A Work Project, presented as part of the requirements for the Award of a
Master's degree in Management, from the Nova School of Business and Economics.

THE FIRST YEAR OF THE SUSTAINABLE FINANCE DISCLOSURE REGULATION: AN INITIAL IMPACT ANALYSIS ON THE EUROPEAN MUTUAL FUND MARKET

In Collaboration with the United Nations Global Compact Norway

ANNA BIRKELBACH

Work project carried out under the supervision of

Melissa Prado

20-05-2022

The First Year of the Sustainable Finance Disclosure Regulation: An Initial Impact Analysis on the European Mutual Fund Market

Anna Birkelbach

May 20, 2022

This study examines how the classification system of the Sustainable Finance Disclosure Regulation (SFDR) affects European mutual funds after its first year of application. First, the results show that larger funds with high sustainability ratings and inflows are more likely to classify as sustainable funds under the SFDR. Second, I find that the SFDR classification has no effect on fund returns, but a positive effect fund flows and sustainability ratings. The effects are strongest in Nordic countries and for Article 9 classification.

Keywords: Sustainable Finance Disclosure Regulation, sustainable investing, ESG reporting, mutual funds, fund performance, fund flows, sustainability ratings

JEL classification: G11, G15, G23, G28, K32, M14

Acknowledgements: I thank my supervisor Melissa Prado, as well as José Albuquerque de Sousa, Abhimanyu Manimaran and Alison Rhatigan for their support. I also wish to thank my interview partners for their contribution.

This work used infrastructure and resources funded by Fundação para a Ciência e a Tecnologia (UID/ECO/00124/2013, UID/ECO/00124/2019 and Social Sciences DataLab, Project 22209), POR Lisboa (LISBOA-01-0145-FEDER-007722 and Social Sciences DataLab, Project 22209) and POR Norte (Social Sciences DataLab, Project 22209).

CONTENTS

1 INTRODUCTION

At latest since Larry Fink, founder of the world's largest asset manager BlackRock, called on CEOs around the world to address environmental, social, and governance (ESG) issues, sustainable investing has been pushed to the forefront of the financial industry's agenda (BlackRock 2020). As of March 2022, global ESG fund assets are estimated at USD 2.8 trillion, more than double the USD 1.3 trillion at the end of 2019 (Morningstar 2022c). But as more money flows into this market, so too does controversy around ESG investing. Examples such as the recent investigation into Deutsche Bank's asset management arm DWS for misstating sustainability claims have fueled accusations of greenwashing (FT 2021). In 2021, the European Union (EU) Sustainable Finance Disclosure Regulation (SFDR) came into effect. The reporting obligations aim to embed sustainability into the financial system and make sustainability claims of financial products credible and comparable for investors. Although intended as transparency regulation, it received much attention for its product classification into Article 6, 8, and 9 SFDR (ESMA 2022). The latter two are intended to distinguish sustainable investments from conventional Article 6 funds but have early been met with skepticism (Reuters 2021). The purpose of this research is to provide a first insight into how this SFDR classification has affected the mutual fund universe in Europe so far. The remaining uncertainty around the SFDR leads to the main research questions:

1 *What type of EU funds are likely to classify as Article 8 or 9 SFDR?*

2 *Does the Article 8 or 9 classification impact fund return, fund flow, or ESG rating?*

Literature suggests that ESG performance and mandatory ESG disclosure may positively affect fund performance, lead to capital reallocation, and relate to ESG ratings (Abate, Basile and Ferrari 2020). However, considering its recency, it may also happen that the SFDR has not yet had any effect at all, as some authors suggest (Zetzsche and Anker-Sørensen 2022).

Based on Morningstar data, this paper analyzes 1,036 European mutual funds with annual data between March 2021, the application date of the SFDR, and March 2022. First, I apply logit regression to examine which fund characteristics are linked to the classification as Article 8 or 9. Second, I apply bivariate and multivariate regressions to test the effects of SFDR classification on fund performance, flows, and ESG ratings. Third, I conduct interviews with Norwegian investment professionals to explore the motivations and challenges behind SFDR. Overall, the results show that larger funds with high ESG ratings, which are more growth oriented and hold smaller and less concentrated portfolios are most likely to classify as Article 8 or 9. The results further show that SFDR disclosure does not yet significantly affect fund return but has a positive effect on ESG ratings and fund flows, particularly for Article 9 classified funds.

This work adds to the literature that examines the effects of mandatory ESG disclosures. Most research studies individual company ESG reporting, while this work focuses on the disclosure by financial firms as holders of multiple individual companies. This work does not attempt to define sustainability and uses the term interchangeably with ESG criteria, which are used to make sustainability measurable. For a more detailed discussion see Bebbington and Pollard (2022).

The remainder of the thesis is organized as follows: Section 2 elaborates on the Sustainable Finance Disclosure Regulation in more detail. Section 3 positions the work in the existing literature. Section 4 describes the data collection, descriptive statistics, and methodology for analysis. Section 5 reports results from the quantitative and qualitative analyses. Section 6 discusses the findings, their limitations, and provides suggestions for future research. Section 7 concludes.

2 SUSTAINABLE FINANCE DISCLOSURE REGULATION

Since this paper studies the effects of a particular regulation, this part introduces it in more detail. The Regulation (EU) 2019/2088 on sustainability-related disclosures in the financial sector

was adopted by the EU on the 27th of November 2019 and is commonly referred to as Sustainable Finance Disclosure Regulation, short SFDR (European Parliament 2019). As part of the EU's 2018 Action Plan on Sustainable Finance, the overarching goal is to "encourage financial markets participants to pursue more sustainable investment strategies" and redirect capital towards the transition to a climate-neutral economy (ESMA 2021). The regulation applies to financial market participants (FMPs) such as asset managers and institutional investors, as well as financial advisors (FAs) (European Commission 2022). The regulation became effective in all EU member states in March 2021 and will do so in European Economic Area (EEA) states once it is transferred into national law (Adams, et al. 2021). Beyond the mandatory EEA boundary, non-EU fund managers of funds domiciled or marketed in the EU are also in scope of the SFDR (Connellan, et al. 2022).

Opposite to an all-at-once regulation, the SFDR is phased in gradually in two stages. Level 1 SFDR is already in place and mandates high-level disclosures, such as the classification of financial products into three categories: Article 6 products which do not integrate sustainability, Article 8 ('light green') products which promote environmental or social characteristics, and Article 9 ('dark green') products which target sustainable investments. For the purpose of analysis, SFDR disclosure in this thesis refers to the classification of a financial product as either Article 8 or 9.

Level 2 SFDR has been outlined in the regulatory technical standards (RTS), which have been published in April 2022 and will apply from January 2023. The RTS requires firms to report on principle adverse impacts (PAIs) as indicators of negative effects of an investment on sustainability factors. Although firms do not have to disclose PAIs until June 2023, the first reference period for PAI measurement remains effective from January to December 2022 (see Figure 1 in Appendix C) (McErlane, Shah und Everitt 2021). Long underway, the SFDR embarks on its timely debut and firms across Europe are amid of applying it.

3 LITERATURE REVIEW

Among the academic literature that guides and contextualizes this analysis, three branches are relevant to this work, namely the literature on effects of mandatory ESG disclosure, the performance of ESG funds, and the relationship between ESG ratings, fund performance, and fund flows.

In understanding potential economic effects of the SFDR, the growing literature on mandatory non-financial disclosure aims to shed light on the consequences of increasingly popular sustainability regulations. Summarized by Christensen, Hail, and Leuz (2021), the "net effects of a mandate are largely an empirical matter on which we currently do not have much research" (p.1231). However, they find that real effects are most likely to come from mandatory disclosure, and that better disclosure could lead to increased liquidity, lower cost of capital, and improved capital allocation. Ioannou and Serafeim (2017) study mandatory ESG disclosure regulations and find that increased disclosure increases firm valuation, e.g., as firms change managerial practices that result in superior performance. Khan, Serafeim, and Yoon (2016) show that firms with high ratings on material sustainability issues outperform firms with poor ratings on these issues. Krueger et al (2021) find that mandatory ESG disclosure decreases firms' stock price crashes, negative ESG incidents, and makes analyst forecasts more accurate. They also find that large firms already voluntarily disclose more ESG information as they face higher public scrutiny, have more available resources, and lower disclosure costs. This would mean that smaller firms start to disclose after larger ones. Consequently, introducing mandatory SFDR classification could influence the performance and flows, as well as related ESG ratings of disclosing funds, with large funds likely to start classifying first.

Apart from the literature on ESG disclosure, the literature on ESG performance provides important insights. A field that goes back to the 1970s (Moskowitz 1972) is concerned with the relation of ESG and corporate financial performance (Lourenço, et al. 2012). The extensive literature establishes many reasons why better ESG performance might lead to better financial

performance, such as a more innovative, forward-thinking management style that can lead to more efficient resource use and better preparedness to dealing with crises, or reputational effects helping to potentially attract better employees (Orlitzky, Schmidt and Rynes 2003). A related area of literature focuses exclusively on the performance of ESG funds. On one hand, the limited investment universe might be costly for ESG fund returns, on the other hand, ESG funds might invest in firms that yield more sustainable, long-term returns (El Ghoul and Karoui 2016). Friede, Busch and Bassen (2015, 226) establish a clear business case for ESG investing and find a nonnegative relation between firms' ESG and financial performance. However, they find mixed evidence on mutual fund studies. Due to the various fees and costs involved, the average ESG fund investor is unlikely to harvest the ESG alpha but must not expect to lose against conventional fund investments. Besides, Riedl and Smeets (2017) study motives for holding ESG funds and find investors are willing to forgo financial performance to invest in their social preferences.

To better understand how the SFDR might influence not only performance, I turn to the growing literature that examines the relation between ESG ratings, flow, and fund performance. El Ghoul and Karoui (2016) study the holding-level ESG scores of mutual funds and find they negatively predict next year's fund performance, although funds with high ESG scores have more persistent performance. The latter is in line with Benson and Humphrey (2008) who explain the persistence in performance by the difficulty of ESG investors to find alternative investments meeting their non-financial goals. Since 2016, several researchers study the introduction of Morningstar sustainability ratings – interchangeably referred to as ESG ratings in this thesis. Hartzmark and Sussman (2019) find that investors value sustainability but do not find evidence that high ranked ESG funds outperform lower ranked funds. Overall, the literature provides mixed results on funds' ESG-performance relationship (e.g., Nofsinger and Varma (2014)). Yet, several authors observe a change in evidence on ESG fund performance in recent studies (Abate, Basile and Ferrari 2020).

In fact, Ibikunle and Steffen (2017) assess European green funds over 23 years and confirm that they start to outperform their peers from 2012. The general tendency in recent literature to find a positive relationship between ESG ratings and fund performance is also documented by Steen, Moussawi and Gjolberg (2020) who observe that performance improves in conjunction with increased ESG ratings. Although literature indicates that higher classified funds may perform better in the long run, in light of the mixed evidence on mutual funds, SFDR classification unlikely corresponds with positive fund returns in the short run.

The evidence on the relation between ESG rating and fund flows is less contested. Ammann, et al. (2018) as well as Hartzmark and Sussman (2019) show that high Morningstar ESG ratings lead to net inflows. The latter authors attribute the inflows partly to social pressure but mainly to the affection of investors for sustainable investments. They also show that investors respond stronger to extreme-ranked categories, in line with a study of Aasheim, Miguel and Ramos' (2022) on Norwegian funds. This leads to expect that SFDR classification may have a positive impact on flows, and that the overall impacts of Article 9 may be stronger than for Article 8 classification.

The research on mandatory disclosure suggests that ESG disclosures meet the information demand of investors (Krueger, et al. 2021). However, ESG rating information is shown to suffer from several biases that lead to large divergences among rating providers (Berg, Kölbel and Rigobon 2022). Christensen, Serafeim and Sikochi (2021) find that ESG disclosure in fact exacerbates existing ESG rating disagreement. Therefore, the SFDR impact on ESG ratings is vague to predict, particularly in its early stage. However, assuming that ESG ratings aim to measure ESG performance, which should by theory relate to a high SFDR classification, the latter can be expected to positively affect ESG ratings. To the best of the author's knowledge, several researchers have studied the influences of ESG ratings and of firms' ESG reporting, but this research adds to existing literature by examining particularly the effect of the SFDR fund classification.

4 DATA AND METHODOLOGY

The following part describes the data retrieval and cleaning for analysis. Then, descriptive statistics explain the obtained data in more detail. Finally, this part outlines the methodology used for analysis, namely logit and multivariate regression, complemented by expert interviews.

4.1 DATA SAMPLE

The main data source in this paper is Morningstar Direct, a major provider of mutual fund data. Key factors for using Morningstar are the availability of data for non-U.S. funds and the availability of a yet rare variable on SFDR fund classification. I compile a dataset of mutual fund characteristics related to performance, flow, and ESG ratings. I first screen the database for open-end, active, mutual equity funds domiciled in Europe. I filter out index funds and include only funds with an asset allocation to equity of at least 80% to ensure comparability in performance measurement. Then, I filter for the oldest share class to avoid multiple listings of the same funds. The initial search returns 9,231 funds. For simplicity, the analysis focuses on funds that have been established before the announcement of the SFDR. After excluding funds with an inception date later than January 2019, the sample is reduced to 7,618 funds. Although the SFDR also applies to non-EAA funds marketed to EEA investors, this analysis focuses on EEA-domiciled funds only. After excluding non-EEA funds, such as Switzerland and the United Kingdom, the sample is refined to 6,319 funds. When filtering the sample for important dependent and independent variables, such as fund return, flow, and size, I receive 1,036 funds for which a complete dataset is available. This dataset is imported into Stata/SE 17.0 where fund flow and size are expressed in one billion to improve visualization. Variables with extreme outliers are winsorized at the 1% and/or 99% level. I further add three binary dummy variables to the original data set: The overall treatment variable SFDR equals 1 for a fund which is classified under the SFDR, either as Article 8 or 9, and 0 otherwise. To show the incremental effect of the two articles, I create two additional dummies, Article

8 and Article 9, that equal 1 for a fund classified as the corresponding article and 0 otherwise. For consistency, all numbers are depicted in USD and calculated as annual data based on monthly data. Pre-SFDR 2019 data is based on monthly data from 2018-12-01 to 2019-11-30; post-SFDR 2022 data is based on data from 2021-03-01 to 2022-02-28. All data has been downloaded on 12 April 2022, thus non-historical data, e.g., the SFDR classification of a fund, are as of 31 March 2022.

4.2 DESCRIPTIVE STATISTICS

The sample consists of 1,036 funds domiciled within 20 of all 30 EEA states. Almost half of the sample funds are domiciled in Luxembourg, followed by Ireland, France, Denmark, and Finland. Unsurprisingly, the base currency for more than half of the sample is Euro, followed by almost one quarter that is denominated in U.S. Dollar. For more than a third of funds, the region of sale is European Cross-Border, followed by almost one sixth that is sold Global Cross-Border. The investment area of more than a third of funds is global; one sixth invests in Europe, followed by global emerging markets and the U.S. As per Morningstar, almost one quarter of funds is categorized as Global Equity Large Cap, another quarter as Europe Equity Large Cap, followed by Europe Mid/Small Cap (see Table 2, Table 3, Table 4, Table 5, Table 6 in Appendix E).

Table 7 in Appendix E shows summary statistics for the dependent and important independent variables. The funds' annual raw return averages at -0.34% with a net expense ratio of 1.57% of assets. The average R^2 of 24.08 indicates low correlation between portfolio and benchmark returns since I filter out index funds, and the mean standard deviation of 15.25 implies higher return variability. The average fund size is USD 530 million with an annual net flow of USD 23 million. As of 2022, the most recent fund was created 4 years ago and the oldest 53 years ago. The average fund is 15 years old and has an ESG rating of 3.04, indicating average ESG performance. Table 8 in Appendix E shows some correlation with marginal significance between those variables.

Almost half (46%) of the sample and 14 out of 20 countries classify funds as either Article 8 or Article 9 under the SFDR. These 478 funds are henceforth referred to as treated funds. Nine out of ten funds (91%) who classify do so as Article 8. Only 41 funds, 4% of the total sample, classify as Article 9. Table 9 in Appendix E shows the different article profiles along several characteristic fund variables, of which Figure 2, Figure 3, Figure 4 in Appendix E depict a visual inspection.

A t-test of means (Table 10 in Appendix E) is deployed to test the statistical significance of the differences reported in the previous table. A Levene test in Stata inspects the variances of the treatment and control group for equality and identifies that an independent t-test with unequal variances is required for two-thirds of the variables, and one with equal variances otherwise. The difference between control and treatment group is significant for thirteen variables. The most significant differences imply that classified funds are on average USD 300 million or almost 1.8 times larger in size, allocate a slightly higher proportion of assets to equity, and hold 4.3 percentage points (pp) less assets in their top 10 holdings, therefore appearing less concentrated and risky. Treated funds perform better on overall and ESG ratings by almost half a point, even more so in 2022 than in 2019. Significant at the 5% level, average returns of treated funds are 1.3 pp higher than those of control funds pre-SFDR, down to 0.56 in 2022. The reduction in return differential for classified funds does not provide motivation for return-seeking funds to adopt the SFDR. However, the post-SFDR inflow is USD 37 million or seven times higher for Article 8 or 9 funds, prompting further analysis. Besides the one-year shorter manager tenure, the significant difference in environmental risk score implies that Article 8 or 9 fund investments are subject to a lower financial risk from environmental issues. Lastly, the difference in style, quality, and liquidity profile indicates that classified funds are more growth oriented and invest in more profitable and liquid firms.

Lastly, plotting the SFDR disclosure frequency against the ten domiciles with the most funds allows to compare the progress of SFDR classification by domicile (Table 11 in Appendix E).

Sweden classifies all (100%) of its funds as either Article 8 or 9, followed by Denmark with 71%, and Norway with 67%, which generally suggests a pattern of Nordic countries leading the adoption.

4.3 METHODOLOGY

The following part describes selected variables for analysis for which definitions are also provided in Table 1, Appendix D, before specifying the statistical and qualitative methods for analysis.

4.3.1 VARIABLES

Dependent variables. The empirical analysis aims to determine the impact of the SFDR on fund performance, flows, and ESG ratings. SFDR classification could have an effect on fund returns, as ESG data is most used due to its relevance to investment performance (Amel-Zadeh and Serafeim 2018). Raw fund returns are used as proxy for fund performance, in line with common practice (Hartzmark and Sussmann (2019), Ammann, et al (2018)). Because several studies also use alpha as performance indicator (Khan, Serafeim and Yoon 2016), the alternative parameter is later used to test robustness. Because research has established sustainability as a way to win inflow (Hartzmark and Sussmann 2019), it is worthwhile to study potential effects of the SFDR on fund flows. Since the introduction of the Morningstar sustainability rating in 2016, much research relates fund performance and flows to it. Most authors find that funds with higher ESG ratings experience higher net inflows (Ammann, et al. 2018). However, the evidence on ESG ratings and fund performance is mixed regarding whether high-rated funds perform better (Khan, Serafeim and Yoon (2016), Abate, Basile and Ferrari (2020)) or worse (El Ghoul and Karoui 2016). The aim of this work is to examine the relationship of these three variables with SFDR classification.

Independent variables. The independent variable of greatest interest is SFDR classification. The more stringent, overall treatment variable SFDR summarizes its combined effect, while the article dummies show the incremental effect of an Article 8 or 9 classification. Additional independent variables are included to control for other factors affecting the dependent variables so that

the true effects of the SFDR classification can be captured. The large strand of literature on fund performance evaluation provides an important framework for the relation between fund performance and factors such as fund size, age, expenses, turnover, R^2, or the number of holdings (Ammann, et al. (2018), El Ghoul and Karoui (2016, 55)). Fund age is included based on Ferreira's (2013, 502) research on non-U.S. funds that shows younger funds perform better due to stronger pressure and ability in finding attractive investment opportunities. Literature also suggests that inflows increase the younger the fund is, as they tend to be more innovative (Renneboog, Ter Horst and Zhang 2011, 579) (Cuthbertson, Nitzsche and O'Sullivan 2016, 166). Size is another widely used factor that is found to have a negative influence on performance (Grinblatt and Titman (1989), Chen, et al. (2004), Pástor, Stambaugh and Taylor (2015)). Large funds' higher liquidity is constrained by the increasing difficulty to find new ideas for further diversification, wherefore they often increase existing positions and take higher transaction costs, leading to diseconomies of scale (Chen, et al. 2004, 1289). Expenses are another central factor that explains "almost all of the predictability in mutual fund returns" according to Carhart (1997, 57), showing a one-for-one negative impact on fund performance. Despite other mixed evidence, studies on European funds support a negative relationship between fees and performance (Ferreira, et al. 2013, 502). However, expenses significantly decreased over the past decades due to investor learning and increasing evidence questioning the ability of active fund management to outperform (Barber, Odean and Zheng 2005). As additional control variable, R^2 measures the correlation of fund and benchmark performance and thereby the degree of active management (Amihud and Goyenko 2013). A lower R^2 means less correlation, indicating higher fund selectivity, which in turn leads to higher risk-adjusted return. In contrast, the standard deviation of return measures a fund's total volatility, looking at the consistency in past returns. Sharpe (1966) uses the standard deviation to measure risk-adjusted performance and equally predicts that higher risk leads to higher returns.

4.3.2 STATISTICAL ANALYSIS

Logit regression. In light of the recency of the SFDR, the first research question aims to establish which funds are most likely to classify under the SFDR. A logit regression as a binary response model tests the probability of doing so based on certain fund characteristics (Wooldridge 2013, 584ff). The binary SFDR dummy is used as dependent variable. Several independent variables are regressed on the probability of SFDR disclosure. In general, the regression tests which fund characteristics are most significant in explaining SFDR disclosure by predicting the odds, i.e., the likelihood, of a fund's SFDR disclosure based on the values of the explanatory variables.

Before running any regression, the VIF test in Stata checks the model for collinearity. The variance inflation factors (VIFs) indicate how much the effect of a variable is inflated due to multicollinearity and should preferably be below ten or five (Hair 2009) (Wooldridge 2013, 98). The VIFs are below ten in the logit model and below two in all multivariate regressions, indicating moderate to low correlation among control variables. Then, I run the following logit regression:

$$\text{logit}\,(P(SFDR_i = 1|x_{1i}, \dots, x_{ni}) = \log\left(\frac{p_i}{1-p_i}\right) = \beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + \cdots + \beta_n x_{ni} + \varepsilon_i \quad (1)$$

Where $SFDR_{i_i}$ denotes the SFDR response of a fund i, p_i the probability, and $p_i/(1-p_i)$ the corresponding odds (Rodríguez 2007), (Powers und Xie 1999, 41ff). $P(SFDR_i = 1)$ is the probability of a fund i to disclose under the SFDR, given the outcome of the *n*-number of explanatory variables $x_i, \dots, x_n$. I use 23 variables to explain SFDR disclosure, thus $n = 23$. The equation written out with all controls can be found in Table 12 in Appendix F.

Bivariate and multivariate regression. After exploring which funds are most likely to disclose under the SFDR, the effects of their classification are examined to answer this second research question. First, I apply a bivariate regression to establish the strength of the relationship between a fund's return, flow, and ESG rating and the independent variable of interest: SFDR disclosure.

Formally, the bivariate regression is performed first for overall SFDR disclosure and then for specific article disclosures, so that the regression is run twice for all three dependent variables:

$$Y_{it} = \beta_0 + \beta_1 SFDR_{it} + \varepsilon_{it} \quad (2)$$

$$Y_{it} = \beta_0 + \beta_1 Art\ 9_{it} + \beta_2 Art\ 8_{it} + \varepsilon_{it} \quad (3)$$

Where Y_{it} takes either $Return_{it}$, $Flow_{it}$, or $ESG\ Rating_{it}$. $SFDR_{it}$ identifies whether fund i discloses under the SFDR at time t, while $Art\ 8_{it}$and $Art\ 9_{it}$ show the impact of each article. The error term ε_{it} captures the difference in observed data from the actual fund population.

Second, I use multivariate regression to control for fund characteristics other than SFDR classification that might affect fund returns, flows, or ESG ratings. I run the regressions as follows:

$$Y_{it} = \beta_0 + \beta_1 SFDR_{it} + \beta_2 age_{it} + \beta_3 size_{it} + \beta_4 expenses_{it} + \beta_5 SD_{it} + \beta_6 R^2{}_{it} + \varepsilon_{it} \quad (4)$$

$$Y_{it} = \beta_0 + \beta_1 Art\ 9_{it} + \beta_2 Art\ 8_{it} + \beta_3 age_{it} + \beta_4 size_{it} + \beta_5 expenses_{it} + \beta_6 SD_{it} + \beta_7 R^2{}_{it} + \varepsilon_{it} \quad (5)$$

Where the dependent variable Y_{it} takes either $Return_{it}$, $Flow_{it}$, or $ESG\ Rating_{it}$. The control variables are the following: age_{it} is the fund age, $size_{it}$ the fund size, $expenses_{it}$ the expense ratio, SD_{it} the standard deviation of return, and $R^2{}_{it}$ the R^2 as measure of active management. A complete list of all regression equations run in this paper can be found in Table 12 in Appendix F.

4.3.3 EXPERT INTERVIEWS

The quantitative analysis is accompanied by qualitative interviews to get insights on the real challenges and motivations around SFDR disclosure. Given their leading role in SFDR adoption, I conduct six interviews with Norwegian investors in collaboration with the United Nations Global Compact (UNGC) Norway. The respondents represent mutual fund and asset management companies, private equity, venture capital, and pension funds (Table 24 in Appendix H). Following Mathers, Fox and Huhn (2002), I prepared an interview guide for the semi-structured interviews that were held between the 6th and 8th of April 2022 via Zoom. The recordings were transcribed and analyzed in an inductive approach. For confidentiality reasons, the transcripts are not disclosed.

5 RESULTS

5.1 REGRESSION RESULTS

5.1.1 CHARACTERISTICS OF FUNDS CLASSIFYING UNDER THE SFDR

The result of the logit regression (1) shows 10 of 23 fund characteristics as significant predictors of SFDR disclosure (Table 13 in Appendix F). Fund flow exerts the most predictive power, significant at the 5% level. Funds with an USD 1 billion higher inflow, ceteris paribus (c.p.), are 2.71 times more likely to classify under the SFDR. By intuition, a fund's ESG rating is another important predictor of SFDR disclosure. Significant at the 1% level, if ESG rating increases by one point, c.p., the chance of classification is 1.47 times or 47 pp higher compared to a fund with a one-point lower ESG rating. Interestingly, if the governance risk factor increases by one point, c.p., the likelihood of SFDR disclosure does by 1.42 times, significant at the 5% level. The result is ambiguous, as higher exposure to social risk reduces the likelihood by a factor of 0.82. In line with existing literature (Krueger, et al. 2021, 25), being a USD 1 billion larger fund increases the probability of being SFDR classified by 22 pp, significant at the 5% level. Two additional factors that slightly increase the likelihood of classification, although only significant at the 10% level, are higher standard deviation and recent strong performance as in momentum profile. In total, four characteristics decrease the likelihood of SFDR classification. More precisely, if a fund is one year older, having one more stock in its portfolio, plus 1% more assets concentrated in its top 10 holdings, and is more value oriented as measured by a point increase in style profile, the likelihood to be classified decreases by 0.98, 0.99, 0.98, 0.99 respectively, significant at the 10%, 5%, 1%, 5% levels. Overall, Article 8 and 9 funds are currently larger funds, that are young rather than old, report a slightly higher return variability, have recently performed well, and attracted significant inflow, have a higher ESG rating, are exposed to less social but more governance risk, and lean towards a growth investment style alongside holding a more balanced portfolio of fewer stocks.

5.1.2 FUND-LEVEL EFFECTS OF SFDR CLASSIFICATION

Subsequently, I evaluate the effects of SFDR disclosure on fund returns, fund flows, and ESG ratings using bivariate and multivariate regressions. Table 14 in Appendix F reports the results of bivariate regressions (2) and (3). Without control variables, one can see the specific effect of SFDR on the three dependent variables. The results indicate that there is no statistically significant effect on fund returns. However, it seems that SFDR disclosure impacts fund flow and ESG rating, whereby the strongest effect seems to be exerted by Article 9. Significant at the 1% level, Article 9 classification would result in a USD 137 million increase in inflow and a 0.73-point upgrade in ESG rating, c.p. Yet, the low R^2 across all three models reminds that only a small percentage of the variance in a fund's return, flow, and ESG rating can be explained by its SFDR disclosure only.

Hence, the multivariate regressions (4) and (5) are performed to test whether the distinct SFDR effect persists when controlling for basic fund characteristics. The overall results still do not show effects on fund returns but remain significant for flows and ESG ratings (Table 15 in Appendix F). As for ESG rating, all three SFDR measures report similar coefficients which remain significant at the 1% level. As in the bivariate regression, the effect of Article 9 classification proves most impactful by contributing to 0.73-point higher ESG rating, c.p., whereby Article 8 classification leads to only a 0.45-point higher ESG rating. When including control variables, the SFDR effect on fund flow partly disappears. The coefficients are smaller and the USD 37 million impact of general SFDR disclosure on flow is now only significant at the 10% level. When adding granularity however, Article 9 classification remains significant at the 1% level and increases inflows by USD 120 million. Overall, the initial impact of the SFDR appears to be phased in across the three dependent variables before it might be fully adsorbed into ESG ratings, fund flows, and ultimately returns.

5.2 ROBUSTNESS

I employ three tests to improve robustness of the regressions and confirm the obtained results.

Alternative parameters. As a first robustness check, I run the multivariate regressions (4) and (5) with alpha as alternative measure of fund performance, given that some papers use it as performance indicator (Otten and Bams 2002). Both specifications yield the same significances, signs, and similarly sized coefficients (Table 16 in Appendix G). For this reason, this test confirms the robustness of the results for various definitions of fund performance.

Additional controls. As a second robustness check, the regressions are run with additional control variables, because not including important variables might result in omitted variable bias.

The logit regression (1) was run with a set of 23 explanatory variables. To check robustness, I run the regression with less controls, which slightly increases the number of observations (Table 17 in Appendix G). The model with more controls yields more significant predictors and a higher R^2. Provided the results are comparable in size and significance levels, they appear to be robust.

To check robustness of the multivariate regressions (4) and (5), I add control variables that are not included in the base model as they reduce the number of observations by roughly 25% and explain not necessarily more than existing controls. Assessing the SFDR impact on returns with additional controls yields ambiguous results (Table 18 in Appendix G). According to the base model, general SFDR and Article 8 classification would increase returns by around 0.3 to 0.4 pp, whereas Article 9 would impact returns negatively. The coefficients increase largely as controls are added, the effect of SFDR disclosure becomes significant at the 10% level, while the impact of Article 9, although still not statistically significant, changes signs and becomes positive. This indicates that due to omitted variable bias, the base model might underestimate the effect of the SFDR. It raises the question of whether, based on the data available, the impact on return can be estimated at all. Article 8 and 9 classifications are not significant in any specification, however, there is an indication that overall SFDR classification might increase return. Conversely, including additional controls to assess fund flow yields robust results (Table 19 in Appendix G). The significance levels

remain unchanged except for overall SFDR disclosure, where it increases to 5%. The coefficients increase slightly but remain comparable and follow the same trend. However, additional controls imply a loss of around 250 observations and the decreased R^2 implies a poorer model fit. Overall, the results of the base model are confirmed, so that the Article 9 impact on fund flows can be stated with higher certainty. Lastly, the regressions on ESG rating prove to be most robust (Table 20 in Appendix G). All coefficients are of the same magnitude and significance. Coefficients differ most for Article 9 classification, where they decrease from a 0.73 to a 0.60-point impact. The results suggest no strong omitted variable bias in the base model, which therefore seems robust.

Heterogeneity analysis across domiciles. Lastly, I test whether effects of the multivariate regressions (4) and (5) hold for different domiciles. Due to the varying maturity levels of ESG markets, previously reported results could be distorted by this fact. First, I find one domicile where SFDR has a statistically significant effect on return at the 10% level (Table 21 in Appendix G). In Denmark, general SFDR disclosure increases return by 4.5 pp. The analysis is helpful in showing that SFDR classification can affect return, although it may not manifest itself across all European domiciles yet. Second, I find four domiciles in which SFDR has a statistically significant effect on fund flows (Table 22 in Appendix G). The SFDR effect ranges between USD 69 and 85 million in Spain and France, significant at the 10% level. The effects of Article 8 and 9 are much stronger in large fund domiciles such as Ireland and Luxembourg, ranging between USD 127 and 211 million, significant at the 5% and 1% level. France as the third largest domicile also shows higher flows for Article 9 funds but they account for only two-thirds and two-fifths of those in Ireland and Luxembourg. Third, I find seven domiciles for which SFDR has a significant effect on ESG ratings (Table 23 in Appendix G). In France and Germany, most effects relate to Article 8, while in Denmark, Luxembourg, and Norway most effects derive from the Article 9 classification. Meanwhile, the Article 9 effects are around four times as large for Norway and Denmark than for Luxembourg,

though all significant at the 1% level. When creating a dummy variable that bundles all Nordic domiciles, i.e., Norway, Sweden, Finland, Denmark, the average 1.25-point increase in ESG rating is still 1.7 times as large as the 0.73-point effect for the whole sample. This indicates that Nordic countries not only lead SFDR classification but also reap the most benefits in terms of ESG ratings. Overall, the results yield interesting insights and prove to be robust to several specifications.

5.3 INTERVIEW RESULTS

Adding to the results of the regression analyses, the interview partners provide insights that can help to explain what causes the observed effects in the real world (Gallo 2015). First, to contextualize the outcome of the logit regression, interviewees explain their motivations for adopting the SFDR by the fact that it is market practice, although the SFDR is not yet formally implemented into Norwegian law. Industry competition to reap potential first mover's advantages in meeting client demand and attracting new investors has led especially large, international funds to roll out the SFDR beyond their EU-marketed products to Norway. Another reason explaining Norway's adoption is the ethical investment philosophy of its sovereign wealth fund that is ingrained in the country's culture, making it not a big leap to meet SFDR requirements. Considering that only 4% of sample funds are classified as Article 9, interviewees explain common challenges around the SFDR. Next to the prevalent issue of lacking data, interviewees find that the criteria for classification are not clear enough and do not reflect all ESG investment strategies, which is why many are hesitant and classify within lower categories at first. Some interviewees with international exposure note that the SFDR is subjectively interpreted across countries based on prevailing ESG logic, adding further complexity to the classification, but explaining the heterogeneous effects observed in the multivariate robustness tests. Regarding observed effects on fund returns, all interviewees remark it is too early to tell. While some expect lower returns due to limited investment and diversification opportunities, others expect better long-term returns for higher classified funds that invest

in future-oriented and innovative firms, while again others note that returns are not the purpose of ESG investing in the first place. These mixed views reflect the equally mixed findings from this paper. Interviewees further see no change in fund flows yet but expect the SFDR Level 2 reporting to allow for more comparability and granular ESG due diligence, which is expected to impact fund flows in favor of higher classified funds, something that can already be shown by regression results. The greatest influence of the SFDR is observed on the investment process, where interviewees see changes in funds to justify their classification. The latter seems to be understood worldwide, being the first thing that distributors ask from external funds, hence likely to become a fund selection criterion in the future. This leads to a conflict many interviewees cite as an undesirable dynamic of the SFDR. Being pressured by investors filtering for Article 8 and 9 funds, and concerned about outflow and future funding, some follow a 'top-down approach' of tweaking their product to fit the classification. Others, however, comment that the SFDR was meant to be approached bottom-up, where the underlying sustainability of a product triggers its corresponding classification. Indeed, many expect to see a wave of reclassifications gravitating towards Article 8 after the Level 2 comes into effect and the market learns the stringency of article definitions and whether a premium is paid for the additional reporting burden. In their outlook for the SFDR, several interviewees are concerned about it becoming a victim of short-term competitiveness which could lead to lot of capital chasing few ESG investments, which in turn could drive up valuations and create a bubble. However, one interviewee notes that a bubble does not necessarily have to be bad but could incentivize innovation in the ESG landscape. As a bottom line, interviewees are optimistic about Level 2 SFDR, expecting it to put facts behind ESG conversations, increase comparability and transparency, allowing for better public scrutiny and disciplining. The classifications under Level 1 SFDR are viewed more critical. Interviewees observe apparent misclassifications due to lack of competence, thereby undermining credibility. Several actors seem to misinterpret the SFDR as labeling

regime, use it as branding opportunity, or see it as compliance exercise, wherefore the interviewees stress to not blindly equate a high SFDR classification with better sustainability. Nonetheless, the SFDR could have a positive internal effect of funds in rethinking their ESG strategy and normalize ESG as common sense rather than optionality in investing. The interviewees agree that it will take time until the SFDR becomes fully standardized and effective in reducing greenwashing.

6 DISCUSSION

6.1 IMPLICATIONS FOR THE MUTUAL FUND MARKET

The results of the logit regression show that large funds are among those who are most likely to classify under the SFDR. The interviewees often represent smaller firms and stress the difficulties in gathering data for SFDR Level 1 compliance. Because classified funds are characterized by high ESG ratings and fund flows, it appears as if prominent ESG leaders classify higher first. The fact that Article 8 and 9 funds are exposed to higher financial risk from governance issues than their conventional peers shows that the SFDR classification is a simplified measure that must not be blindly followed as found by Hartzmark and Sussman (2019) is the case for ESG ratings. All in all, SFDR classification may not accurately reflect the true levels of sustainability in today's fund universe. The decision to classify is driven by several practical considerations such as the fact that fund managers are wary of an initial over-classification that could later lead to reputational losses. The results of the multivariate regressions shed some light on the ambiguous ESG disclosure effects on returns. The fact that no initial impact on return is observed is confirmed by the interviewees who note that it will take longer for an effect to occur, although the results for Denmark give reason to be optimistic. Another finding worth mentioning is the fact that returns of Article 6, 8, and 9 funds do not differ significantly, which counters the literature that argues for the underperformance of ESG funds. Given the inconclusive findings, return-seeking funds may not

be motivated to classify higher than Article 6. However, the positive effect on flow confirms theory and implies the latter to be a competitive advantage, especially in developed fund markets. The well documented positive performance flow relationship leads to assume that in Article 8 and 9 funds, investors chase something different than past performance. The much higher inflows into Article 9 than Article 8 indicate the uncertainty around the broad category of Article 8 funds, reported to contain all "shades of green" (Reuters 2021). The positive relation between high SFDR classification and ESG ratings is reassuring. That this effect is significantly stronger for Article 9 in Nordic countries indicates that ESG funds are more rewarded in Nordic markets while in other European domiciles, Article 6 funds do not score that much lower than Article 8 or 9 funds. Both results for flows and ESG ratings respond differently strong per domicile to either Article 8 or 9 and seem to depend on different national factors such as the maturity of ESG markets. In summary, the results show that the SFDR already set a dynamic in motion that induces capital flows into the booming ESG market. The fact that fund managers classify funds themselves (Kolden 2022) and the number of repurposed funds hit its record at SFDR introduction might explain why the European sustainable fund market is valued at EUR 1.3 trillion, while the market as defined by SFDR classifications is worth EUR 2.5 trillion (Morningstar 2021a, 9), hence fueling debates about a possible ESG bubble (BIS 2020). As demand for funds with a sustainable label rises, regulators warn to use the SFDR as a marketing tool and interviewees suggest Level 1 may not necessarily prevent greenwashing but are optimistic about Level 2 correcting current misclassifications.

6.2 LIMITATIONS

This study is subject to several limitations, but a key issue affecting the scope and method of analysis is the availability of data. Only few variables are equally available for all funds, let alone over historical periods. A solution could be to merge data from different sources, yet to the detriment of data consistency. Notably ESG ratings vary widely across providers, as laid out by Berg,

et al. (2022), and would lead to inconsistent results. Since Morningstar is a widely cited source for mutual fund research (Blake and Morey 2000), it deems adequate as a stand-alone data source.

The limited data availability may also lead to omitted variable bias. Certain variables such as turnover or manager tenure are omitted from analysis due to lack of available data. These controls are used by other researchers such as Ammann (2018) and Chen (2004) and could potentially increase the accuracy of regression models. To address this issue, the regressions were run with additional controls and confirmed the results obtained with the existing set of variables.

Another limitation is related to the recency and limited data history of the SFDR. Zetzsche and Anker-Sørensen (2022, 36) argue that it will take years until the EU sustainable finance regulations are fully absorbed into data creation, financial modeling, and investment strategies. This study uses one year of monthly data and emphasizes that the observed results show initial, short-term effects.

6.3 FURTHER RESEARCH

Despite the outlined limitations, this study provides results which can serve as a basis for further investigation. As of January 2023, funds must detail how they meet sustainability criteria based on Level 2 SFDR. The latter is expected to have significant effects on asset allocation in the medium-to-long-term (Schoemaker 2021) and it could damage a fund's reputation to offer Article 8 or 9 products if it cannot be legitimized under Level 2 (Wilkes 2021). In fact, Morningstar already announced to drop its sustainability tag from 1,200 European funds, including Article 8 funds (Dawson 2022). Future research could examine potential reclassification effects from Level 1 to Level 2 SFDR to determine the costs associated with a downgrade in classification.

Moreover, several interviewees reported to observe an inflation of new Article 8 and particularly Article 9 products. Since this work focuses on the funds that existed prior to the SFDR, another fruitful avenue for research could examine new SFDR funds. Are they fundamentally different from the existing funds that were partly repurposed to fit the SFDR (Morningstar 2022c)?

7 CONCLUSION

This study provides an analysis of the recent SFDR regulation that was introduced to combat greenwashing in the growing ESG investing industry. The SFDR offers a unique framework for examining the literature on mandatory ESG discussions in the financial sector and is examined for initial effects on the mutual fund market. The analysis helps to predict what types of funds classify as Article 8 or 9 SFDR and how this classification relates to fund returns, flows, and ESG ratings. I study a dataset of annual data on 1,036 European mutual equity funds to provide insights into the initial impacts since the SFDR took effect. By means of statistical analysis and expert interviews, I find that the SFDR seems effective at mobilizing capital towards sustainable investments but may not be effective at reducing greenwashing just yet. First, applying logit regression, I confirm existing literature (Krueger, et al. 2021) and show that especially large funds with high ESG ratings and fund flows classify as Article 8 or 9. The strongest predictor is a fund's ESG rating, while fund age, the number of stockholdings, and portfolio concentration are negative predictors. The results indicate that SFDR funds tend to be growth oriented and more concerned with mitigating social than governance risks. Second, employing multivariate regression, I show that higher SFDR classification relates to higher inflows and ESG ratings. In line with results from Hartzmark and Sussman (2019), the highest classification, Article 9, yields the strongest effects and implies USD 120 million higher flows and a 0.73 out of 5.0 points higher ESG rating. The evidence for higher returns is inconclusive, as are literature and interview results. Consistent with the insights of Steen, Moussawi and Gjolberg (2020) this paper leans towards suggesting higher classification may offer financial reward in the future. The results taken as a whole highlight the importance of simplified sustainability measures such as ESG ratings or in this case, SFDR classification. As the interviewees suggest, the observed effects may not reflect funds' true sustainability performance which is expected to be rectified by SFDR Level 2.

REFERENCES

Aasheim, Linn K., António F. Miguel, and Sofia B. Ramos. 2022. "Star rating, fund flows and performance predictability: evidence from Norway." Financial Markets and Portfolio Management, Volume 36 29–56.

Abate, Guido, Ignazio Basile, and Pierpaolo Ferrari. 2020. "The level of sustainability and mutual fund performance in Europe: An empirical analysis using ESG ratings." Corporate Social Responsibility and Environmental Management 28(3), Jul.

Adams, John, James Gray, Jessica Brown, and James Ballantyne. 2021. "SFDR - Implications for EU and Non-EU Fund Managers." Shearman & Sterling. Mar 15. Accessed Mar 10, 2022. https://www.shearman.com/Perspectives/2021/03/SFDR--Implications-for-EU-and-Non-EU-Fund-Managers.

Amel-Zadeh, Amir, and George Serafeim. 2018. "Why and How Investors Use ESG Information: Evidence from a Global Survey." Financial Analysts Journal, Volume 74, Issue 3 87-103.

Amihud, Yakov, and Rusian Goyenko. 2013. "Mutual Fund's R2 as Predictor of Performance." Review of Financial Studies 26(3), Mar: 667–694.

Ammann, Manuel, Christopher Bauer, Sebastian Fischer, and Philipp Müller. 2018. "The impact of the Morningstar Sustainability Rating on mutual fund flows." European Financial Management Volume 25, Issue 3 520-553.

Barber, Brad M., Terrance Odean, and Lu Zheng. 2005. "Out of Sight, Out of Mind: The Effects of Expenses on Mutual Fund Flows." The Journal of Business, Vol. 78, No. 6, Nov: 2095-2120.

Bebbington, Jan, and Duncan Pollard. 2022. "ESG and sustainability – different but related ideas." Lancaster University Pentland Centre for Sustainability in Business. Mar 24. Accessed Apr 30, 2022. https://www.lancaster.ac.uk/pentland/news-and-events/blog/esg-and-sustainability-different-but-related-ideas.

Benson, Karen L., and Jacquelyn E. Humphrey. 2008. "Socially responsible investment funds: Investor reaction to current and past returns." Journal of Banking & Finance, Volume 32, Issue 9 1850-1859.

Berg, Florian, Julian F. Kölbel, and Roberto Rigobon. 2022. "Aggregate Confusion: The Divergence of ESG Ratings." Forthcoming Review of Finance.

BIS. 2020. "The green swan - Central banking and financial stability in the age of climate change." Bank for International Settlements. Jan. Accessed May 1, 2022. https://www.bis.org/publ/othp31.pdf.

BlackRock. 2020. "Larry Fink's 2020 Letter to CEOs: A Fundamental Reshaping of Finance." BlackRock. Jan. Accessed Apr 30, 2022. https://www.blackrock.com/corporate/investor-relations/2020-larry-fink-ceo-letter.

Blake, Christopher R., and Matthew R. Morey. 2000. "Morningstar Ratings and Mutual Fund Performance." The Journal of Financial and Quantitative Analysis, Vol. 35, No. 3 451-483.

Carhart, Mark M. 1997. "On Persistence in Mutual Fund Performance." The Journal of Finance, Vol. 52, No. 1, Mar: 57-82.

Chen, Joseph, Harrison Hong, Ming Huang, and Jeffrey D. Kubik. 2004. "Does Fund Size Erode Mutual Fund Performance? The Role of Liquidity and Organization." American Economic Review, Vol. 94, No. 5, Dec: 1276-1302.

Christensen, Dane M., George Serafeim, and Siko Sikochi. 2021. "Why is Corporate Virtue in the Eye of the Beholder? The Case of ESG Ratings." The Accounting Review.

Christensen, Hans B., Luzi Hail, and Christian Leuz. 2021. "Mandatory CSR and sustainability reporting: economic analysis and literature review." Review of Accounting Studies, 26 1176–1248.

Connellan, Clare, Genevra Forwood, James Killick, Jacquelyn MacLennan, Chris McGarry, Fabienne Vermeeren, William De Catelle, and Guillermo Giralda Fustes. 2022. "European Commission issues major proposal on due diligence obligations to protect human rights and the environment across supply chains." White & Case. Feb 24. Accessed Mar 10, 2022. https://www.whitecase.com/publications/alert/european-commission-issues-major-proposal-due-diligence-obligations-protect.

Cuthbertson, Keith, Dirk Nitzsche, and Niall O'Sullivan. 2016. "A review of behavioural and management effects in mutual fund performance." International Review of Financial Analysis, 162–176.

Dawson, Christine. 2022. "Morningstar drops sustainable tag from 1,200 funds." ESG Clarity. Feb 14. Accessed May 5, 2022. https://esgclarity.com/morningstar-drops-sustainable-tag-from-1200-funds/.

El Ghoul, Sadok, and Aymen Karoui. 2016. "Does corporate social responsibility affect mutual fund performance and flows?" Journal of Banking and Finance 77 (2017), Dec 28: 53–63.

ESMA. 2021. "Question related to Regulation (EU) 2019/2088 of the European Parliament and of the Council of 27 November 2019 on sustainability-related disclosures in the financial services sector (Sustainable Finance Disclosure Regulation 2019/2088)." ESMA. Jul 14. Accessed Mar 10, 2022. https://www.esma.europa.eu/sites/default/files/library/sfdr_ec_qa_1313978.pdf.

ESMA. 2022. "Key priorities for the asset management industry in 2022: sustainable finance and systemic risk." ICI Investment Management Conference 2022. Mar 24. Accessed May 1, 2022. https://www.esma.europa.eu/file/123465/download?token=Zroo8mJ2.

European Commission. 2022. "Sustainability-related disclosure in the financial services sector." European Commission. Apr 6. Accessed Apr 10, 2022. https://ec.europa.eu/info/business-economy-euro/banking-and-finance/sustainable-finance/sustainability-related-disclosure-financial-services-sector_en.

European Parliament. 2019. "Regulation (EU) 2019/2088 of the European Parliament and of the Council of 27 November 2019 on sustainability-related disclosures in the financial services sector." European Union Law. Nov 27. Accessed Feb 1, 2022. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32019R2088.

Eurosif. 2021. "Infographic on Sustainable finance disclosure requirements." Eurosif. Dec 07. Accessed May 5, 2022. https://www.eurosif.org/news/infographic-on-sustainable-finance-disclosure-requirements/.

Ferreira, Miguel A., Aneel Keswani, António F. Miguel, and Sofia B. Ramos. 2013. "The Determinants of Mutual Fund Performance: A Cross-Country Study." Review of Finance, Volume 17, Issue 2, Apr: 483–525.

Friede, Gunnar, Timo Busch, and Alexander Bassen. 2015. "ESG and financial performance: aggregated evidence from more than 2000 empirical studies." Journal of Sustainable Finance & Investment, Volume 5, Issue 4 210-233.

FT. 2021. "DWS probes spark fears of greenwashing claims across investment industry." Financial Times. Aug 31. Accessed May 5, 2022. https://www.ft.com/content/a3d6a8d1-0800-41c9-ab92-c0d9fce1f6e1.

Gallo, Amy. 2015. "A Refresher on Regression Analysis." Harvard Business Review. Nov 4. Accessed Mar 16, 2022. https://hbr.org/2015/11/a-refresher-on-regression-analysis.

Grinblatt, Mark, and Sheridan Titman. 1989. "Mutual Fund Performance: An Analysis of Quarterly Portfolio Holdings." The Journal of Business, Vol. 62, No. 3, Jul: 393-416.

Hair, Joseph F. 2009. Multivariate Data Analysis. US: Pearson Education.

Hartzmark, Samuel M., and Abigail B. Sussmann. 2019. "Do Investors Value Sustainability? A Natural Experiment Examining Ranking and Fund Flows." The Journal of Finance, Aug 9: 2789-2837.

Ibikunle, Gbenga, and Tom Steffen. 2017. "European Green Mutual Fund Performance: A Comparative Analysis with their Conventional and Black Peers." Journal of Business Ethics, Volume 145 337-355.

Khan, Mozaffar, George Serafeim, and Aaron Yoon. 2016. "Corporate Sustainability: First Evidence on Materiality." The Accounting Review, Nov: 1697-1724.

Kolden, Martin Fuglseth. 2022. "Norwegian FSA expects firms to prepare for 2022 SFDR implementation." AM-Watch. Feb 11. Accessed Mar 10, 2022. https://amwatch.com/article13629826.ece.

Krueger, Philipp, Zacharias Sautner, Dragon Yongjun Tang, and Rui Zhong. 2021. "The Effects of Mandatory ESG Disclosure Around the World." European Corporate Governance Institute, Dec: Working Paper No 754/2021.

Lourenço, Isabel, Manuel Castelo Branco, José Dias Curto, and Teresa Eugenio. 2012. "How Does the Market Value Corporate Sustainability Performance?" Journal of Business Ethics, Volume 108 417–428.

Mathers, Nigel, Nick Fox, and Amanda Huhn. 2002. "Using Interviews in a Research Project." Trent Focus Group. Accessed Mar 15, 2022. http://web.simmons.edu/~tang2/courses/CUAcourses/lsc745/sp06/Interviews.pdf.

McErlane, Caitlin, Shaneil Shah, and Kimberly Everitt. 2021. "EU: Commission delays SFDR RTS implementation to 2023." Baker McKenzie. Dec 8. Accessed Mar 10, 2022. https://insightplus.bakermckenzie.com/bm/banking-finance_1/eu-commission-delays-sfdr-rts-implementation-to-2023/.

Morningstar. 2022a. "Factor Profile." Morningstar. Accessed Mar 20, 2022. https://www.morningstar.com/products/factor-profile.

—. 2022b. "Fund Investor Glossary." Morningstar. Accessed Mar 20, 2022. https://mfi.morningstar.com/glossary.aspx.

—. 2022c. "Global Sustainable Fund Flows: Q1 2022 in Review." Morningstar. May 3. Accessed May 10, 2022. https://www.morningstar.com/lp/global-esg-flows.

—. 2022d. "Investing Definitions and Financial Terms." Morningstar. Accessed Mar 20, 2022. https://www.morningstar.com/investing-definitions.

—. 2022e. "Mutual Funds: Data Definitions." Morningstar. Accessed Mar 20, 2022. https://awgmain.morningstar.com/webhelp/glossary_definitions/indexes/mfportfolio.htm.

—. 2021a. "Global Sustainable Fund Flows: Q1 2021 in Review." Morningstar. Apr 30. Accessed May 6, 2022. https://www.morningstar.com/content/dam/marketing/shared/pdfs/Research/global-esg-q1-2021-flow-report.pdf?utm_source=eloqua&utm_medium=email&utm_campaign=&utm_content=27223.

—. 2021b. "Our New Rating Measures a Stock's ESG Risk." Morningstar. Mar 12. Accessed Mar 20, 2022. https://www.morningstar.com/articles/1039219/our-new-rating-measures-a-stocks-esg-risk.

—. 2019. "Morningstar Factor Profile Methodology." Morningstar. Nov 20. Accessed Mar 20, 2022. https://www.morningstar.com/content/dam/marketing/shared/pdfs/Research/Factor_Profile_Methodology.pdf.

Moskowitz, Milton. 1972. "Choosing Socially Responsible Stocks." Business and Society, Volume 1 1-75.

Nofsinger, John, and Abhishek Varma. 2014. "Socially responsible funds and market crises." Journal of Banking & Finance, Volume 48 180-193.

Orlitzky, Marc, Frank L. Schmidt, and Sara L. Rynes. 2003. "Corporate Social and Financial Performance: A Meta-Analysis." Organization Studies, Vol 24, Issue 3 403-441.

Otten, Roger, and Dennis Bams. 2002. "European Mutual Fund Performance." European Financial Management, Volume 8, Number 1 75-101.

Pástor, Ľuboš, Robert F. Stambaugh, and Lucian A. Taylor. 2015. "Scale and skill in active management." Journal of Financial Economics, Volume 116, Issue 1, Apr: 23-45.

Powers, Daniel A., and Yu Xie. 1999. Statistical Methocs for Categorical Data Analysis. Academic Press.

Renneboog, Luc, Jenke Ter Horst, and Chendi Zhang. 2011. "Is ethical money financially smart? Nonfinancial attributes and money flows of socially responsible investment funds." Journal of Financial Intermediation, Volume 20, Issue 4, Oct: 562-588.

Reuters. 2021. "Fifty shades of green: EU sustainable fund rules muddy the waters." Reuters. Apr 19. Accessed May 5, 2022. https://www.reuters.com/business/sustainable-business/fifty-shades-green-eu-sustainable-fund-rules-muddy-waters-2021-08-19/.

Riedl, Arno, and Paul Smeets. 2017. "Why Do Investors Hold Socially Responsible Mutual Funds?" The Journal of Finance, Volume 72, Issue 6, Aug 1: 2505-2550.

Rodríguez, Germán. 2007. "Chapter 3: Logit Models for Binary Data." Lecture Notes on Generalized Linear Models. Accessed 4 1, 2022. https://data.princeton.edu/wws509/notes/c3.pdf.

Schoemaker, Anne. 2021. "Momentum Around Principal Adverse Impact Data Remains Strong Despite SFDR Delays." Sustainalytics. Nov 2. Accessed Apr 13, 2022. https://www.sustainalytics.com/esg-research/resource/investors-esg-blog/PAI-data-remains-strong.

Serafeim, George, and Ioannis Ioannou. 2017. "The Consequences of Mandatory Corporate Sustainability Reporting." Harvard Business School Research Working Paper No. 11-100.

Sharpe, William F. 1966. "Mutual Fund Performance." The Journal of Business, Vol. 39, No. 1, Jan: 119-138.

Steen, Marie, Julian Taghawi Moussawi, and Ole Gjolberg. 2020. "Is there a relationship between Morningstar's ESG ratings and mutual fund performance?" Journal of Sustainable Finance & Investment, Volume 10, Number 4 349-370.

Wilkes, Tommy. 2021. "Fifty shades of green: EU sustainable fund rules muddy the waters." Reuters. Aug 19. Accessed Mar 12, 2022. https://www.reuters.com/business/sustainable-business/fifty-shades-green-eu-sustainable-fund-rules-muddy-waters-2021-08-19/.

Wooldridge, Jeffrey M. 2013. Introductory Econometrics: A Modern Approach (Fifth Edition). Mason, Ohio: South-Western.

Zetzsche, Dirk A., and Linn Anker-Sørensen. 2022. "Regulating Sustainable Finance in the Dark." European Business Organization Law Review, Volume 23 47–85.

APPENDICES

APPENDIX A. LIST OF FIGURES AND TABLES

LIST OF FIGURES

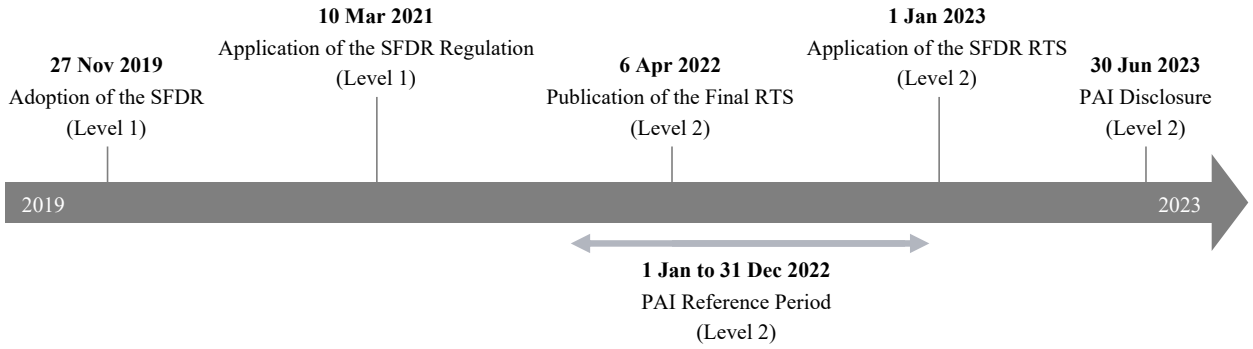
LIST OF TABLES

APPENDIX B. LIST OF ABBREVIATIONS

AIFMD	Alternative Investment Fund Manager Directive
AUM	Assets Under Management
C.P.	Ceteris Paribus
CSRD	Corporate Sustainability Reporting Directive
E&S	Environmental and Social
EEA	European Economic Area
ESAP	European Single Point of Access
ESG	Environmental, Social, Governance
EU	European Union
EUR	Euro
FA	Financial Advisor
FMP	Financial Market Participant
GP	General Partner
I.A.	Inter Alia
I.E.	Id Est
LP	Limited Partner
MS	Morningstar
PAI	Principle Adverse Sustainability Impacts
PE	Private Equity
PP	Percentage Points
RTS	Regulatory Technical Standards
SD	Standard Deviation
SE	Standard Error
SFDR	Sustainable Finance Disclosure Regulation
SRI	Socially Responsible Investment
U.S.	United States of America
UNGC	United Nations Global Compact
USD	United States Dollar
VC	Venture Capital

APPENDIX C. SFDR TIMELINE

Figure 1. SFDR Timeline



Source: Own depiction following Eurosif (2021)

APPENDIX D. VARIABLE DEFINITIONS

Table 1. Variable Definitions

Variable	**Unit**	**Definition**
Alpha	%	Excess return relative to a benchmark return, showing the effectiveness of active fund management. A positive Alpha figure indicates the portfolio has performed better than its level of risk would predict.
Article 8	Binary dummy	States whether a fund is classified as Article 8 SFDR.
Article 9	Binary dummy	States whether a fund is classified as Article 9 SFDR.
Asset in Top 10 Holdings	%	The aggregate assets, expressed as percentage, of the fund's top 10 portfolio holdings. This figure is a measure of portfolio concentration and risk. The higher the percentage, the more concentrated the fund is in a few companies or issues, and the more the fund is subject to market fluctuations in these few holdings.
Average Manager Tenure	Years	The average number of years the current manager(s) has been portfolio manager of the fund. Not reported if fund has single manager with tenure of less than six months.
Environmental, Social, Governance Risk Scores	0-50	Morningstar ESG risk scores measure the degree to which a fund is exposed to and manages ESG risk. It is an absolute measure of risk, thus, comparable across different issues, companies, and industries. Scores range from 0 to 50 points. A lower score indicates lower risk: a score of 0-10 means negligible risk; 10-20 low; 20-30 medium; 30-40 high; and 40+ severe risk.
ESG Rating	1-5	For simplicity, the Morningstar Sustainability Rating is referred to as ESG rating. A relative measure of ESG risk within a peer group. Funds are given values between 1 and 5 globes with 1 signaling the highest ESG risk.
Flow	USD billion	Estimated comprehensive fund-level net flow.
Fund Age	Years	Fund age is expressed in the number of years since inception. The variable was calculated in Excel for 2019 and 2022 based on the funds' launch date.
Fund Size	USD billion	Aggregated fund size from share classes.
Liquidity Profile	1-100	Describes the trading frequency, based on share turnover. Higher values mean high exposure and higher turnover.
Momentum Profile	1-100	Describes how much a stock has risen in price relative to other stock, based on returns. Higher values mean lower exposure to momentum factor, indicating recently well performance.
Net Assets allocated to Equity	%	Captures the percentage of fund net assets allocated to equity.
Net Expense Ratio	%	Annual Report Net Expense Ratio, expressed as the percentage of assets deducted each fiscal year for fund expenses.

		Pulled by Morningstar from the fund's audited annual report, thus reflecting actual fees charged during a particular fiscal year, also referred to as the Audited Expense Ratio. Historic data is provided for every year. Data for 2019 and 2021 is selected as it fits best with the other variables.
Overall Rating	1-5	Also referred to as star rating, the Morningstar Rating compares the past performance of funds within the same category. The overall rating is the weighted average of all Morningstar Ratings of a fund. A 5-star rating marks the top 10%, while a 1-star rating marks the bottom 10% within the Morningstar category.
Quality Profile	1-100	Describes the profitability and financial leverage of a company, based on return-on-equity and debt-to-capital ratios. Higher value means lower exposure to quality factor, thus lower quality of firm.
R^2	%	Measure of correlation between fund returns and benchmark returns. Expressed as percentage from 1 to 100. Below 40 implies low correlation, above 70 implies high correlation.
Return	%	Fund annual raw return.
SFDR	Binary dummy	States whether a fund is classified as either Article 8 or Article 9 under the SFDR.
Size Profile	1-100	Describes market capitalization of company. Higher value means larger market capitalization.
Standard Deviation	%	Represents return variability of a mutual fund. Higher values mean greater volatility.
Stock Holdings	#	The total number of different holdings of a fund, not including a fund's short positions. A measure of portfolio risk. The lower the value, the more concentrated the fund is. The higher the value, the more diversified a fund is.
Style Profile	1-100	Indicates a fund's value-growth exposure. Lower values imply growth-oriented funds. Higher values imply funds that are more value oriented.
Tracking Error	%	Tracking error describes as the divergence between portfolio and benchmark return behavior. It measures volatility in terms of how well the fund tracks the benchmark during the investment period. A high tracking error indicates an active management strategy.
Volatility Profile	1-100	Describes the variability of long-term returns. Higher value means lower exposure to volatility, thus less variation in long-term returns.
Yield Profile	1-100	Describes the dividend yield of a company. Higher value means lower exposure to yield factor, thus a lower yield for investors.

Sources: Morningstar (2019), (2022a), (2022b), (2022d), (2022e), (2021b)

APPENDIX E. DESCRPTIVE STATISTICS

Table 2. Tabulation of Domiciles

Domicile	Frequency	Percent	%<=
Luxembourg	480	46.330	46.330
Ireland	122	11.780	58.110
France	110	10.620	68.730
Denmark	63	6.080	74.810
Finland	60	5.790	80.600
	60	5.790	86.390
Germany			
Spain	36	3.470	89.860
Sweden	25	2.410	92.280
Norway	24	2.320	94.590
Liechtenstein	18	1.740	96.330
	10	0.970	97.300
Austria			
Greece	8	0.770	98.070
Italy	4	0.390	98.460
Portugal	4	0.390	98.840
Slovenia	4	0.390	99.230
	2	0.190	99.420
Belgium			
Estonia	2	0.190	99.610
Poland	2	0.190	99.810
Lithuania	1	0.100	99.900
Netherlands	1	0.100	100.000

Table 3. Tabulation of Top 5 Base Currencies

Base Currency	Frequency	Percent	%<=
Euro	586	56.560	56.560
US Dollar	255	24.610	81.180
Danish Krone	58	5.600	86.780
Swedish Krona	36	3.470	90.250
Norwegian Krone	28	2.700	92.950

Table 4. Tabulation of Top 10 Regions of Sale

Region of Sale	Frequency	Percent	%<=
European Cross-Border	381	36.810	36.810
Global Cross-Border	167	16.140	52.950
France	98	9.470	62.420
Denmark	58	5.600	68.020
Germany	51	4.930	72.950
Nordic Cross-border	40	3.860	76.810
Spain	39	3.770	80.580
Finland	38	3.670	84.250
Pure Offshore	34	3.290	87.540
Italy	31	3.000	90.530

Table 5. Tabulation of Top 10 Investment Areas

Investment Area	Frequency	Percent	%<=
Global	353	34.110	34.110
Europe	163	15.750	49.860
Global Emerging Mkts	86	8.310	58.160
United States of America	86	8.310	66.470
Euroland	55	5.310	71.790
Japan	27	2.610	74.400
France	25	2.420	76.810
Asia Pacific ex Japan ex Australia	23	2.220	79.030
Europe (North)	22	2.130	81.160
Sweden	15	1.450	82.610

Table 6. Tabulation of Top 5 Global Categories

Global Category	Frequency	Percent	%<=
Global Equity Large Cap	245	23.650	23.650
Europe Equity Large Cap	243	23.460	47.100
Europe Equity Mid/Small Cap	98	9.460	56.560
Global Emerging Markets Equity	92	8.880	65.440
Asia ex-Japan Equity	40	3.860	69.310
US Equity Large Cap Blend	40	3.860	73.170
Japan Equity	27	2.610	75.770
Equity Miscellaneous	24	2.320	78.090
US Equity Large Cap Growth	23	2.220	80.310
Real Estate Sector Equity	18	1.740	82.050

Table 7. Summary Statistics

	N	Mean	Median	SD	Min	Max
Return (%)	1036	-.34	1.77	11.37	-46.85	36.54
Flow (USD billion)	1036	.02	-0.00	.22	-1.36	1.77
ESG Rating	968	3.04	3.00	1.08	1.00	5.00
Fund Age (years)	1036	15.05	14.00	8.34	4	53
Fund Size (USD billion)	1036	.53	0.16	1.19	0	14.82
Net Expense Ratio (%)	1036	1.57	1.47	.92	0	9.77
R^2 (%)	1036	24.08	22.98	14.23	0	87.89
Standard Deviation (%)	1025	15.25	14.75	4.21	6.42	36.07

Table 8. Correlation Matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Return (%)	1.000							
(2) Flow (USD billion)	0.118*	1.000						
(3) ESG Rating	-0.008	-0.004	1.000					
(4) Fund Age (years)	-0.008	-0.046	-0.003	1.000				
(5) Fund Size (USD billion)	-0.024	0.169*	0.055*	0.066*	1.000			
(6) Net Expense Ratio (%)	-0.021	0.055*	0.024	0.064*	-0.012	1.000		
(7) Standard Deviation (%)	-0.212*	-0.024	0.047	0.009	0.020	0.007	1.000	
(8) R^2 (%)	0.228*	0.020	-0.222*	0.054*	-0.040	-0.003	-0.301*	1.000

**** p<0.01, ** p<0.05, * p<0.1*

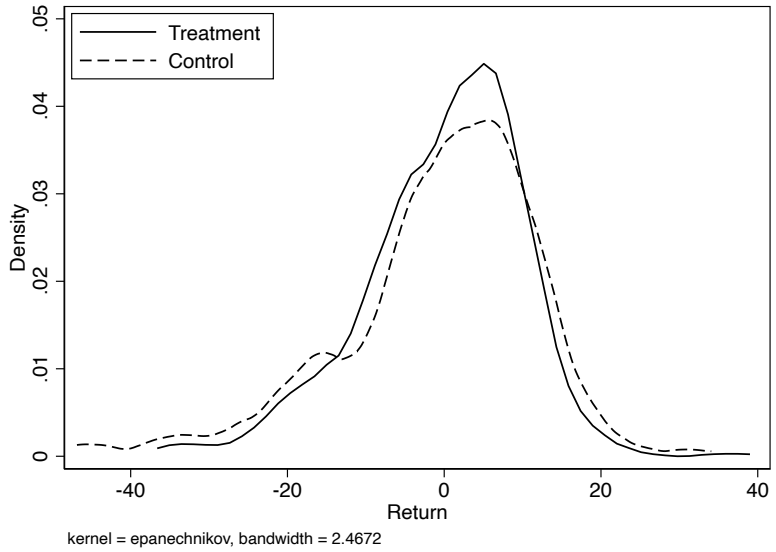
The correlation coefficients are mixed with equally positive and negative signs. Fund returns is positively correlated with fund flow and R^2; and negatively correlated with ESG rating, fund age, fund size, expense ratio, and standard deviation. Returns correlate weakest with ESG rating and fund age, and strongest with R^2 at 0.228. Fund flow is positively correlated with fund size, expense ratio, and R^2; and negatively correlated with ESG rating, fund age, and standard deviation. Flows correlate weakest with ESG rating, and strongest with fund size at 0.169. ESG rating is positively correlated with fund size, expense ratio and standard deviation; and negatively correlated with fund age and R^2. ESG ratings correlate weakest with fund age, and strongest with R^2 at -0.222. The overall weakest correlation occurs between ESG rating and fund age; and expense ratio and R^2 at -0.003. The strongest correlation occurs between fund return and R^2, which describes how much fund returns deviate from benchmark returns. Noteworthy to mention that none of the correlations are significant at the 1% or 5% level, but many are at the 10% level.

Table 9. SFDR Fund Type Characteristics

				Treatment	
	N	Total	Control	Article 8	Article 9
Frequency		1,036	558	437	41
Percent		100.00%	53.86%	42.18%	3.96%
Mean					
Return (%)	1,036	-0.34	-0.60	0.08	-1.24
Flow (USD billion)	1,036	0.02	0.01	0.03	0.14
ESG Rating	968	3.04	2.82	3.26	3.55
Fund Age (years)	1,036	15.05	15.44	14.48	15.00
Fund Size (USD billion)	1,036	0.53	0.39	0.66	1.09
Net Expense Ratio (%)	1,036	1.57	1.57	1.59	1.37
R^2 (%)	1,036	24.08	24.03	24.10	24.50
Standard Deviation (%)	1,025	15.25	15.08	15.39	15.96
Average Manager Tenure (years)	852	7.76	8.38	7.21	6.82
Stock Holdings (#)	1,036	112.90	118.81	106.83	97.22
Net Asset Allocation to Equity (%)	1,026	96.67	96.28	97.21	96.11
Assets in Top 10 Holdings (%)	979	41.57	43.64	39.55	36.52
Overall Rating	983	3.06	2.87	3.25	3.47
Environmental Risk Score	962	4.07	4.22	3.86	4.30
Social Risk Score	962	7.84	7.94	7.76	7.59
Governance Risk Score	962	6.51	6.53	6.51	6.25
Style Profile	1,030	44.78	47.14	43.09	30.85
Yield Profile	1,030	56.41	55.89	55.90	68.70
Momentum Profile	1,030	52.07	52.36	51.18	57.56
Quality Profile	1,030	44.13	46.11	41.71	43.26
Volatility Profile	1,030	47.48	46.03	49.28	47.81
Liquidity Profile	1,030	53.49	52.05	55.53	51.13
Size Profile	1,030	52.78	52.27	53.60	50.92

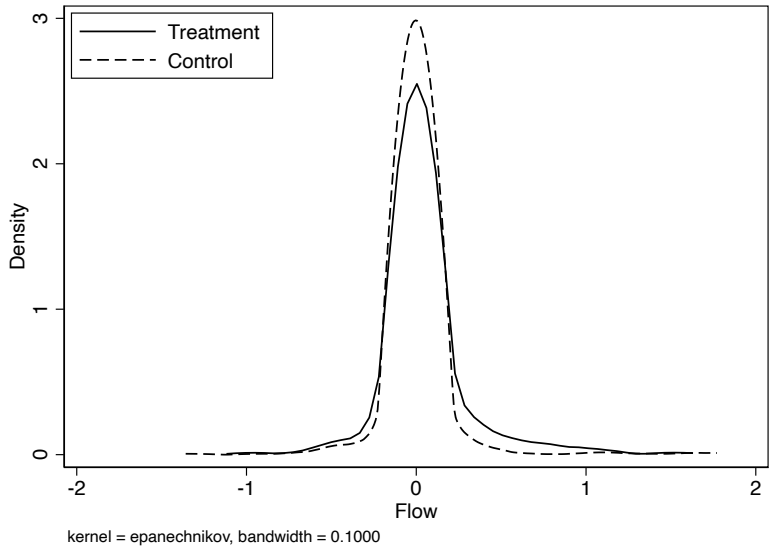
Article 9 funds seem to perform worst in terms of returns but reap the most inflow. At the same time, Article 9 funds seem the oldest and largest funds, with a correspondingly lower expense ratio and lower manager tenure. Compared to unclassified funds, Article 8 and 9 funds seem to hold fewer stocks in their portfolio and allocate fewer assets to their top 10 holdings, indicating a more selective approach. Consistent with SFDR logic, their sustainability and overall rating as seem considerably higher. Surprisingly, treated funds seem to be exposed to only slightly less ESG risk, as measured by lower ESG risk scores, and Article 9 funds seem to not automatically score better on any ESG risk category, given the higher environmental risk score. When looking at the funds' Morningstar factor profile, Article 9 funds seem to differ from Article 8 funds specifically in two categories. The lower score in its style profile would imply Article 9 funds are more growth and less value oriented, while the higher yield score would indicate a lower dividend yield for investors. A slightly higher momentum score would mean that Article 9 funds performed less well recently than Article 8 funds, which is reflected in the difference in average returns.

Figure 2. Return Distribution by Treatment



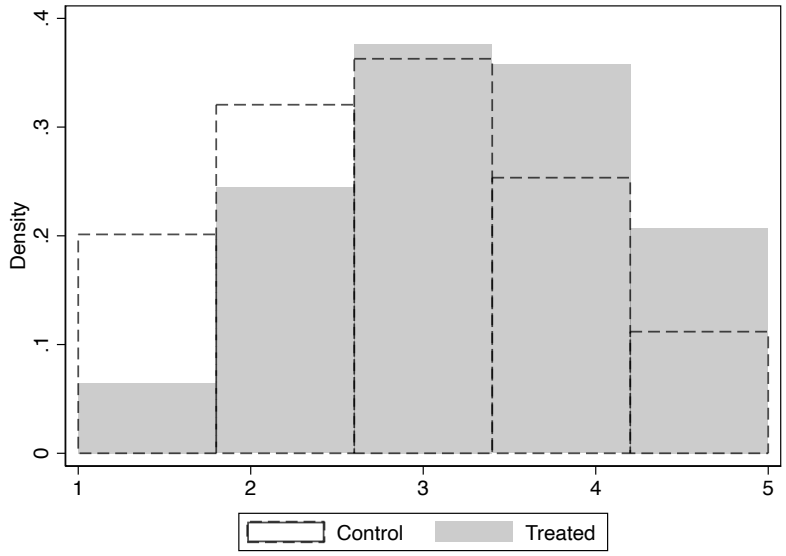
The graphical comparison of returns seems to reveal no significant differences in returns for treated and control funds. Upon closer inspection, unclassified control fund returns seem more extreme, especially in the negative range. Classified fund returns tend to be distributed more around the mean, showing less returns in the lower negative and upper positive range.

Figure 3. Flow Distribution by Treatment



As with returns, the fund flow of treatment and control funds seem not to differ significantly. Control funds seem stronger distributed in the smaller million range and to have more extreme outliers. They report the strongest net outflow at USD 1.4 billion and the strongest net inflow at USD 1.8 billion. In comparison, treated fund flows show a flatter distribution. Noticeable is their stronger prevalence in the mid six-digit range, indicating higher fund flows.

Figure 4. ESG Rating Distribution by Treatment



The overall ESG rating of the fund sample shows a general tendency to be distributed toward the higher rating categories. When separating the sample into treatment and control funds, there appears to be a great difference in rating distribution. In fact, while the average rating of control funds is 2.8, that of control funds is 3.3 on average.

Table 10. T-Test of SFDR Fund Type Characteristics by Treatment

	Total	Control	Treatment	Difference in Means	T-Statistic
Frequency	1,036	558	478		
Percent	100.00%	53.86%	46.14%		
Mean					
Return 2019 (%)	11.48	10.86	12.19	-1.332**	(-3.04)
Return 2022 (%)	-0.34	-0.60	-0.04	-0.559	(-0.80)
Flow 2019 (USD billion)	-0.01	-0.01	-0.02	0.00638	(0.73)
Flow 2022 (USD billion)	0.02	0.01	0.04	-0.0368**	(-2.67)
ESG Rating 2019	3.05	2.90	3.21	-0.311***	(-4.71)
ESG Rating 2022	3.04	2.82	3.29	-0.471***	(-6.97)
Fund Age (years)	15.05	15.44	14.60	0.843	(1.61)
Fund Size (USD billion)	0.53	0.39	0.69	-0.305***	(-4.12)
Net Expense Ratio (%)	1.57	1.57	1.57	0.00420	(0.07)
R^2 (%)	24.08	24.03	24.14	-0.110	(-0.13)
Standard Deviation (%)	15.25	15.08	15.44	-0.362	(-1.39)
Average Manager Tenure (years)	7.76	8.38	7.18	1.198**	(3.28)
Stock Holdings (#)	112.90	118.81	106.01	12.80	(0.48)
Net Asset Allocation to Equity (%)	96.67	96.28	97.12	-0.838***	(-3.85)
Assets in Top 10 Holdings (%)	41.57	43.64	39.30	4.339***	(3.55)
Overall Rating	3.06	2.87	3.27	-0.395***	(-6.14)
Environmental Risk Score	4.07	4.22	3.89	0.329**	(3.10)
Social Risk Score	7.84	7.94	7.74	0.191	(1.46)
Governance Risk Score	6.51	6.53	6.49	0.0418	(0.40)
Style Profile	44.78	47.14	42.04	5.099**	(3.16)
Yield Profile	56.41	55.89	57.00	-1.108	(-0.67)
Momentum Profile	52.07	52.36	51.72	0.641	(0.37)
Quality Profile	44.13	46.11	41.84	4.271**	(2.74)
Volatility Profile	47.48	46.03	49.16	-3.132	(-1.93)
Liquidity Profile	53.49	52.05	55.15	-3.106*	(-1.97)
Size Profile	52.78	52.27	53.37	-1.107	(-0.62)

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 11. SFDR Disclosure of Top 10 Domiciles by Number of Funds

				Treatment	
Domicile	Total	Control	Treatment	Article 8	Article 9
Luxembourg	480	255	225	200	25
	(100.00)	(53.12)	(46.88)	(41.67)	(5.21)
Ireland	122	72	50	49	1
	(100.00)	(59.02)	(40.98)	(40.16)	(0.82)
France	110	54	56	48	8
	(100.00)	(49.09)	(50.91)	(43.64)	(7.27)
Denmark	63	18	45	43	2
	(100.00)	(28.57)	(71.43)	(68.25)	(3.17)
Finland	60	36	24	23	1
	(100.00)	(60.00)	(40.00)	(38.33)	(1.67)
Germany	60	44	16	16	0
	(100.00)	(73.33)	(26.67)	(26.67)	(0.00)
Spain	36	27	9	9	0
	(100.00)	(75.00)	(25.00)	(25.00)	(0.00)
Sweden	25	0	25	24	1
	(100.00)	(0.00)	(100.00)	(96.00)	(4.00)
Norway	24	8	16	13	3
	(100.00)	(33.33)	(66.67)	(54.17)	(12.50)
Liechtenstein	18	14	4	4	0
	(100.00)	(77.78)	(22.22)	(22.22)	(0.00)

Row percentages parentheses

APPENDIX F. REGRESSION

Table 12. Regression Equations

Logit Regression	
$\text{logit}\,(P(SFDR_i = 1\|x_{1i}, \dots, x_{23i}) = \log\left(\frac{p_i}{1-p_i}\right) = \beta_0 + \beta_1 return_{1i} + \beta_2 flow_{2i} + \beta_3 ESG\ rating_{3i} + \beta_4 age_{4i} + \beta_5 size_{5t} + \beta_6\ expenses_{6t} + \beta_7\ SD_{7t} + \beta_8 R^2{}_{8t} + \beta_9 manager\ tenure_{9i} + \beta_{10} stock\ holdings_{10i} + \beta_{11} equity\ allocation_{11i} + \beta_{12} top10holdings_{12i} + \beta_{13} overall\ rating_{13i} + \beta_{14} environmental\ risk\ score_{14i} + \beta_{15} social\ risk\ score_{15i} + \beta_{16} governance\ risk\ score_{16i} + \beta_{17} style\ profile_{17i} + yield\ profile_{18} x_{18i} + \beta_{19} momentum\ profile_{19i} + \beta_{20} quality\ profile_{20i} + \beta_{21} volatility\ profile_{21i} + \beta_{22} liquidity\ profile_{22i} + \beta_{23} size\ profile + \varepsilon_i$	(6)
Bivariate Regression	
$Return_{it} = \beta_0 + \beta_1\ SFDR_{it} + \varepsilon_{it}$	(7)
$Return_{it} = \beta_0 + \beta_1\ Art\ 9_{it} + \beta_2\ Art\ 8_{it} + \varepsilon_{it}$	(8)
$Flow_{it} = \beta_0 + \beta_1\ SFDR_{it} + \varepsilon_{it}$	(9)
$Flow_{it} = \beta_0 + \beta_1\ Art\ 9_{it} + \beta_2\ Art\ 8_{it} + \varepsilon_{it}$	(10)
$ESG\ Rating_{it} = \beta_0 + \beta_1\ SFDR_{it} + \varepsilon_{it}$	(11)
$ESG\ Rating_{it} = \beta_0 + \beta_1\ Art\ 9_{it} + \beta_2\ Art\ 8_{it} + \varepsilon_{it}$	(12)
Multivariate Regression	
$Return_{it} = \beta_0 + \beta_1\ SFDR_{it} + \beta_2\ age_{it} + \beta_3\ size_{it} + \beta_4\ expenses_{it} + \beta_5\ SD_{it} + \beta_6\ R^2{}_{it} + \varepsilon_{it}$	(13)
$Return_{it} = \beta_0 + \beta_1\ Art\ 9_{it} + \beta_2\ Art\ 8_{it} + \beta_3\ age_{it} + \beta_4\ size_{it} + \beta_5\ expenses_{it} + \beta_6\ SD_{it} + \beta_7\ R^2{}_{it} + \varepsilon_{it}$	(14)
$Flow_{it} = \beta_0 + \beta_1\ SFDR_{it} + \beta_2\ age_{it} + \beta_3\ size_{it} + \beta_4\ expenses_{it} + \beta_5\ SD_{it} + \beta_6\ R^2{}_{it} + \varepsilon_{it}$	(15)
$Flow_{it} = \beta_0 + \beta_1\ Art\ 9_{it} + \beta_2\ Art\ 8_{it} + \beta_3\ age_{it} + \beta_4\ size_{it} + \beta_5\ expenses_{it} + \beta_6\ SD_{it} + \beta_7\ R^2{}_{it} + \varepsilon_{it}$	(16)
$ESG\ Rating_{it} = \beta_0 + \beta_1\ SFDR_{it} + \beta_2\ age_{it} + \beta_3\ size_{it} + \beta_4\ expenses_{it} + \beta_5\ SD_{it} + \beta_6\ R^2{}_{it} + \varepsilon_{it}$	(17)
$ESG\ Rating_{it} = \beta_0 + \beta_1\ Art\ 9_{it} + \beta_2\ Art\ 8_{it} + \beta_3\ age_{it} + \beta_4\ size_{it} + \beta_5\ expenses_{it} + \beta_6\ SD_{it} + \beta_7\ R^2{}_{it} + \varepsilon_{it}$	(18)

Table 13. Logit Regression

SFDR Disclosure	Odds Ratio	Standard Error	Z-Value	P-Value
Return (%)	1.017	.011	1.57	.116
Flow (USD billion)	2.711**	1.144	2.36	.018
ESG Rating	1.467***	.128	4.38	.000
Fund Age (years)	.981*	.01	-1.91	.056
Fund Size (USD billion)	1.216**	.107	2.21	.027
Net Expense Ratio (%)	.931	.079	-0.85	.398
R^2 (%)	1.008	.007	1.14	.252
Standard Deviation (%)	1.048*	.028	1.76	.078
Average Manager Tenure (years)	.98	.016	-1.24	.215
Stock Holdings (#)	.99**	0.002	-2.31	.021
Net Asset Allocation to Equity (%)	1.024	.026	0.91	.361
Assets in Top 10 Holdings (%)	.984***	.005	-3.25	.001
Overall Rating	1.144	.101	1.53	.125
Environmental Risk Score	.944	.058	-0.94	.348
Social Risk Score	.822**	.08	-2.01	.044
Governance Risk Score	1.416**	.195	2.52	.012
Style Profile	.985**	.007	-1.99	.046
Yield Profile	.991	.007	-1.33	.182
Momentum Profile	1.006*	.004	1.71	.087
Quality Profile	.995	.004	-1.15	.251
Volatility Profile	1.005	.005	0.87	.383
Liquidity Profile	1.004	.004	1.02	.306
Size Profile	.993	.005	-1.21	.224
Observations	751			
Pseudo R^2	0.111			

Table 14. Bivariate Regression

	Return		Flow		ESG Rating	
	(1)	(2)	(3)	(4)	(5)	(6)
SFDR disclosure	.559		.037***		.471***	
	(.709)		(.014)		(.068)	
Article 8		.673		.027**		.447***
		(.727)		(.014)		(.069)
Article 9		-.646		.137***		.734***
		(1.841)		(.035)		(.174)
Observations	1036	1036	1036	1036	968	986
R^2	0.0006	0.0011	0.007	0.016	0.048	0.049

Standard errors in parentheses
*** *p<.01, ** p<.05, * p<.1*

Columns (1), (3), (5) run the regression against overall SFDR disclosure, while columns (2), (4), (6) show the incremental effect of Article 8 and 9 disclosures. The constant term is included but not reported.

Table 15. Multivariate Regression

	Return		Flow		ESG Rating	
	(1)	(2)	(3)	(4)	(5)	(6)
SFDR Disclosure	.3		.026*		.468***	
	(.669)		(.014)		(.067)	
Article 8		.386		.017		.444***
		(.685)		(.014)		(.068)
Article 9		-.65		.121***		.731***
		(1.726)		(.035)		(.172)
Fund Age (yrs.)	.012	.013	-.002*	-.002**	.002	.002
	(.04)	(.04)	(.001)	(.001)	(.004)	(.004)
Fund Size (USD billion)	-.245	-.234	.031***	.03***	.016	.013
	(.28)	(.281)	(.006)	(.006)	(.027)	(.027)
Expense Ratio (%)	.072	.062	.015**	.016**	.027	.03
	(.368)	(.368)	(.007)	(.007)	(.036)	(.036)
R^2 (%)	.113***	.113***	.0004	.0004	-.017***	-.018***
	(.025)	(.025)	(.001)	(.0005)	(.002)	(.002)
Standard Deviation (%)	-.437***	-.436***	-.001	-.001	-.011	-.011
	(.083)	(.083)	(.002)	(.002)	(.009)	(.009)
Observations	1025	1025	1025	1025	958	958
Adjusted R^2	.06	.06	.035	.042	.094	.095

Standard errors are in parentheses
*** *p<.01, ** p<.05, * p<.1*

Columns (1), (3), (5) run the regression against overall SFDR disclosure, while columns (2), (4), (6) show the incremental effect of Article 8 and 9 disclosures. The constant term is included but not reported.

APPENDIX G. ROBUSTNESS

Table 16. Multivariate Regression – Alternative Return Measure

	Return		Alpha	
	(1)	(2)	(3)	(4)
SFDR Disclosure	.3		.137	
	(.669)		(.703)	
Article 8		.386		.242
		(.685)		(.719)
Article 9		-.65		-1.032
		(1.726)		(1.813)
Fund Age (years)	.012	.013	.022	.023
	(.04)	(.04)	(.042)	(.042)
Fund Size (USD billion)	-.245	-.234	-.222	-.208
	(.28)	(.281)	(.294)	(.295)
Expense Ratio (%)	.072	.062	.098	.085
	(.368)	(.368)	(.386)	(.387)
R^2 (%)	.113***	.113***	-.078***	-.077***
	(.025)	(.025)	(.026)	(.026)
Standard Deviation (%)	-.437***	-.436***	-.759***	-.758***
	(.083)	(.083)	(.087)	(.087)
Observations	1025	1025	1025	1025
Adjusted R^2	.06	.06	.065	.065

Standard errors are in parentheses

**** p<.01, ** p<.05, * p<.1*

Columns (1) and (2) show effects on raw returns, first from overall SFDR disclosure and then from Article 8 and 9 classifications. Columns (3) and (4) show effects on alpha, first from overall SFDR disclosure and then from Article 8 and 9 classifications.

Table 17. Logit Regression – Additional Controls

SFDR Disclosure	Odds Ratio	Standard Error	Odds Ratio	Standard Error
	(1)	(2)	(3)	(4)
Return (%)	1.009	.008	1.017	.011
Flow (USD billion)	2.484**	1.063	2.711**	1.144
ESG Rating	1.541***	.122	1.467***	.128
Fund Age (years)	.982*	.009	.981*	.01
Fund Size (USD billion)	1.273***	.115	1.216**	.107
Net Expense Ratio (%)	.973	.08	.931	.079
R^2 (%)	1.003	.006	1.008	.007
Standard Deviation (%)	1.007	.021	1.048*	.028
Stock Holdings (#)	1.001	.001	.99**	0.0002
Average Manager Tenure (years)	.981	.015	.98	.016
Overall Rating	1.15*	.097	1.144	.101
Style Profile	.996	.004	.985**	.007
Yield Profile			.991	.007
Momentum Profile			1.006*	.004
Quality Profile			.995	.004
Volatility Profile			1.005	.005
Liquidity Profile			1.004	.004
Size Profile			.993	.005
Environmental Risk Score			.944	.058
Social Risk Score			.822**	.08
Governance Risk Score			1.416**	.195
Assets in Top 10 Holdings (%)			.984***	.005
Net Asset Allocation to Equity (%)			1.024	.026
Observations	755		751	
Pseudo r-squared	0.078		0.111	
Akaike criterion (AIC)	987.994		970.608	

Columns (1) and (2) show the odds ratios and standard errors for a smaller set of explanatory variables. Columns (1) and (2) show the odds ratios and standard errors for an extended set of explanatory variables.

Table 18. Multivariate Regression for Return – Additional Controls

	Return			
	(1)	(2)	(3)	(4)
SFDR Disclosure	.3	1.248*		
	(.669)	(.733)		
Article 8			.386	1.219
			(.685)	(.746)
Article 9			-.65	1.598
			(1.726)	(1.787)
Fund Age (years)	.012	.047	.013	.046
	(.04)	(.044)	(.04)	(.044)
Fund Size (USD billion)	-.245	-.192	-.234	-.195
	(.28)	(.312)	(.281)	(.313)
Expense Ratio (%)	.072	-.359	.062	-.355
	(.368)	(.381)	(.368)	(.382)
R^2 (%)	.113***	.024	.113***	.024
	(.025)	(.029)	(.025)	(.029)
Standard Deviation (%)	-.437***	.011	-.436***	.011
	(.083)	(.098)	(.083)	(.098)
Stock Holdings (#)		.001		.001
		(.003)		(.003)
Average Manager Tenure (years)		.071		.071
		(.072)		(.072)
Overall Rating		.839**		.837**
		(.382)		(.383)
Style Profile		.173***		.173***
		(.017)		(.017)
Observations	1025	766	1025	766
Adjusted R^2	.06	.172	.06	.171

Standard errors are in parentheses

*** *p<.01, ** p<.05, * p<.1*

Columns (1) and (2) show the overall SFDR impact, first for the base model and then for the extended model with additional controls. Columns (3) and (4) show the impact of the Article 8 and 9 for the base and extended model.

Table 19. Multivariate Regression for Flow – Additional Controls

	Flow			
	(1)	(2)	(3)	(4)
SFDR Disclosure	.026*	.033**		
	(.014)	(.016)		
Article 8			.017	.023
			(.014)	(.016)
Article 9			.121***	.145***
			(.035)	(.038)
Fund Age (years)	-.002*	-.001	-.002**	-.001
	(.001)	(.001)	(.001)	(.001)
Fund Size (USD billion)	.031***	.007	.03***	.006
	(.006)	(.007)	(.006)	(.007)
Expense Ratio (%)	.015**	-.0003	.016**	.001
	(.007)	(.008)	(.007)	(.008)
R^2 (%)	.0004	.001	.0004	.001
	(.001)	(.001)	(.0005)	(.001)
Standard Deviation (%)	-.001	.002	-.001	.002
	(.002)	(.002)	(.002)	(.002)
Stock Holdings (#)		-.00007		-.00008
		(.00007)		(.00007)
Average Manager Tenure (years)		-.0002		-.0002
		(.002)		(.002)
Overall Rating		.022***		.021***
		(.008)		(.008)
Style Profile		.001		.001*
		(.0004)		(.0004)
Observations	1025	766	1025	766
Adjusted R^2	.035	.012	.042	.024

Standard errors are in parentheses

**** p<.01, ** p<.05, * p<.1*

Columns (1) and (2) show the overall SFDR impact, first for the base model and then for the extended model with additional controls. Columns (3) and (4) show the impact of the Article 8 and 9 for the base and extended model.

Table 20. Multivariate Regression for ESG Rating – Additional Controls

	ESG Rating			
	(1)	(2)	(3)	(4)
SFDR Disclosure	.468***	.425***		
	(.067)	(.074)		
Article 8			.444***	.41***
			(.068)	(.075)
Article 9			.731***	.603***
			(.172)	(.178)
Fund Age (years)	.002	.011**	.002	.011**
	(.004)	(.004)	(.004)	(.004)
Fund Size (USD billion)	.016	.008	.013	.006
	(.027)	(.031)	(.027)	(.031)
Expense Ratio (%)	.027	.029	.03	.031
	(.036)	(.038)	(.036)	(.038)
R^2 (%)	-.017***	-.013***	-.018***	-.013***
	(.002)	(.003)	(.002)	(.003)
Standard Deviation (%)	-.011	-.032***	-.011	-.032***
	(.009)	(.01)	(.009)	(.01)
Stock Holdings (#)		-.00003		-.00005
		(.0003)		(.0003)
Average Manager Tenure (years)		-.017**		-.017**
		(.007)		(.007)
Overall Rating		.178***		.177***
		(.038)		(.038)
Style Profile		-.007***		-.007***
		(.002)		(.002)
Observations	958	755	958	755
Adjusted R^2	.094	.179	.095	.179

Standard errors are in parentheses

*** *p<.01, ** p<.05, * p<.1*

Columns (1) and (2) show the overall SFDR impact, first for the base model and then for the extended model with additional controls. Columns (3) and (4) show the impact of the Article 8 and 9 for the base and extended model.

Table 21. Multivariate Regression for Return – Domicile Effects

Return	Denmark	
	(1)	(2)
SFDR Disclosure	4.459*	
	(2.527)	
Article 8		4.388*
		(2.548)
Article 9		7.68
		(6.905)
Fund Age (years)	-.087	-.081
	(.143)	(.145)
Fund Size (USD billion)	1.619	1.634
	(1.326)	(1.336)
Expense Ratio (%)	-3.653	-3.81
	(2.749)	(2.785)
R^2 (%)	.241*	.228*
	(.121)	(.125)
Standard Deviation (%)	-.42	-.451
	(.332)	(.34)
Observations	63	63
Adjusted R^2	.108	.096

Standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

Table 22. Multivariate Regression for Flow – Domicile Effects

Flow	France	Ireland		Luxembourg		Spain	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
SFDR Disclosure		.128**		.039*		.069*	
		(.055)		(.022)		(.037)	
Article 8	.029		.127**		.02		.069*
	(.024)		(.055)		(.022)		(.037)
Article 9	.085*		.167		.211***		
	(.046)		(.298)		(.049)		
Fund Age (years)	-.002*	-.003	-.003	-.001	-.0004	.003	.003
	(.001)	(.005)	(.005)	(.001)	(.001)	(.002)	(.002)
Fund Size (USD billion)	-.143***	-.001	-.001	.026***	.022**	.016	.016
	(.024)	(.018)	(.018)	(.009)	(.009)	(.085)	(.085)
Expense Ratio (%)	.001	.058	.058	.003	.004	-.027	-.027
	(.012)	(.046)	(.046)	(.012)	(.012)	(.041)	(.041)
R^2 (%)	-.002	.0004	.0004	.001	.001	-.002**	-.002**
	(.001)	(.002)	(.002)	(.001)	(.001)	(.001)	(.001)
Standard Deviation (%)	-.001	.006	.006	-.002	-.002	-.004	-.004
	(.004)	(.007)	(.007)	(.003)	(.003)	(.008)	(.008)
Observations	110	122	122	474	474	36	36
Adjusted R^2	.235	.027	.019	.021	.05	.096	.096

Standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

Table 23. Multivariate Regression for ESG Rating – Domicile Effects

ESG Rating	Denmark	France		Germany		Ireland	Luxembourg		Norway	Nordic
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
SFDR Disclosure		.457*		.811**		.321*	.544***			
		(.232)		(.336)		(.193)	(.097)			
Article 8	.328		.515**		.811**			.524***	.666	.106
	(.23)		(.237)		(.336)			(.099)	(.465)	(.16)
Article 9	2.921***		-.014					.722***	2.627***	1.246***
	(.628)		(.475)					(.217)	(.87)	(.373)
Fund Age (years)	-.011	.007	.008	-.003	-.003	.006	.0001	.0002	.005	-.005
	(.013)	(.012)	(.012)	(.017)	(.017)	(.018)	(.006)	(.006)	(.021)	(.009)
Fund Size (USD billion)	-.005	-.189	-.18	.013	.013	.094	.01	.006	-.912	.082
	(.121)	(.232)	(.232)	(.083)	(.083)	(.063)	(.038)	(.039)	(.665)	(.075)
Expense Ratio (%)	.005	-.053	-.065	-.284**	-.284**	.155	.029	.031	.577*	.106
	(.252)	(.117)	(.117)	(.14)	(.14)	(.163)	(.052)	(.052)	(.316)	(.092)
R^2 (%)	-.043***	-.014	-.012	-.032**	-.032**	-.021***	-.019***	-.019***	-.001	-.016***
	(.011)	(.013)	(.013)	(.015)	(.015)	(.007)	(.004)	(.004)	(.011)	(.004)
Standard Deviation (%)	-.108***	.071	.073	-.077	-.077	.0002	-.014	-.014	-.014	-.027
	(.032)	(.044)	(.044)	(.048)	(.048)	(.024)	(.012)	(.012)	(.072)	(.018)
Observations	62	95	95	57	57	117	451	451	24	163
Adjusted R^2	.358	.027	.03	.169	.169	.081	.1	.1	.193	.139

Standard errors are in parentheses

**** p<.01, ** p<.05, * p<.1*

APPENDIX H. INTERVIEWS

Table 24. List of Interview Partners

#	First Name	Last Name	Organization	Current Position
1	Christoffer	Gundersen	Argentum	Sustainability and Public Affairs Senior Associate
2	Jon Fredrik	Vassengen	Argentum	Manager
3	Lars Erik	Mangset	Grieg Investor	Head of Sustainable Finance
4	Linn Hege	Aune	Investinor	Head of Sustainability and ESG
5	Per Kristian	Gilleshammer	KLP	ESG Analyst
6	Marte	Storaker	ODIN Fund Management	Head of ESG
7	Sondre	Haugland	Skagen Funds	Head of ESG

Source: Own illustration

Table 25. List of Interview Questions

SFDR Adoption
1. Could you briefly summarize at which stage of the SFDR implementation you are? 2. What are main challenges in implementation? 3. Apart from the legal requirement, what are main motivations for adopting the SFDR?
SFDR Impact
4. How would you describe the magnitude of the effect the SFDR already had? 5. How does the SFDR impact investment strategies or fund selection processes? 6. How does the SFDR impact fund returns and fund flows? 7. How would you compare conventional, Article 8, and Article 9 funds in terms of returns and flows? 8. How do you expect level 2 disclosures to affect fund returns or fund flows? 9. Overall, where do you see the SFDR having the strongest effect?
Other
10. What could be reasons for Norway leading the adoption of the SFDR? 11. Which funds do you see as most likely to adopt the SFDR? 12. How do you evaluate the SFDR's effectiveness in reducing greenwashing?

Source: Own illustration