europe, North America). A minimum threshold of ten years of return data was initially set to ensure the inclusion of funds with a reliable and representative performance history. However, due to limitations in verifying the consistency of sustainability classification over the entire ten-year period, the analysis ultimately employed three-year return data for all selected funds. This ensures that only funds are included that were consistently categorized as sustainable between April 2022 to April 2025. In total, 30 sustainable funds met the inclusion criteria and were selected for the sample.

To construct a comparable reference group, the study identified non-sustainable funds with similar categories. A total of 16 non-sustainable funds were found that matched the sustainable funds in terms of category and return data availability. The remaining 14 non-sustainable funds were selected through a random sampling process, using a random number generator applied to a list of over 1,000 funds. All data that was used is from mid-april 2025 and as said earlier the three-year returns cover the period between April 2022 to April 2025.

3.3 Descriptions & Definitions of Variables

The following variables are used in the econometric models.

- Dependent variables: Three-year return & Fee (depending on which regression)
- Independent variable: Sustainability-dummy variable.
- Control variables: Three-year return & Fee (depending on which regression), Category, Fund Size MSEK, Currency, Distribution, Geographic Focus, Start Year of Fund, Investors Nordnet, Investors Avanza, Index, Risk.

Three-year return. This is one of the dependent variables as well as a control variable depending on the regression. It is measured in percentage. It is used as a dependent variable in order to see if the sustainability variable has a significant impact on a funds returns. If sustainable funds deliver generally lower returns then this can be interpreted as a potential extra cost of sustainability, helping in identifying a sustainability premium for funds. Three-year returns were used because article 9 was introduced in 2021, making returns before 2021 unreliable for this thesis. It is used as a control variable because returns can influence the perceived value of a fund. Higher-performing funds may justify higher fees due to

perceived skill or access to better opportunities. In the context of sustainability, if sustainable funds yield lower returns, this can imply a "sustainability cost" (Guasoni, Wang, 2012).

Fee. This is also one of the dependent variables as well as a control variable depending on the regression. It is measured in percentage. A funds fee is one of the most important factors for this thesis. For many investors, the funds fee is a proxy for the price of the fund. If the aim is to identify a sustainability-premium, then the price is the clearest way to see if there are differences in the "cost" of sustainable funds compared to unsustainable funds. It is also used as a control variable in the regression for returns. Because fund fees serve as a proxy for fund pricing, they also in turn affect the demand for the fund. High fees can reduce net returns and influence fund selection by investors, thereby impacting fund flows and available capital for investment strategies which can have implications on return potential (Escobar-Anel et. al., 2023).

Sustainability-dummy. This is the independent variable. It is a dummy variable and is only measured in the data as either 0 or 1. If the dummy variable is active, 1, then it means that the fund is sustainable. This is the most important variable in the thesis and the variable that is most focused on. The aim is to see, when the sustainable variable is active, if the fees or the returns for the funds are impacted in a significant way. The definition for sustainable is if the fund is classified as an article 9 fund. Article 9 funds are defined as funds that have sustainable investment as their objective. It is the highest standard of sustainable investment with a clear commitment to measurable, positive impact.

Category. This is a control variable. Fund category (e.g., sectoral, thematic, regional) inherently determines the risk-return profile and management approach. Including it as a control variable accounts for variability in performance and fee structures across fund types (Desai, et. al., 2023). As there are many ways to categorize funds, this thesis have been limited to seven broad categories. This is because when there are too many categories and very few observations for each category, there is too little data to make reliable statistics. As this is a categorical variable, each category has to be used as a dummy variable in order to make a regression. For example, if the dummy variable "Technology focus" is active for a fund then the fund has a technological focus. The reference variable here is "Funds that invest in bonds". The reference variable was chosen because it had the least amount of observations, thus is the least important for the model. No fund is part of two or more categories. The following are the categories:

- Environmental focus. Consists of funds that are classified as agricultural, climate and water funds.

- Technology focus. Constists of funds that are classified as biotech and tech funds.
- Growth focus. Consists of funds that are classified as growth and emerging markets funds.
- Geographic focus. Consists of funds that are classified as solely USA, Japan or Nordic focused funds
- Company size focus. Consists of funds that are classified as small sized company and medium sized company focused funds.
- Energy focus. Consists of funds that solely focus on energy.
- Other. Consists of value funds, pharmaceutical funds, consumer funds and real-estate funds. These are considered "other" because they couldn't fit the established categories and had too few observations on their own. For this regression it would give more reliable results if they all are part of the same category to give them collectively enough observations to be reliably measured.

Fund Size MSEK. This is a control variable. This variable is considered a proxy for demand for the funds. Demand is an important factor to control for as an increase in demand has been shown to lead to an increase in prices (fees) and also increase the amount of assets that the fund manages which in turn can impact the funds returns (Hitzemann, et. al., 2022) .

Investors Nordnet. This is also a control variable used as a proxy for demand.

Investors Avanza. This is also a control variable used as a proxy for demand.

Currency. This is a control variable. As this is a categorical variable, it concists of several dummy variables in order to use it in the regressions. These dummy variables are: SEK, EUR and USD. The reference variable here is "JPY" which is the Japanese currency. The reference variable was chosen because it had the least amount of observations, thus is the least important for the model. What currency that the fund is traded in is an important factor to control for. Funds that are traded in appreciating currencies can have higher returns while funds that are traded in depreciating currency can have lower returns (Wise, 2024).

Distribution. This is a control variable. This is a dummy variable. If the dummy is active (=1) then the fund gives out dividends. The distribution policy can affect the returns of the fund, especially in the long term. The distribution policy determines how much dividends the fund will give to its investors, if any at all. In other words, how much of the total profit the fund shares with its investors (Abraham, 2024).

Geographic Focus. This is a control variable. This is also a series of dummy variables because this is a categorical variable. The reference variables here are "Sweden" and "Japan". The reference variables were chosen because they had the least amount of observations, thus are the least important for the model. There are four different dummy variables that measure the geographic exposure of the fund. These dummy variables are: Global, Europe, USA and Asia. It was chosen that if a fund has over 60% of its assets in a specific region that it would be considered to have a geographic focus on the region. The geographic focus of a fund can impact the funds risk and return. If a fund is focusing solely on a single country or region then it can offer high growth potential while at the same time exposing the fund to a higher risk (Trustnet, 2024).

Start Year of Fund. Control variable. The age of the fund can have an affect on returns and fees. According to previous research, older funds typically have lower fees and younger funds can have higher returns while having more risk (Sha, Yi, 2024; Su, Hu, 2024).

Index. Control variable. This is a dummy variable. If the dummy is active (=1) then the fund is an index fund. Because of the passive management style, index funds have lower management fees, giving lower overall fees for investors. They often invest broadly and have diverse investments, reducing the investment risk (Hayes, 2025).

Risk. Control variable. In investment, there is a risk-return tradeoff principle. According to Investopedia, it states that "the potential return rises with an increase in risk. Using this principle, individuals associate low levels of uncertainty with low potential returns, and high levels of uncertainty or risk with high potential returns". This is a very important variable to control for as it is central for the funds performance. Additionally, previous research has found that higher fees are associated with increased risk aversion (Braun, et. al., 2024). Risk is measured on a scale of 1-7, Here, risk refers to how much the fund's value has historically fluctuated. According to morningstar.se (2021) the EU decided ten years ago that information about risk must be included in the fund's fact sheet, and summarized on a scale from 1 to 7, called "Risk / return profile" where 1 means lowest risk and 7 means highest risk. The scale is based on the fluctuations in the fund's historical returns over the past 5 years, as measured by the standard deviation of weekly returns. If the fund has existed for a shorter time, the comparison index is used (Greiner, 2021).

3.4 Econometric Models

These are the econometric model equations for the three regressions regarding fund fees:

$$Fee_i = \beta_0 + \beta_1 Sustainable_i + \beta_2 FundSize_i + \beta_3 Age_i + \beta_4 Index_i + \varepsilon_i$$

$$Fee_i = \beta_0 + \beta_1 Sustainable_i + \beta_2 FundSize_i + \beta_3 Age_i + \beta_4 Index_i + \beta_5 Return3_i + \beta_6 Risk_i + \beta_7 EnvironmentalFocus_i + \beta_8 TechnologyFocus_i + \beta_9 GrowthFocus_i + \beta_{10} GeographicFocus_i + \beta_{11} CompanySizeFocus_i + \beta_{12} Energy_i + \beta_{13} Other_i + \varepsilon_i$$

$$Fee_i = \beta_0 + \beta_1 Sustainable_i + \beta_2 FundSize_i + \beta_3 Age_i + \beta_4 Index_i + \beta_5 Return3_i + \beta_6 Risk_i + \beta_7 EnvironmentalFocus_i + \beta_8 TechnologyFocus_i + \beta_9 GrowthFocus_i + \beta_{10} GeographicFocus_i + \beta_{11} CompanySizeFocus_i + \beta_{12} Energy_i + \beta_{13} Other_i + \beta_{14} InvestorsNordnet_i + \beta_{15} InvestorsAvanza_i + \varepsilon_i$$

These are the econometric model equations for the three regressions regarding funds three-year returns:

$$Return3_i = \beta_0 + \beta_1 Sustainable_i + \beta_2 Fee_i + \beta_3 Risk_i + \beta_4 EnvironmentalFocus_i + \beta_5 TechnologyFocus_i + \beta_6 GrowthFocus_i + \beta_7 GeographicFocus_i + \beta_8 CompanySizeFocus_i + \beta_9 Energy_i + \beta_{10} Other_i + \varepsilon_i$$

$$Return3_i = \beta_0 + \beta_1 Sustainable_i + \beta_2 Fee_i + \beta_3 Risk_i + \beta_4 EnvironmentalFocus_i + \beta_5 TechnologyFocus_i + \beta_6 GrowthFocus_i + \beta_7 GeographicFocus_i + \beta_8 CompanySizeFocus_i + \beta_9 Energy_i + \beta_{10} Other_i + \beta_{11} FundSize_i + \beta_{12} Distribution_i + \beta_{13} Age_i + \beta_{14} Index_i + \varepsilon_i$$

$$Return3_i = \beta_0 + \beta_1 Sustainable_i + \beta_2 Fee_i + \beta_3 Risk_i + \beta_4 EnvironmentalFocus_i + \beta_5 TechnologyFocus_i + \beta_6 GrowthFocus_i + \beta_7 GeographicFocus_i + \beta_8 CompanySizeFocus_i + \beta_9 Energy_i + \beta_{10} Other_i + \beta_{11} FundSize_i + \beta_{12} Distribution_i + \beta_{13} Age_i + \beta_{14} Index_i + \beta_{15} InvestorsNordnet_i + \beta_{16} InvestorsAvanza_i + \beta_{17} SEK_i + \beta_{18} EUR_i + \beta_{19} USD_i + \beta_{20} Global_i + \beta_{21} Europe_i + \beta_{22} USA_i + \beta_{23} Asia_i + \varepsilon_i$$

Each observation of i is a fund.

3.5 Data Sources

Table 1. Data Sources.

Variable	Variable Type	Data Source
Fee	Dependent, independent, quantitative	Nordnet & Avanza, 2025
Return3	Dependent, independent, quantitative	Nordnet & Avanza, 2025
Sustainable	Independent, qualitative, dummy	Nordnet & Avanza, 2025
Category	Control, qualitative, several dummy variables	Nordnet & Avanza, 2025
Fund Size MSEK	Control, quantitative	Nordnet, Avanza & Dagens industry, 2025
Currency	Control, qualitative, several dummy variables	Nordnet & Avanza, 2025
Distribution	Control, qualitative, dummy	Nordnet & Avanza, 2025
Geographic Focus	Control, qualitative, several dummy variables	Nordnet & Avanza, 2025
Age of Fund	Control, quantitative	Nordnet, Avanza & Morningstar, 2025
Investors Nordnet	Control, quantitative	Nordnet, 2025
Investors Avanza	Control, quantitative	Avanza, 2025
Index	Control, qualitative, dummy	Nordnet & Avanza, 2025
Risk	Control, quantitative, scale of 1-7	Nordnet & Avanza, 2025

4. Results

This section presents the findings from the multiple linear regressions conducted to investigate the relationship between sustainability and fund performance, specifically focusing on fund fees and three-year returns. Six regressions were performed in total; three estimating fund fees and three estimating three-year returns.

4.1 Descriptive Statistics

Table 2. Descriptive Statistics.

Variables	Mean	Median	SD	Variance
Returns3	0,071	0,067	0,191	0,037
Sustainable	0,500	0,500	0,504	0,254
Fee	0,018	0,019	0,006	0,001
Risk	4,467	4,000	0,812	0,660
Environmental focus	0,217	0	0,415	0,173
Technology focus	0,067	0	0,252	0,063
Growth focus	0,117	0	0,324	0,105
Geographic focus	0,067	0	0,252	0,063
Company size focus	0,133	0	0,343	0,118
Energy	0,167	0	0,376	0,141
Other	0,183	0	0,390	0,152
Fund Size MSEK	15765	5679	25356,164	642935074,441
Dividends	0,017	0	0,129	0,017
Age of Fund	20,200	18	7,175	51,485
Index	0,050	0	0,220	0,048
Investors Nordnet	1171,683	465,500	1874,799	3514871,745
Investors Avanza	5551,133	696	13822,02	191048247,982
SEK	0,333	0	0,475	0,226
EUR	0,267	0	0,446	0,199
USD	0,390	0	0,492	0,242
Global	0,317	0	0,469	0,220
Europe	0,117	0	0,324	0,105
USA	0,433	0	0,500	0,250
Asia	0,083	0	0,279	0,078

The descriptive statistics provide a summary of the key variables in the fund dataset. The average three-year return is 7,1% with a notable standard deviation of 19,1%, indicating substantial variability in fund performance. Sustainable funds

make up half the sample. The average fund fee is 1,8%, with a standard deviation of 1,9%. The average risk level is 4,467. A lot of dummy variables are used. Regarding funds geographic focus, 43,3% of the funds has a geographic focus on USA and 11,7% of the funds has a geographic focus on Europe. The average fund size is 15,765 MSEK, with a large standard deviation (25356,164 MSEK) due to some very large funds. The average fund age is 20,2 years, showing that on average, the funds are relatively old. These descriptive statistics lay the groundwork for further analysis.

4.2 Regression Results for Fee

Table 3 presents the results of the first regression model, which examines the impact of sustainability on fund fees, controlling for fund size, age of fund and index funds.

Table 3. Fund Fee Regression 1.

Variables	Estimate	SE	Robust SE	T-stat	P-value
Intercept	-0,057	0,070	0,076	-0,816	0,418
Sustainable	-0,022	0,040	0,027	-0,552	0,583
Fund Size MSEK	0,001	0,001	0,001	-0,565	0,575
Age of Fund	0,006	0,003	0,006	1,934	0,058*
Index	0,012	0,092	0,029	0,134	0,894
Regression Summary					
Adj. R^2 = 0,017	F stat. = 1,248	P-value for F = 0,301	AIC = -221,66	BIC = -211,19	

Variable significant at *p<0,1, **p<0,05, ***p<0,01. The dependent variable is Fee.

The coefficient of the independent variable is -0,022. To interpret this, if a fund is sustainable then the model estimates that the fund fee will be around 0,02% lower. This would mean that sustainable funds are cheaper in terms of fund fees. The p-value of the sustainable variable is 0,583 which shows that it is not statistically significant. The adjusted R-squared is very low, most of the variation in fund fees is not captured by the variables. The F-statistic is also very low together with a high p-value for F, meaning that the model is not statistically significant. AIC and BIC will be compared with the other models later on.

Table 4 presents the results of the second regression model for fund fees, which includes additional control variables fund return and risk.

Table 4. Fund Fee Regression 2.

Variables	Estimate	SE	Robust SE	T-stat	P-value
Intercept	-0,025	0,134	0,105	-0,185	0,854
Sustainable	-0,008	0,047	0,024	-0,181	0,858
Fund Size MSEK	0,001	0,001	0,001	0,363	0,718
Age of Fund	0,007	0,003	0,006	2,104	0,041**
Index	0,007	0,092	0,031	0,073	0,942
Return3	-0,052	0,114	0,099	-0,452	0,653
Risk	-0,034	0,030	0,035	-1,152	0,255
Environmental focus	0,060	0,091	0,072	0,664	0,510
Technology focus	0,069	0,098	0,068	0,700	0,488
Growth focus	0,065	0,095	0,069	0,681	0,499
Geographic focus	0,337	0,104	0,310	3,237	0,002***
Company size focus	0,113	0,099	0,104	1,149	0,257
Energy	0,094	0,106	0,096	0,887	0,380
Other	0,014	0,082	0,052	0,175	0,862
Regression Summary					
Adj. R^2 = 0,126	F stat. = 1,653	P-value for F = 0,105	AIC = -221,54	BIC = -192,22	

Variable significant at *p<0,1, **p<0,05, ***p<0,01. The dependent variable is Fee.

The sustainable variable is still statistically insignificant with a negative coefficient. The adjusted R-squared has increased, while still not very high, it suggest that the model explains more of the variation in fees, this is due to the additional control variables. The F-statistic has also increased but is still very low, the p-value for F has dropped significantly but is still too high which suggests that the model is not statistically significant. These results would show an improvement in the model but still, the reliability of the model has slightly worsened with the added control variables as the AIC and BIC values have increased.

Table 5 presents the results of the third regression model for fund fees, with the full set of control variables.

Table 5. Fund Fee Regression 3.

Variables	Estimate	SE	Robust SE	T-stat	P-value
Intercept	-0,040	0,139	0,116	-0,290	0,773
Sustainable	-0,009	0,048	0,024	-0,199	0,843
Fund Size MSEK	0,001	0,001	0,001	0,536	0,595
Age of Fund	0,007	0,003	0,007	2,132	0,039**
Index	0,021	0,118	0,040	0,175	0,862
Return3	-0,051	0,117	0,099	-0,433	0,667
Risk	-0,032	0,030	0,034	-1,051	0,299
Environmental focus	0,059	0,093	0,071	0,637	0,527
Technology focus	0,068	0,101	0,068	0,675	0,503
Growth focus	0,060	0,098	0,066	0,612	0,544
Geographic focus	0,334	0,106	0,307	3,150	0,003***
Company size focus	0,118	0,101	0,107	1,169	0,249
Energy	0,101	0,110	0,099	0,922	0,362
Other	0,017	0,085	0,053	0,199	0,843
Investors Nordnet	0,001	0,001	0,001	-0,537	0,594
Investors Avanza	0,001	0,001	0,001	0,361	0,720
Regression Summary					
Adj. R^2 = 0,092	F stat. = 1,398	P-value for F = 0,191	AIC = -218,08	BIC = -184,58	

Variable significant at *p<0,1, **p<0,05, ***p<0,01. The dependent variable is Fee.

The sustainable variable is still negative and statistically insignificant. With even more control variables added the model became slightly less reliable. The adjusted R-squared is lower than the second model suggesting that the additional control variables did not help the model explain more variation, they rather reduced the explanatory power of the model. The F-statistic is also slightly lower together with a higher p-value for F compared to the second model which means that the model is still not statistically significant. Both AIC and BIC have increased, indicating that the model fit has worsened compared to earlier models. AIC and BIC penalize for adding variables, and since the adjusted R-squared also fell, this suggests that the new control variables did not meaningfully improve the model.

To summarize the findings across all three models for fund fees, the sustainability variable has consistently not been statistically significant and the coefficient remained relatively stable across the models. Based on these regressions you can conclude that there is no statistically significant relationship between the sustainability of funds and fund fees, the models are however unreliable.

4.3 Regression Results for Three-year Return

Table 6 presents the results of the first regression model, which examines the impact of sustainability on three-year fund returns, controlling for fund fee, risk and the category of fund.

Table 6. Three-year Return Regression 1.

Variables	Estimate	SE	Robust SE	T-stat	P-value
Intercept	0,130	0,152	0,153	0,853	0,398
Sustainable	-0,114	0,056	0,060	-2,026	0,048**
Fee	-0,074	0,182	0,158	-0,407	0,686
Risk	0,010	0,038	0,047	0,271	0,787
Environmental Focus	0,054	0,117	0,102	0,461	0,647
Technology Focus	-0,015	0,122	0,086	-0,125	0,901
Growth Focus	0,028	0,122	0,117	0,234	0,816
Geographic Focus	-0,046	0,147	0,186	-0,315	0,754
Company Size Focus	-0,063	0,117	0,104	-0,540	0,592
Energy	-0,192	0,132	0,135	-1,449	0,154
Other	-0,080	0,104	0,084	-0,772	0,444
Regression Summary					
Adj. R^2 = 0,069	F stat. = 1,438	P-value for F = 0,192	AIC = -193,16	BIC = -170,13	

Variable significant at *p<0,1, **p<0,05, ***p<0,01. The dependent variable is Three-year Return.

The coefficient of the independent variable is -0,114. To interpret this, if a fund is sustainable then the model estimates that the funds returns will be around 0,114% lower. This would mean that sustainable funds deliver lower returns for investors. The p-value of the sustainable variable is 0,048 which shows that it is statistically significant. The adjusted R-squared is low which suggests that the model explains very little of the variation. F statistic is very low, paired with a high p-value for F, which means that the model is not statistically significant. AIC and BIC will be compared with the other models later on.

Table 7 presents the results of the second regression model for three-year returns, which includes additional control variables fund size, dividends, age of fund and index fund.

Table 7. Three-year Return Regression 2.

Variables	Estimate	SE	Robust SE	T-stat	P-value
Intercept	0,063	0,174	0,183	0,363	0,718
Sustainable	-0,103	0,061	0,063	-1,683	0,099*
Fee	-0,085	0,192	0,140	-0,444	0,659
Risk	0,013	0,039	0,047	0,343	0,733
Environmental Focus	0,028	0,119	0,102	0,236	0,815
Technology Focus	-0,023	0,128	0,097	-0,178	0,859
Growth Focus	0,015	0,124	0,108	0,122	0,904
Geographic Focus	-0,027	0,150	0,188	-0,179	0,858
Company Size Focus	-0,056	0,134	0,114	-0,417	0,679
Energy	-0,195	0,136	0,135	-1,436	0,158
Other	-0,105	0,106	0,091	-0,990	0,327
Fund Size MSEK	0,0E-06	0,0E-06	0,0E-06	1,557	0,127
Dividends	0,044	0,207	0,089	0,213	0,832
Age of Fund	0,001	0,004	0,004	0,296	0,768
Index	0,093	0,120	0,102	0,772	0,444
Regression Summary					
Adj. R^2 = 0,054	F stat. = 1,242	P-value for F = 0,281	AIC = -189,12	BIC = -157,71	

Variable significant at *p<0,1, **p<0,05, ***p<0,01. The dependent variable is Three-year Return.

With the added control variables the significane of the sustainability variable has decrease but it is still significant with a p-value of 0,099. It is also still negative. The adjusted R-squared has decreased which means that adding the new control variables likely did not contribute meaningfully. The F statistic is lower than in the previous model and by looking at the p-value for F, again, the model is not statistically significant. Both AIC and BIC have increased slightly which shows a less reliable model.

Table 8 presents the results of the third regression model for three-year returns, with the full set of control variables.

Table 8. Three-year Return Regression 3.

Variables	Estimate	SE	Robust SE	T-stat	P-value
Intercept	0,438	0,379	0,436	1,154	0,256
Sustainable	-0,107	0,071	0,069	-1,507	0,141
Fee	0,283	0,279	0,322	1,013	0,318
Risk	0,056	0,050	0,069	1,109	0,275
Environmental focus	-0,018	0,134	0,143	-0,133	0,895
Technology focus	-0,013	0,138	0,124	-0,093	0,927
Growth focus	0,108	0,149	0,159	0,725	0,473
Geographic focus	-0,334	0,221	0,363	-1,511	0,140
Company size focus	-0,072	0,145	0,145	-0,498	0,622
Energy	-0,186	0,149	0,166	-1,245	0,222
Other	-0,085	0,118	0,132	-0,720	0,476
Fund Size MSEK	0,000	0,000	0,000	1,219	0,231
Dividends	0,083	0,229	0,131	0,364	0,718
Age of Fund	-0,003	0,006	0,006	-0,560	0,579
Index	0,233	0,181	0,166	1,288	0,206
Investors Nordnet	0,000	0,000	0,000	0,162	0,872
Investors Avanza	0,000	0,000	0,000	-0,559	0,580
SEK	-0,181	0,269	0,336	-0,673	0,505
EUR	-0,092	0,289	0,369	-0,317	0,753
USD	-0,236	0,281	0,345	-0,841	0,406
Global	-0,331	0,227	0,366	-1,460	0,153
Europe	-0,334	0,224	0,366	-1,493	0,144
USA	-0,265	0,215	0,373	-1,230	0,227
Asia	-0,430	0,245	0,373	-1,757	0,088*
Regression Summary					
Adj. R^2 = -0,008	F stat. = 0,952	P-value for F = 0,336	AIC = -180,78	BIC = -130,52	

Variable significant at *p<0,1, **p<0,05, ***p<0,01. The dependent variable is Three-year Return.

The sustainability variable is not statistically significant anymore. The adjusted R-squared has become negative with a value of -0,008, the model explains less than 0% of the variation in three-year fund returns, after adjusting for the number of predictors. This is likely due to having too many independent variables relative to the number of observations. The F statistic of 0,952 together with a high p-value for F shows that the model is not statistically significant. Both the AIC and BIC values have increased which means that the model fit have gotten worse.

To summarize the findings across all three models for fund returns, the sustainability variable has consistently had low p-values and in two models has been statistically significant. Its coefficient has remained relatively stable across the models. From these models one could make the argument that the relationship between the sustainability of a fund and its returns are negative. This would mean that if a fund is sustainable then it is expected that it would deliver lower returns compared to unsustainable funds. However, all models have been shown to be unreliable.

5. Discussion

This study aimed to investigate whether sustainable funds exhibit significant differences in fees and returns compared to their unsustainable counterparts, and whether a "sustainability premium" could be identified. The findings from the regression analyses provide some insights into these questions, although with certain caveats. When analysing and interpreting results, I choose to have a focus on table 3 (the first regression for fees) and table 6 (first regression for three-year returns) as they were the most reliable models when comparing AIC and BIC values between the models.

The first research question explored whether sustainable funds are cheaper or more expensive in terms of fees. Three regression models were constructed to estimate fund fees. In all three regressions, the coefficient for the "sustainable" variable was not statistically significant, Specifically, in the first regression which was the most reliable model, the coefficient of the sustainable variable was -0,022 with a p-value of 0,583. The second and third regressions, which included additional control variables, also yielded statistically insignificant coefficients for the sustainable variable. By examining the F-statistic and p-values for the F-test, no model is statistically significant. To interpret the results and answer the first research quesion, based on the sample and models used, there is no strong evidence to support the claim that sustainable funds are cheaper or more expensive in terms of fees.

The second research question examined whether sustainable funds deliver higher or lower returns compared to other funds. Three regression models were used to estimate three-year returns. In two out of the three regressions, the coefficient for the "sustainable" variable was statistically significant. Specifically, in the first regression model, which was the most reliable model, the coefficient of the sustainable variable was -0,114 with a p-value of 0,048. This indicates that sustainable funds had significantly lower returns compared to unsustainable funds in this model. In the second regression model, which included additional control variables, the sustainable variable was still statistically significant with a negative coefficient. However, in the third regression, the sustainable variable was not statistically significant. By examining the F-statistic and p-value for the F-test for the models, no model was shown to be statistically significant. Even though the models are not statistically significant, it is possible that the relationship between sustainability and three-year return still is statistically significant and that the control variables are dragging down the model. This suggests that, with weak mixed evidence, sustainable funds deliver lower returns compared to other funds.

It is important to remember however that these models are unreliable and there are several limitations that have to be taken into account when interpreting the results.

The third research question explored the possibility of identifying a "sustainability premium," meaning that due to the sustainable characteristic of the fund, the fund might deliver lower returns or make investors pay a more expensive fee as a form of additional cost of being sustainable. Based on the findings of this study, there is an argument that can be made that if investors want to invest sustainably, they have to be prepared to accept lower returns from their funds. Because of the reliability of the models and the mixed results from the regressions for returns, a stronger argument is that there is no clear evidence to support the existence of a sustainability premium. The lack of significant differences in fees and mixed results regarding returns, all from unreliable models, suggest that investors are not necessarily paying a premium for sustainable funds, nor are they consistently affected by lower returns.

When interpreting the results of this study, it's important to consider how they align with previous research. The finding that sustainability doesn't have a statistically significant impact on fund fees is not uncommon and aligns with Leppänens (2024) research that showed that there were only marginal differences between sustainable and conventional fund fees but there is still little research regarding specifically sustainable funds fees. This does not support the existence of a sustainability premium. However, the mixed results that showed that sustainable funds deliver lower returns resonate with some prior research, while contradicting others. Some studies have found a positive correlation between sustainability and financial performance, while others have found no correlation or even a negative correlation. Saci et al. (2022) found that socially responsible investment (SRI) funds in China outperformed traditional funds during market downturns, highlighting lower volatility as a key factor. Conversely, Christensson & Skagestad (2017) observed underperformance in sustainable funds in emerging markets, attributing it to more conservative investment strategies, which is more alike the results of this paper and also supports the existence of a sustainability premium. A meta-analysis by Rathner (2013) concluded that the performance differences between sustainable and conventional funds are not statistically significant when averaged across studies. Santomil et al., (2019) also found no significant difference in performance between SRI and conventional funds, challenging the notion of the existence of a sustainability premium. These inconsistencies highlight the complexities of measuring sustainability and its impact on financial performance, suggesting a need for further research.

There have been several limitations identified with the methodology of the paper that need to be considered when interpreting the results. A primary limitation stems from the data sources. The reliance on Nordnet and Avanza data introduces a potential bias, as these platforms primarily cater to Swedish investors. This may not accurately represent the broader fund landscape. Furthermore, as has been mentioned earlier, the sample size of 60 observations is relatively small. While sufficient for detecting large effects, it may lack the statistical power to uncover subtle differences or relationships. There is also the issue with the degrees of freedom. The degrees of freedom are highly restricted for some of the models given the number of variables included in relation to the number of observations. This can cause distorted model fit metrics and reduce the statistical power of the models with large amounts of variables. Future research should aim for a more diverse dataset encompassing a wider range of platforms and a larger number of funds to enhance the generalizability of the findings.

The use of three-year returns could be considered a short time horizon in investment analysis. While the decision to focus on this period was driven by the limited availability of data for Article 9 funds (introduced in 2021), it may not fully capture the long-term performance characteristics of sustainable investments. Investment strategies, particularly those related to sustainability, often require longer time horizons to demonstrate their impact. A longer-term analysis, if feasible with future data availability, would provide a more robust assessment.

Initially, the models had logged several variables of the possibility of potential non-linear relationships between variables and potential skewing of results. The models with the logged variables revealed however even more unreliable models, leading to their exclusion from the final analysis. This decision, while pragmatic, might have resulted in the omission of potentially relevant factors influencing fund fees and returns. It's highly possible that non-linear relationships exist between several variables and fund performance. These potential non-linear relationships are not adequately captured by the linear models employed.

There are also additional limitations like defining sustainability. The definition and measurement of "sustainability" can be subjective and vary across different funds. This study used a specific classification (Article 9), but other sustainability metrics could yield different results.

Other potential limitations that are worth mentioning are survivorship bias, missing variables, reverse causality and market performance. It's important to acknowledge the potential for survivorship bias, where poorly performing funds

are liquidated and removed from the dataset, potentially skewing the results. There might be other variables that are not included in the models that are relevant. The performance of sustainable funds could be influenced by specific market conditions prevailing during the three-year period under examination. There is a possibility that sustainability is not the cause for higher returns, rather, it could be that strong fund returns attract funds to be more sustainable.

6. Conclusion

This study investigated the financial characteristics of sustainable funds, specifically addressing whether they exhibit significantly different fees and returns compared to their unsustainable counterparts, and whether a "sustainability premium" could be identified. The research employed regression analysis to examine the relationship between sustainability and fund fees, as well as sustainability and fund returns. The findings indicate that the sustainability of a fund does not have a statistically significant impact on its fees. However, the regression analysis of fund returns presented mixed results. While some models suggested a statistically significant impact of sustainability on returns, these models were deemed relatively unreliable. In the most robust model, sustainability did have a statistically significant impact on returns. This would mean that sustainable funds deliver lower returns compared to their counterparts but because of the low reliability of the model, no clear conclusion can be made. Regarding the existence of a "sustainability premium," the results of this study do not provide clear support. The absence of significant differences in fees and the mixed findings concerning returns suggest that investors are not consistently paying a premium for sustainable funds. However, it's important to acknowledge the limitations of this study and that the models used were shown to be unreliable. The main implication from the paper is that investors should know that there is a possibility, based on weak evidence, that sustainable funds could yield lower returns. However, investors need not to worry about a significant sustainability premium to pay. Building upon the identified limitations and mixed results, future research should prioritize employing alternative methodologies to investigate the impact of sustainability on fund performance. This includes expanding datasets to encompass a wider range of platforms and a larger number of funds to enhance the generalizability of findings. Longer-term analyses, if feasible with future data availability, would provide a more robust assessment, as investment strategies related to sustainability often require longer time horizons to demonstrate their impact. Furthermore, exploring potential non-linear relationships between variables and fund performance, which linear models may not adequately capture, is crucial. Future studies could also benefit from focusing on specific sustainability factors, such as ESG scores or carbon footprint, rather than broad classifications, and controlling for specific market conditions that may influence the performance of sustainable funds.

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