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Investors' Response to the Morningstar Sustainability Rating

Empirical Evidence from Scandinavian Mutual Funds

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Abstract

We examine the effect of the introduction of the Morningstar Sustainability Rating in March 2016 on mutual fund flows for Scandinavian funds. Making use of panel regressions and an event study, we find strong evidence that retail investors shift their money away from funds with high sustainability ratings to funds with low sustainability ratings. A low-rated fund receives on average a net flow per month 2.0 percentage points higher, and a high-rated fund suffers on average a net flow per month 1.2 percentage points lower than an average-rated fund during the first year after the launch of the rating. We find similar results in our sub-sample analyses on countries, fund sizes, and fund categories. In the event study, we find that inflow is more sensitive to the launch of the rating than outflow, as investors respond immediately by investing in the low-rated funds, while investors exit high-rated funds with lags.

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1 Introduction

In 2016, the number of assets professionally managed globally under responsible investment strategies reached $22.9 trillion, a 25% increase since 2014 (GSIA, 2016). Sustainable investments are gaining position in mainstream financial markets; this provides investors with a new decision-making criterion. As companies increase their interests in sustainable and responsible investing, it is important to determine if investors value sustainability. Some investors believe sustainability destroys shareholder value. Zhang (2006) finds that socially responsible funds in continental Europe and Asia-Pacific strongly underperform benchmark portfolios. Milton Friedman (1970) famously argues the following:

> *There is one and only one social responsibility of business – to use its resources and engage in activities designed to increase its profits so long as it stays within the rules of the game, which is to say, engages in open and free competition without deception or fraud.* [p. 6]

Other investors believe there is a long-term advantage of sustainability. Eccles et al. (2012) argues that sustainability creates shareholder value by attracting more skilled and loyal employees and loyal customers. They find that over a span of 18 years, high-sustainability companies on average deliver an excess return of 4.8% higher than low-sustainability companies, with lower volatility, when the companies are classified based on the adoption of environmental, social and governance (ESG) policies.

Riedl & Smeets (2017), on the other hand, find that investors engaged in socially responsible mutual funds expect lower returns on socially responsible funds than conventional funds and pay higher fees. Thus, they suggest that socially aware investors are willing to forgo financial gains to align their investments with their social preferences. Both social preferences and social signaling explain why investors hold socially responsible mutual funds.

In March 2016, the investment research company Morningstar launched a sustainability rating,

assessing more than 20,000 mutual fund's conformity to ESG issues. The simple rating between one (low conformity) and five (high conformity), illustrated by globes, is an easy way for investors to screen their investments on sustainability issues (Morningstar, 2016). As information on sustainability previously was restricted to institutional investors, the introduction of this rating is the first time such information is freely accessible and easy to grasp to all investors. Thus, the launch represents an exogenous shock to investors' investment decisions. The shock covered about 40% of the NYSE market value, while it at the same time did not affect the fundamentals (Hartzmark & Sussman, 2018). The publication, therefore, opens up a unique opportunity to study the effect of the launch of the Morningstar Sustainability Rating on the net fund flows of the rated funds and see if the investors value this information.

Several studies find indirect evidence that investors value sustainability. We examine the effect of the introduction of the Morningstar Sustainability Rating on fund flows in Scandinavia and thus provide a more causal approach. We limit our scope to share classes open to retail investors and not funds exclusive to institutional investors, as information on sustainability has been available to institutional investors prior to the launch of the sustainability rating. Moreover, institutional investors use more sophisticated screening criteria to evaluate sustainability. We also look at the difference in the net fund flows to mutual funds from Scandinavian countries and shed some light on differences within fund sizes and fund types. Our analysis shows that retail investors shift their money away from funds with a high sustainability rating to funds with a low sustainability rating. A low-rated fund receives on average a net flow per month 2.0 percentage points higher than an average-rated fund during the first year after the publication of the rating. A high-rated fund, however, suffers on average a net flow per month 1.2 percentage points lower than an average rated fund in the same period.

2 Literature Review

Many studies examine sustainable and socially responsible funds' financial performance (Renneboog et al., 2008). However, not as many studies examine investor preferences regarding sustainable investing and the cash flow effect of information on this non-financial attribute. Døskeland & Pedersen (2016) find that wealth framing is more efficient than morality framing regarding investors' decisions when investing responsibly. They conduct a field experiment on Norwegian investors in an online bank setting, where they frame responsible investments with a focus on either wealth or morality and study investors' behavior. They conclude that wealth is more important than morality, although moral concerns remain important.

Riedl & Smeets (2017) find that investors who expect socially responsible funds to underperform compared to conventional funds are less likely to invest in socially responsible funds. However, most investors that are engaged in socially responsible funds expect to earn lower returns and pay higher fees on socially responsible funds than conventional funds. Thus, they argue that socially aware investors are willing to forgo financial returns in order to invest consistently with their social preferences. They also argue that socially responsible investors might affect asset prices by driving up prices of socially responsible companies and driving down prices of sin companies as socially responsible investing continues to grow. When financial motives play less of a role in the investment decisions both social signaling and social preferences can explain why investors hold socially responsible mutual funds.

Ammann et al. (2018) study the impact of the Morningstar Sustainability Rating on U.S. equity mutual fund flows. Making use of panel regressions, propensity score matching, and an event study, they find clear evidence that retail investors shift away from mutual funds with low sustainability ratings to funds with high sustainability ratings. They argue that retail investors especially value information on sustainability. An average high-rated fund receives between \$4.1m and \$10.1m higher net flows than an average-rated fund, while an average low-rated fund suffers from \$1m to \$5m lower net flows than an average-rated fund during the first year after the publication of the rating. This is consistent with the findings of Hartzmark & Sussman (2018), who also conclude that low-rated funds suffer from net outflows of \$12-15billion in total, while high-rated funds receive net inflows of \$24-\$32 billion in total, for U.S. equity mutual funds over 11 months after the rating. By launching the sustainability rating, Morningstar made information available that previously was hard to obtain, available and easy to understand for

retail investors. Making the rating easy and understandable for retail investors is important, as Khorana & Servaes (2012) find that a higher Morningstar Star Rating has a positive effect on fund flows, even after controlling for more sophisticated performance measures such as abnormal returns, and therefore argue that investors prefer to pay attention to simple metrics. When the rating was released, and throughout the year, the number of Google searches for "Morningstar Sustainability Rating" was almost as popular as the well-known "Morningstar Star Rating" (Ammann et al., 2018). This indicates that investors use information on sustainability as a part of their decision-making process.

We contribute to the existing literature by investigating if investors in the Scandinavian countries value sustainability and whether there are differences by fund categories, fund size, and countries.

3 Data

3.1 Method for Data Collection

The data source for the thesis is Morningstar Direct, Morningstar's database for mutual funds. More than 98% of the funds in the database send their portfolio information directly to Morningstar on a monthly or quarterly basis. Morningstar then views, edits, and updates the data and runs quality assurance tests at multiple stages in the collection period. Morningstar corrects any irregularities and errors before the data is published in the database (Morningstar, 2018f).

In addition to monthly data on net fund flows and the Sustainability Rating, we collect other control variables to isolate the effect of the rating. However, not all the necessary data is accessible through a single data source as Morningstar operates with two solutions: Morningstar Direct Cloud and Morningstar Direct Desktop. Historical Star Rating, fund size (total net assets), and estimated net fund flows are collected from the Morningstar Direct desktop, while the historical Sustainability Rating, inception date, net expense ratio, monthly return, and standard deviation are retrieved from the Morningstar Direct Cloud. We collect all data in USD in order to easily compare the funds across the different currencies. After that, we combine the datasets in Excel. We lose some observations since Morningstar Direct Desktop and Morningstar Direct Cloud produce somewhat different lists of mutual funds, given the same search criteria.

We only collect data on funds open to retail investors, not funds exclusive to institutional investors. The reason for this is that institutional investors screen on several other aspects when judging a funds sustainability than the Morningstar Sustainability Rating. The rating is more trivial and aimed at retail investors, and we, therefore, expect that the institutional investors will have no significant reaction to the launch of the rating. Furthermore, institutional investors already had ESG information available through other channels prior to the launch. However, we include funds open for both institutional and retail investors in order to see if these funds' net flow is more affected by the retail or institutional investors. Funds open to both investor types are hereafter referred to as institutional funds.

3.2 Panel Data

The dataset is panel data, where we track each distinct fund over the whole period and see the effect of the Morningstar Sustainability Rating on the funds' relative net flow. Moreover, we group and analyze different sub-samples of our dataset and examine changes across time and between funds.

The panel data is structured on a monthly basis from September 2015 to March 2017 and contains 61,009 observations on 3,211 funds. There are many monthly observations and distinct funds, and therefore no issues with a short or long panel dataset structure. Since we observe the same funds each period, the panel data is a fixed panel (Greene, 2008). However, as we allow for dead funds to avoid survivorship bias, some of the funds go missing during the period. Therefore, the dataset can be considered to be a rotating panel. Even though we might lose some funds during the analysis, no new funds are added in the same period as we discard funds with less than two years of a track record. Thus, the dataset is not a truly rotating one.

There are a lot of missing observations in the dataset due to dead funds and unreported information, which leaves the dataset unbalanced. However, an unbalanced panel dataset is not problematic as long as the reason for the missing observations is uncorrelated with the error term (Wooldridge, 2016). Fund companies tend to liquidate poor-performing funds or merge them with better-performing funds, which allows them to keep their clients' money and mask poor performance (Rawson, 2014). This might cause upward-biased performance measures in our dataset. However, as our dependent variable is net flow, not a performance measure, we assume that this will not cause biased results in our analysis.

3.3 Variable Definitions

3.3.1 Control Variables

In addition to the dependent variable, monthly relative net fund flow, and the Sustainability Rating, we include other control variables proven to influence fund flows by previous flow literature (Khorana & Servaes (2012) and Ammann et al. (2018)). We include fund size, expense ratio, the age of the fund, volatility, and performance measures. The performance measures are monthly raw returns, one-year alpha, and the Star Rating (the Morningstar Overall Rating) which measures risk-adjusted, long-term performance. Thus, we cover short-, medium- and long-term performance.

3.3.2 Net Flow

Net fund flow is the dependent variable in the analysis and is calculated as the growth in total net assets excluding the reinvested returns in a month divided by the fund size at the end of the prior month:

$$NetFlow_{i,t} = \frac{TNA_{i,t} - TNA_{i,t-1} * (1 + Return_{i,t})}{TNA_{i,t-1}} \tag{1}$$

Where $TNA_{i,t}$ is the total net assets of fund i at the end of month t, and $Return_{i,t}$ is the return of the fund for the same month. Expenses have been accounted for in the net flow since both TNA and monthly return is calculated after expenses (Morningstar, 2018b). The net flow is the monthly relative net flow to each funds' share class, hereafter referred to as net flow.

As we do not have data on actual inflows and outflows, we analyze the synthetically derived flow measure. Given by Equation (1), we assume that all new money flows at the end of month t, which is the most commonly used measure in the flow literature (Ber & Ruenzi, 2006). Ber & Ruenzi (2006) compare this synthetic measure to actual measures of mutual funds and conclude that the synthetic measure serves as a good proxy for actual net flow. Their results indicate that the correlation between the synthetic flow measure and actual flow is approximately 93%. Thus, we argue that our flow measure is a good indicator of the actual flow.

3.3.3 The Morningstar Sustainability Rating

The Morningstar Sustainability Rating is a measure of how well the underlying assets of a mutual fund manage ESG risks and opportunities, relative to similar mutual funds. The research company Sustainalytics deliver the company-level ESG data used to compute the rating. At least 50% of the assets under management must be assigned a company-level ESG score from Sustainalytics, to receive a Sustainability Rating from Morningstar. Moreover, in order for a fund to receive a Sustainability Rating, at least 10 of the funds in its category must have portfolio sustainability scores. Of all the funds in our sample, with and without a Sustainability Rating, the average percentage of assets under management with a company-level ESG score is 67.2%, as of August 2018. Excluding funds without a Sustainability Rating, the average percentage of assets under management with a company-level ESG score is 87.4%. Morningstar does not provide historical figures on assets under management with company-level ESG scores.

The calculation of the Sustainability Rating is a two-step process. Firstly, Morningstar computes the Portfolio Sustainability Score, which is an asset-weighted average of a portfolio's normalized ESG score on a company level. Morningstar also deducts the score of any controversies that may occur on a company-level, like if a company in the portfolio is involved in a major emissions scandal, e.g., the Volkswagen scandal of 2015 (The New York Times, 2015). The research company normalizes the score to make it comparable across industries. Moreover, Morningstar sorts the funds in five normally distributed groups, by comparing the fund's Sustainability Score with its competitors within the same category. The categories are defined by Morningstar and represents the fund's actual investment style, not merely their stated investment objectives, e.g., Global Equity Large Cap, Healthcare Sector Equity, Europe Fixed Income, etc. The funds are allocated on the basis of their portfolio holdings. Thereafter, the lowest 10% receive one globe, the next 22.5% receive two globes, the next 35% receive three globes, the next 22.5% receive four globes, and finally the top 10% receive five globes (Morningstar, 2016). See Figure 1 in the appendix for an illustration of the rating.

3.3.4 The Morningstar Star Rating

The Morningstar Star Rating is a widely known performance measure, which we include to control for long-term performance. Del Guercio et al. (2007) find that changes in the Star Rating have an effect on fund flows, besides the effect of abnormal returns. Morningstar rates

mutual funds from one to five stars based on past performance (adjusted for risk and sales charges) compared to similar funds. Within each Morningstar Category, the top 10% of funds receive five stars, the next 22.5% receives four stars, the next 35% receives three stars, the next 22.5% receives two stars, and finally, the bottom 10% receives one star. Morningstar rates the funds on three time periods–three, five, and ten years–and these are combined to an overall rating (Morningstar, 2018e). No funds with less than three years of history are rated, and the rating is, therefore, a good measure for long-term performance.

3.3.5 Fund Size

The fund size variable is the total net assets to the fund's share class. The total net assets to each share class is the total assets at the end of the month, net of fees and expenses (Morningstar, 2018d). The variable is displayed on a monthly basis as the logarithm of the fund's total net assets due to the non-linear relationship between fund size and net flow and is included to control for the fund's size and the economies of scale effect on net flow (Khorana & Servaes, 2012).

3.3.6 Monthly Return

We include the monthly return variable to control for short-term performance, measured as the fund's total monthly raw returns. It is the change in price, reinvesting, and if applicable, all income and capital gains distributions during the period, divided by the starting price. In the return calculation, Morningstar accounts for the expense ratio but not for sales charges (Morningstar, 2018h). The return is presented in percentage terms and calculated by Morningstar.

3.3.7 Alpha

Alpha is the difference between a fund's actual return and its expected performance, given its level of risk as measured by the fund's beta. The beta is calculated by comparing a fund's excess return over Treasury bills to the market's excess return over Treasury bills and assigned to the funds by Morningstar (Morningstar, 2018a). We include the alpha to control for medium-term performance. It is based on the Morningstar Primary Risk-Free Rate and the Morningstar Category Primary Benchmark. It is annualized and calculated for the last 12-month period. The alpha is displayed on a monthly basis as the 12-month rolling alpha.

3.3.8 Standard Deviation

We include the fund's standard deviation to control for the fund's return volatility. The standard deviation is the average dispersion of a fund's return over a certain period (Morningstar, 2018g). It is annualized and calculated for the last 12-month period. The variable is displayed on a monthly basis as the 12-months rolling standard deviation.

3.3.9 Net Expense Ratio

The net expense ratio is the annual net expense ratio, which is the percentage of assets deducted each year for management fees, 12b-1 fees, operating costs, and other administrative fees (Morningstar, 2018c). Morningstar excludes interest and dividend expenses in order to provide a clearer comparison of expense ratios. It also accounts for fee waivers in effect during the period. We assume the net expense ratio to be constant throughout the year. We include the net expense ratio to control for the fund's net expenses. The net expense ratio is hereafter referred to as the expense ratio.

3.3.10 Fund Age

Fund age is the number of years the fund has operated and has been available to be traded. We define the fund's age as the inception date of the fund until September 2015. We choose September 2015 as this is the first month of data on the sustainability rating. We exclude all funds with ages lower than 1.5 years from this point (2 years prior to the launch) because of a too short track record. Khorana & Servaes (2012) argues that the number of years since inception is a good indicator of fund management experience.

3.4 Processing of the Dataset

The data is at the share class level on all retail mutual funds with base currency in NOK, SEK or DKK. However, as fund flows of different share classes may not be closely related, we hereby treat and refer to each share class of a fund as separate funds, as suggested by Ammann et al. (2018).

Table 1: Reduction in Sample Size

Table 1 shows how the original dataset, containing all retail funds in NOK, SEK and DKK from September 2015 to March 2017, have been reduced to our final sample size.

	Reduction		Sample	
	Funds	Observations	Funds	Observations
All open-end mutual funds in NOK, SEK, and DKK	-	-	3,211	61,009
Top and bottom percentile of net flow removed	1,237	23,503	1,974	37,506
Fund age < 1.5 removed	848	16,112	1,126	21,394
Fund size $<$ \$ 1 000 000 removed	60	1,140	1,066	20,254
Institutional investors removed	319	6,061	747	14,193
Final sample			747	14,193

As we see in Table 1, the number of observations has been drastically reduced during the processing of the dataset. To mitigate the influence of outliers, we winsorize the top and bottom one percentile of fund flows from the analysis. Most observations are lost here due to many dead and new funds with missing variables, and we are left with 37,506 observations of monthly fund data. When winsorizing on the top and bottom percentile of net flow, all missing observations on the net flow variable are also deleted, thereby removing all missing and extreme observations. Several funds and observations are also lost when removing the small, fund size under one million USD, and inexperienced funds, track record under two years. The final set, containing observations from September 2015 to March 2017 for retail investors, has 14,193 observations on 747 distinct funds. All control variables are lagged by one month, except for the fund age variable, to incorporate investors' response to these variables, expressed through net flows the next month. The dataset is also split by investor types into two sub-samples: retail and institutional investors. We define institutional investors as investors investing in fund open for both retail and institutional investors.

3.5 Characteristics of the Dataset

3.5.1 Fixed Effects

There can be challenges with fixed effects in panel data (Wooldridge, 2016). The dataset might contain monthly and fund specific fixed effects. In order to confirm the need for fund- and month-specific fixed effects, we conduct F-tests for group-wise significance. Both tests confirm that fixed effects are needed. We conduct a Hausman test to see whether fixed or random effects is best suited for the model. We reject the null hypothesis of no systematic difference in the

coefficients at the one-percent level and conclude that fixed effects are best suited for the model.

We control for the monthly fixed effects by adding n-1 monthly dummies to our regression. We account for the fund style fixed effects for by clustering the standard errors on both fund level and period to control for fund specific fixed effects based on entity and time.

3.5.2 Heteroskedasticity, Autocorrelation, Skewness and Kurtosis

We conduct a modified Wald test for group-wise heteroscedasticity in order to check for heteroscedasticity. We reject the null hypothesis of homoscedasticity at the at the one-percent level and conclude that heteroscedasticity is a potential problem in the model. We account for heteroscedasticity by clustering the standard errors, thereby making them robust (Hoechle, 2007).

We also check for autocorrelation since autocorrelation can, as heteroscedasticity, lead to bias results when testing the hypothesis. Firstly, we test for correlation between the different variables by making a correlation table. The results from that test indicate that the correlation between the explanatory variables is not a problem. To test for autocorrelation, we conduct a Wooldridge test for autocorrelation in panel data. We reject the null hypothesis of no first-order autocorrelation at the 5% level, and we conclude that there is autocorrelation in our dataset. To account for the autocorrelation, we cluster the standard errors on fund level and month to add robust standard errors, which gives a common correlation within in each group (Cameron & Miller, 2013). Lastly, we also check for skewness and kurtosis by performing a skewness test. We find no evidence of skewness or kurtosis in the dataset.

4 Evaluation of the Data Material

4.1 Validation of the Dataset

Having a high-quality dataset is important to have a reliable analysis. To evaluate the quality and relevance, we investigate the dataset's validity and reliability (Saunders et al., 2009). Validity is how relevant and well-suited the dataset is to test the hypothesis (Saunders et al., 2009). In the method literature, internal, external, statistical, and construct validity are used to explain the validity of the data (Selnes, 1999).

4.1.1 Internal Validity

Internal validity is the to which extent causality exists between two variables (Selnes, 1999). Internal validity is if there exist explanations for the observed connection between two variables other than those included in the analysis.

The data is gathered by Morningstar to give investors insight into performance and other relevant attributes of mutual funds. Thus, Morningstar collects the data for the same purpose as our analysis, which speaks to strong internal validity. In addition, several studies have also used data from Morningstar to examine the Morningstar ratings' effect on fund flows (e.g. see Ammann et al. (2018), Hartzmark & Sussman (2018), and Del Guercio et al. (2007)).

On the other hand, there are many missing observations in the dataset, which can lead to weaker internal validity. However, as seen under statistical validity, we still have more than enough observations to draw statistically valid conclusions. Overall, we argue that the dataset has high internal validity.

4.1.2 External Validity

External validity is the to which extent the research results can be generalized (Saunders et al., 2009), in other words, if the results of the analysis can be representative for other investors not included in the research.

We perform the study on mutual funds in the Scandinavian countries of Norway, Sweden and Denmark. However, the Morningstar assigns the Sustainability Rating to mutual funds world-

wide. Assuming that every investor is rational and invests according to similar utility functions, the results can be generalized to investors in other parts of the world. However, there are several cultural and individual differences between investors. Levitt & List (2007) argues that investors have different utility functions and therefore invest differently based on their own beliefs. The results should therefore not be generalized uncritically to other countries. However, neighboring countries often share a similar history and culture. We could, therefore, expect to find more similar results between our countries (Norway, Sweden, and Denmark) than for other countries.

To investigate differences in investor behavior between countries we assume that the majority of investors place holdings in their base currency (Hasan & Simaan, 2000). The investor behavior observed is based on investors from all across the country and not a specific group from one region. It will, therefore, represent the population in a good manner and be generalizable for the rest of the country's population as a whole.

We are not able to capture investor-specific attributes since we cannot track the investors on an individual level. We therefore miss out on many sub-sample analyses. With more personal data it would be possible to study how the retail investors' investment styles differentiate based on their investment scope, experience (amateur or professional), investments sizes, gender differences, and age.

4.1.3 Statistical Validity

Statistical validity indicates the degree to which there is a statistical basis to draw conclusions (Selnes, 1999). The statistical validity and certainty increase by increasing the number of observations.

Initially, the dataset contains 61,009 observations, where each observation is monthly data on variables for a given fund. As we see in Table 1, the number of observations has been drastically reduced during the processing of the dataset. The final sample, containing observations from September 2015 to March 2017, has 14,193 observations on 747 distinct funds. The selection is considered to be large enough to draw statistically valid conclusions (Mordkoff, 2000). Nevertheless, the sample could benefit from more observations. It can, therefore, be some statistical uncertainty in our results.

4.1.4 Construct Validity

Construct validity occurs if the analysis measures what we aim to measure (Selnes, 1999). An important prerequisite for construct validity is that the observations are reliable, which we will discuss further under Section 4.2

We examine the relationship between a fund's monthly relative net flow and sustainability rating and control for other variables known to affect net flow. We have good measurements on all these variables and can, therefore, capture the effect of the Morningstar Sustainability Rating in a reasonable manner.

In the event study, we aim to find the initial shock of the publication of the Morningstar Sustainability Rating. We measure the same variables as before which speaks for good construct validity. In the study, we predict the net flow for all the rated funds the first six months after the launch and compare them to their observed flow. By using predicted values, the construct validity might be weakened, but the event study method is an acknowledged method used by several researchers, including Ammann et al. (2018), who use this method to test the same effect. We can, therefore, conclude that the construct validity for the event study and the analysis overall is good.

4.2 Reliability of the Dataset

Reliability tells us whether or not we can trust our dataset (Johannessen et al., 2011). Reliability is a measure of consistency, stability, and accuracy, where the most important warranty for good reliability is that the data is collected in a reliable manner.

We base the analysis on fund data from Morningstar Direct, which ensures high reliability since this information is securely registered each month (Morningstar, 2018f). We only collect data from one provider, which makes the collection method consistent, and we avoid any problems associated with assembling different data from several providers. Morningstar collects and validates this information for all funds on a monthly basis, and this secures that our information is correct and consistent.

The number of missing observations in our dataset might affect the reliability of the dataset. To account for the missing observations, we explore the possibility of using multiple imputations as a supplementary analysis. If the conditions for multiple imputations are fulfilled, regressions on

the imputed dataset will produce approximately the same results as if the dataset had no missing observations to begin with (UCLA, 2018). We perform imputation on the missing variables but as the proportion of missing data on the Sustainability Rating is substantial (for example, over 40%), the results may only be considered hypothesis generating results and therefore not reliable (Jakobsen et al., 2017). The missing observations for the Sustainability Rating is more than 60%, which could influence the reliability of the analysis with multiple imputations. The results can at best, by showing the same tendencies as our main analysis, substantiate our findings, but these results are not reliable on their own. We, therefore, discard using multiple imputations as a supplementary analysis.

Another element that can influence the reliability is that we assume that a fund is from the country that the fund's currency is based on and that people mostly invest in their own currency (Hasan & Simaan, 2000). Thereby, representing that country's investor behavior best. However, all investors have access and opportunity to invest in funds across the world. Foreign investors can invest in funds from other countries, just as domestic investors can buy foreign funds. This can result in losing many domestic investors and thereby influence the reliability of the results. Even though we are aware of this problem we cannot do anything about it since it is impossible for us to track all the investors in our funds. Therefore, we assume that the majority investing in a fund based in NOK are Norwegian; Swedish people invest in funds based in SEK, and Danish people invest in funds based in DKK. These country differences are further examined in a sub-sample analysis.

5 Summary Statistics

Table 2: Summary Statistics

Table 2 displays summary statistics for all funds in the post-publication period, from March 2016 to March 2017. Net flow, monthly return, standard deviation, expense ratio, and 12-month alpha is displayed in percentages. Fund size is shown in million dollars, the Sustainability Rating and the Star Rating are integers between one and five. Fund age is the number of years since the fund's inception date, as of September 2015. Observations is the total number of monthly observations for each variable.

	Obs.	Mean	Std. Dev	p25	Median	p75	Min	Max
Net flow (%)	11 782	0.5	8.3	-1.0	0.0	1.2	-45.4	102.9
Fund size ($m)	11 757	228	481	16	67	200	1	6000
Sustainability Rating	4 264	2.9	1.1	2	3	4	1	5
Star Rating	7 236	3.0	1.1	2	3	4	1	5
Monthly return (%)	11 735	1.0	3.7	-1.6	0.7	3.3	-15.0	23.4
Standard deviation (%)	11 729	13.6	4.2	10.4	12.6	15.8	4.5	40.5
Expense ratio (%)	7 984	1.2	0.9	0.5	1.1	1.7	0.1	15.3
12-months alpha (%)	7 517	0.4	5.8	-2.0	0.2	2.4	-40.2	37.5
Fund age in years	11 782	9.3	7.6	3.1	6.1	14.2	1.5	41.9

In Table 2, we examine summary statistics for the post-publication period, in the period of March 2016 to March 2017, since this is period where we perform most of our regressions. Even after excluding the upper and lower one percentage, the net flow is scattered with the highest observed monthly net flow of 102.9% and the lowest of -45.4%, with a mean of 0.4%. Note that we have few monthly observations of the Sustainability Rating and the Star Rating, compared to the other variables. For the Sustainability Rating, we only have observations on 36% of the fund-months in our dataset. This affects our analysis as we lose a lot of observations.

Table 3: Summary Statistics by Sustainability Rating

Table 3 displays the summary statistics by Sustainability Rating in sub-samples. Panel A examines the data in the six months prior to the publication of the rating, from September 2015 to March 2016. We retrieve data on the unpublished Sustainability Rating from Morningstar Direct. Panel B examines the data in the 12 months after the publication of the rating, from March 2016 to March 2017. Panel C displays the percentage and percentage points change in summary statistics from pre-publication period to the post-publication period (pp = percentage points).

Panel A: Pre-Publication

	Obs	Fund Size ($m)		Net Flow (%)		Monthly Return (%)		Fund Age		Star Rating		Alpha (%)	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
All	2151	259	75.6	1.1	0.0	0.5	-0.3	11.2	9.4	3.4	3	1	0.8
Sustainability Rating 1	289	257	80.3	1.3	0.1	0.9	0.2	9.1	5.6	3.5	4	4.8	5.0
Sustainability Rating 2	512	229	62.2	0.9	0.0	0.5	-0.3	11.6	7.9	3.3	3	2.2	2.0
Sustainability Rating 3	769	292	70.8	1.4	0.0	0.4	-0.2	11.7	9.9	3.4	3	0.6	0.3
Sustainability Rating 4	360	261	101.0	0.9	0.0	0.5	-0.3	10.9	10.0	3.3	3	-1.2	-0.9
Sustainability Rating 5	221	212	75.6	0.6	0.0	0.2	-1.1	11.9	10.1	3.1	3	-1.0	-0.4

Panel B: Post-Publication

	Obs	Fund Size ($m)		Net Flow (%)		Monthly Return (%)		Fund Age		Star Rating		Alpha (%)	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
All	4 264	275	81	0.7	0.0	1.4	1.1	10.8	9.0	3.3	3	0.8	0.1
Sustainability Rating 1	485	213	71	1.8	0.2	1.5	1.2	8.2	4.1	3.6	4	3.5	2.6
Sustainability Rating 2	1 075	226	62	0.9	0.0	1.3	1.1	10.8	8.2	3.1	3	1.9	1.6
Sustainability Rating 3	1 467	314	97	0.4	0.0	1.3	1.0	11.8	9.8	3.4	3	0.2	-0.3
Sustainability Rating 4	795	323	122	0.5	0.0	1.5	1.4	10.5	10.0	3.5	3	-0.1	0.0
Sustainability Rating 5	442	244	69	0.2	0.0	1.6	1.4	10.9	10.0	3.0	3	-0.5	-1.0

Panel C: Percentage Change from Pre-Publication to Post-Publication

	Fund Size (%)		Net Flow (pp)		Monthly Return (pp)		Fund Age (%)		Star Rating (%)		Alpha (pp)	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
All	6	8	-0.4	0.0	0.9	1.4	-4	-4	-3	0	-0.2	-0.7
Sustainability Rating 1	-17	-11	0.5	0.1	0.6	1.0	-10	-27	3	0	-1.3	-2.4
Sustainability Rating 2	-1	0	0.0	0.0	0.8	1.4	-7	4	-6	0	-0.3	-0.4
Sustainability Rating 3	8	37	-1.0	0.0	0.9	1.2	1	-1	0	0	-0.4	-0.6
Sustainability Rating 4	24	21	-0.4	0.0	1.0	1.7	-4	0	6	0	1.1	0.9
Sustainability Rating 5	15	-9	-0.4	0.0	1.4	2.5	-8	-1	-3	0	0.5	-0.6

Table 3 displays the summary statistics by the Sustainability Rating. In Panel A, we examine summary statistics by sustainability rating prior to the publication, from September 2015 to March 2016. We retrieve data on the unpublished Sustainability Rating from Morningstar's database. Funds with average sustainability rating tend to have larger fund size than high- and low-rated funds. This might be as the rating becomes less extreme for larger funds with more diverse holdings. Funds with low sustainability rating have on average higher net flow and higher monthly return than funds with a high rating. Also, the medium and long-term performance measures, one-year alpha and Star Rating, are on average higher for the funds with a low sustainability rating than the funds with a high sustainability rating.

In Panel B, we examine summary statistics by the sustainability rating after the publication, March 2016 to March 2017. Funds with a low sustainability rating receive on average higher net flow than the funds with a high sustainability rating. The average monthly return is roughly the same, but the average star rating is higher for the low-rated funds than the high-rated funds. The alpha is also higher for the low-rated funds. In Panel C, we examine the percentage change from the pre-publication to the post-publication period. We see that funds with a low sustainability rating on average experience approximately 0.5 percentage points higher net flow and 0.6 percentage points higher monthly return after the publication, compared to six months prior to the publication. Funds with high sustainability ratings suffer on average from a 0.4 percentage points lower net flow after the publication of the rating. They simultaneously increase their average monthly return by 1.4 percentage points.

Figure 1: Net Fund Flows by Sustainability Rating

This figure displays average net fund flows by sustainability rating for 6 months prior and 12 months after the launch of the rating in March 2016 (denoted by the dashed line). Low, average, and high sustainability represents a sustainability rating of 1, 3, and 5, respectively.

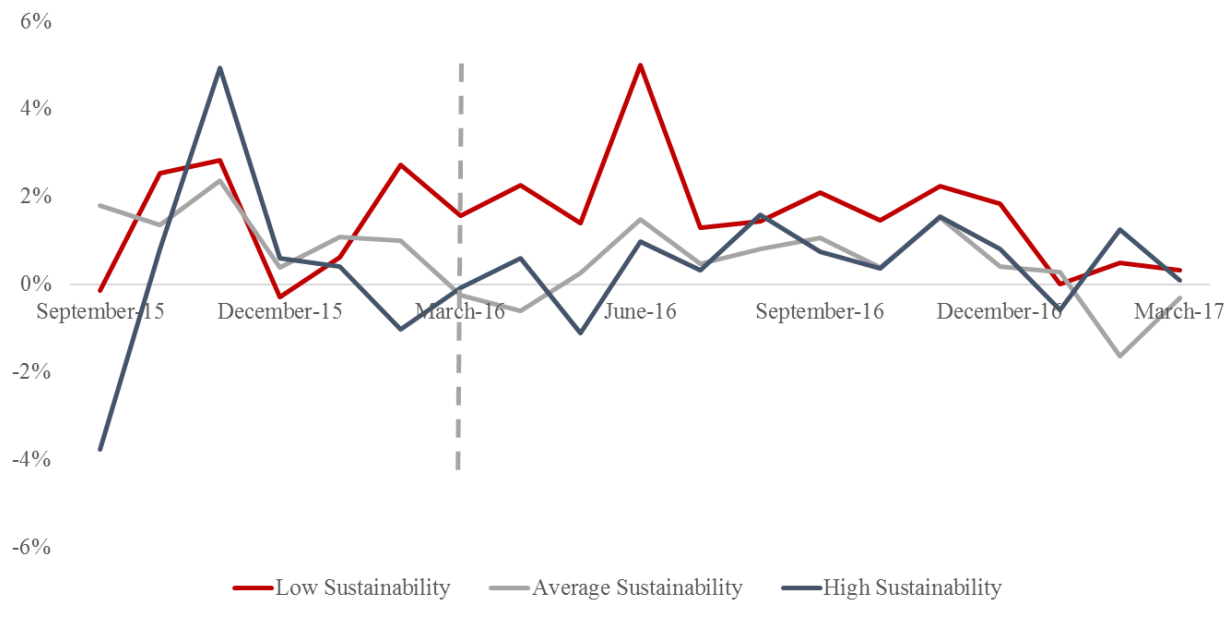
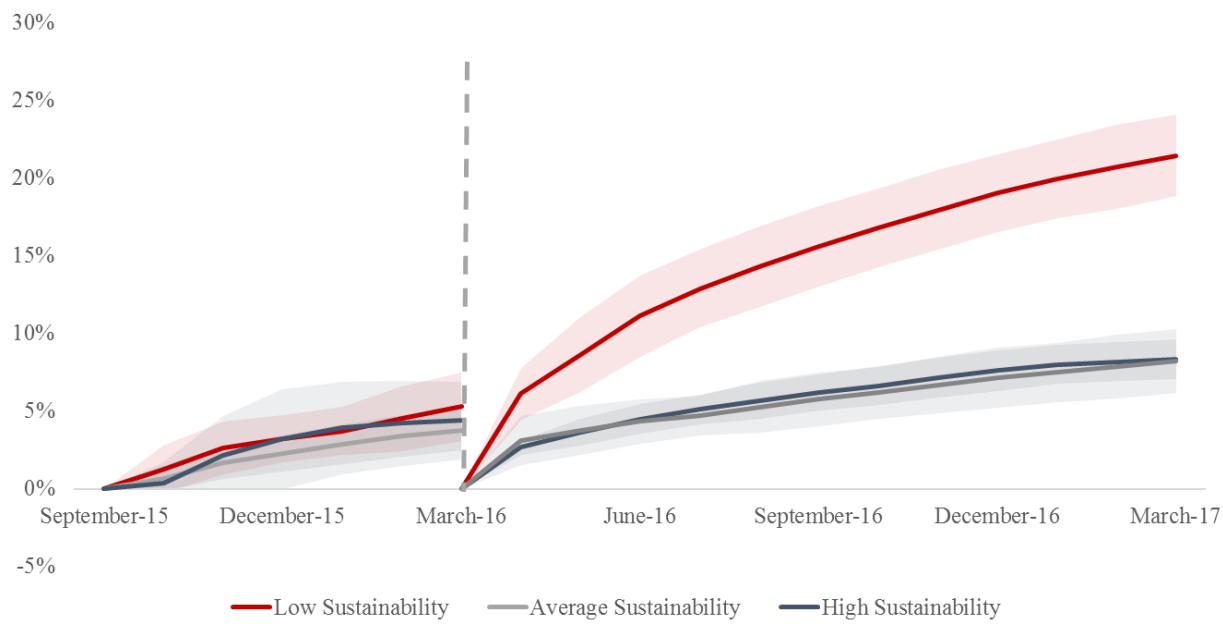


Figure 2: High Sustainability Rating Minus Low Sustainability Rating

This figure displays the difference in monthly net flow between high- and low-rated funds for September 2015 to March 2017.

Figure 3: Cumulative Net Fund Flows by Sustainability Rating

This figure displays the cumulative moving average of net fund flows by the Sustainability Rating for 6 months prior and 12 months after the launch of the rating in March 2016 (denoted by the dashed line). The shaded area represents 95% confidence interval. Low, average, and high sustainability represents a sustainability rating of 1, 3, and 5, respectively.



In Figure 1, we examine average monthly fund flows by the Sustainability Rating, before and after the publication of the rating. We find no apparent trend in net flows prior to the publication of the Sustainability Rating. After the publication of the rating, however, the average of net flows to funds with a low sustainability rating is mainly higher than funds with an average and a high sustainability rating. In Figure 2, we see this trend in net flow clearer. The figure displays the difference in net flow between high- and low-rated funds, and we see that the difference is negative for almost our entire period. This shows that it is constantly more money moving into the low-rated funds than the high-rated funds. This is in line with the main findings of our analysis, where funds with a low sustainability rating receive higher net flow than an average-rated fund and funds with a high sustainability rating suffers from lower net flow than an average-rated fund.

These findings become more evident in Figure 3, where we examine the cumulative moving average of fund flows by the sustainability rating, before and after the publication of the rating. We find no trend in fund flows prior to the publication of the sustainability rating, but the cumulative moving average of fund flows to funds with low sustainability rating is persistently higher than funds with average and high sustainability rating after the publication of the rat-

ing. This result is in contrast to the findings of Hartzmark & Sussman (2018) and Ammann et al. (2018) on the impact of the Morningstar Sustainability Rating on American open-end mutual funds. They provide evidence of investors shifting money away from funds with low sustainability ratings to funds with high sustainability ratings.

In the appendix Figures 5 and 6, we examine average monthly fund flows and cumulative moving averages of fund flow by star rating. Funds with high star ratings receive higher net flow than funds with low star ratings. These results are in line with the findings of our analysis and the findings of Del Guercio et al. (2007) and Khorana & Servaes (2012).

Table 4: Distinct Funds by Sustainability Rating and Interaction Terms

The first part of this table displays the number of distinct funds by sustainability rating per month. Distribution is each sustainability rating's share, on average, of the total number of funds with a sustainability rating in our sample. The second part displays the number of distinct funds with different combinations of Morningstar's Star Rating and Sustainablity Rating. The data is from March 2016 to March 2017.

	Distribution	Average	Median	Min	Max
Sustainability Rating					
Low	12 %	38.3	38	30	49
Below Average	25 %	82.1	83	71	92
Average	34 %	112.4	112	104	123
Above Average	18 %	59.0	59	46	75
High	11 %	34.8	35	25	42
Interaction Terms					
High Star Rating*High Sustainability Rating		1.8	2	0	4
High Star Rating*Low Sustainability Rating		6.0	6	4	8
Low Star Rating*High Sustainability Rating		1.0	1	0	2
Low Star Rating*Low Sustainability Rating		1.2	1	0	3

In Table 4, we examine distinct funds by the Sustainability Rating. Note that these are not monthly observations, but the number of funds. Our sample distribution is close to the normalized distribution Morningstar assigns each category, of 10%, 22.5%, 35%, 22.5%, and 10%, for sustainability rating 1-5, respectively. The interaction terms display the number of distinct funds with combinations of the star rating and the sustainability rating per month. Of the funds with both ratings, the majority have a high star rating and low sustainability rating. We have very few funds with both a high/low sustainability rating and a high/low star rating, due to a large portion of funds in our dataset without ratings, as seen in Table 2. In addition, of the funds with a rating, only 10% receive either a high or low rating. Because of this, there are few interactions between the most extreme ratings within the same fund.

Table 5: Fund Attributes by Sustainability Rating

This table displays the average number of unique funds by fund attributes and Sustainability Rating. The numbers presented is the average number of distinct funds per month in our period, March 2016 to March 2017. The size quintiles is determined by fund size. The 1st quintile is the smallest funds, and 5th quintile the largest.

	Sustainability Rating				
	Low	Below Average	Average	Above Average	High
Fund types					
Equity	24.1	53.3	83.3	46.6	24.5
Fixed income	1.2	4.9	7.0	2.2	1.2
Alternative	2.2	6.2	3.7	1.2	0.0
Country					
Norway	11.5	32.1	48.4	29.9	13.9
Sweden	17.0	35.2	47.2	20.5	13.8
Denmark	2.8	1.8	0.9	1.2	0.0
Size					
1st quintile	6.3	21.2	17.2	5.6	4.9
2nd quintile	5.5	13.7	18.8	11.2	6.1
3rd quintile	6.9	12.9	17.6	11.2	6.6
4th quintile	8.2	9.1	19.4	12.9	5.8
5th quintile	4.5	12.3	23.5	10.6	4.2

Table 5 displays the average number of unique funds by fund attributes and sustainability rating per month. For equity funds, there are on average 24.1 funds with a low sustainability rating each month. We see a clear difference in the number of observations for the different fund types and countries. The most observations are for equity funds, while there is roughly the same number of observations for fixed income and alternative funds. There are no alternative funds with a high sustainability rating in our period. Looking at the countries, Norway and Sweden have similar numbers for observations and distribution. Denmark however, has very few funds in the different ratings and no high-rated funds. There are few Danish funds because there are very few of them in the Morningstar database, and many are removed during the processing of the dataset due to missing observations. For the fund size quintiles, we see that the dispersion of funds per month is roughly the same and that there are several observations for each rating.

6 Empirical Results

6.1 Empirical Approach

In the following chapter, we discuss the method and approach employed in the analysis and show the results of the panel regressions and the event study.

6.2 Panel Regression Method and Results

6.2.1 Net Fund Flows in Response to the Sustainability Rating

The ideal way to study the effect of the Morningstar Sustainability Rating on net flow would be to compare a group of funds with a published Morningstar Sustainability Rating to comparable funds with identical non-published rating (Ammann et al., 2018). However, this is not possible as there are no comparable funds with unpublished ratings. Thus, we compare funds with different sustainability ratings.

Based on the dataset, its structure, and properties, we choose panel regression as the main research method of the analysis. Panel regression helps us determine if investors value sustainability through their flow response to the sustainability rating. We regress the monthly net flow on the fund's sustainability rating, star rating, monthly return, fund size, standard deviation, alpha, expense ratio, and fund age. All control variables except for fund age are lagged by one month, to capture an investor's response to these fund characteristics, expressed through the next month's relative net flow.

The Morningstar Sustainability Rating and Star Rating are treated as categorical variables since these variables are integers, between one and five, and we do not expect the effects of them to be linear (Ammann et al., 2018). We generate dummy variables for each of the rating classes to test for differences between them.

We also include monthly fixed effects in the regression to account for time-varying differences in the fund's net flow and investing activity. To account for the possible problems in our dataset regarding heteroskedasticity and autocorrelation we cluster the error terms on month and fund level. The base regression is as follows:

$$NetFlow_{i,t} = \beta_{i,0} + \beta_{i,1}MSR1_{i,t-1} + \beta_{i,2}MSR2_{i,t-1} + \beta_{i,3}MSR4_{i,t-1} + \beta_{i,4}MSR5_{i,t-1}$$
$$+\beta_{i,5}Star1_{i,t-1} + \beta_{i,6}Star2_{i,t-1} + \beta_{i,7}Star4_{i,t-1} + \beta_{i,8}Star5_{i,t-1} + \beta_{i,9}Return_{i,t-1} + \beta_{i,14}Age_{i,t}$$
$$+\beta_{i,11}Std.Dev_{i,t-1} + \beta_{i,12}Alpha_{i,t-1} + \beta_{i,13}ExpenseRatio_{i,t-1} + \beta_{i,10}LogFundSize_{i,t-1} + e_{i,t} \quad (2)$$

$NetFlow_{i,t}$ is the monthly relative net flow, $\beta_{i,1}MSR1_{i,t-1}$ to $\beta_{i,5}MSR5_{i,t-1}$ are the lagged dummies for the Morningstar Sustainability Rating of one, two, four and five, $\beta_{i,6}Star1_{i,t-1}$ to $\beta_{i,12}Star5_{i,t-1}$ are the lagged dummies for the Star Rating one, two, four, and five, $\beta_{i,11}Return_{i,t-1}$ is the lagged monthly return, $\beta_{i,13}LogFundSize_{i,t-1}$ is the lagged logarithm of fund size, $\beta_{i,13}Std.Dev_{i,t-1}$ is the lagged standard deviation, $\beta_{i,14}Alpha_{i,t-1}$ is the lagged 12-month rolling annualized alpha, $\beta_{i,15}ExpenseRatio_{i,t-1}$ is the lagged expense ratio, and $\beta_{i,16}Age_{i,t}$ is the fund age from its inception date. All lagged variables are lagged by one month.

Table 6: Transition Probability

This table displays the probability of a fund's Sustainability Rating to transition to a different rating the next month. The sample period is from October 2015 to March 2017.

		Next Month Rating				
		1 Globe	2 Globes	3 Globes	4 Globes	5 Globes
Current Rating	1 Globe	84.5 %	14.9 %	0.5 %	0.1 %	0.0 %
	2 Globes	6.8 %	79.9 %	13.1 %	0.3 %	0.0 %
	3 Globes	0.2 %	7.9 %	83.4 %	8.5 %	0.1 %
	4 Globes	0.1 %	0.5 %	15.0 %	78.0 %	6.5 %
	5 Globes	0.0 %	0.0 %	0.9 %	14.4 %	84.7 %

We expect investors to respond to the Morningstar Sustainability Rating and invest based on the provided information. However, this effect should not occur prior to the launch of the sustainability rating, or this effect might be a result of high or low popularity of sustainable funds and not the rating. We, therefore, split the dataset into two sub-samples: six months before and twelve months after the launch of the sustainability rating. The unpublished Morningstar Sus-

tainability Rating for funds is available in Morningstar Direct stretching back to October 2015, which we extrapolate back to September to get six months in the pre-period. The extrapolation is under the assumption that the funds would have received the same sustainability rating in September as they had in October. In Table 6, we find that the probability of a fund receiving the same sustainability rating the next month in the dataset is approximately 82%. Moreover, we split the dataset by investor type into two sub-samples, retail investors and institutional investors.

Table 7: Net Fund Flows in Response to the Sustainability Rating

This table displays the results of the OLS panel regression of monthly fund flows in response to the Sustainability Rating. Other control variables are lagged Star Rating, lagged monthly return, lagged logarithm of fund size, lagged standard deviation of returns, lagged annualized alpha, lagged expense ratio, and fund age. All lagged variables are lagged by one month. Column (1) displays results for all investors from September 2015 to March 2016, prior to the launch of the Sustainability Rating. Column (2) displays the results for all investors March 2016 to March 2017, after the launch. Columns (3) and (4) displays results for the same after-launch period for retail investors. Column (5) displays results for institutional investors after launch. Standard errors are clustered on month and fund level. T-statistics are in parentheses and *, **, *** represents significance at the 10%, 5% and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)
	All	All	Retail	Retail	Institutional
	Before	After	After	After	After
1-month lagged Sustainability Rating					
Low	0.011	0.018***	0.020***		0.013
	(1.40)	(2.58)	(2.60)		(0.54)
Below average	0.002	0.002	-0.005		0.128**
	(0.56)	(0.46)	(-1.55)		(2.07)
Above average	0.008	-0.007**	-0.008**		0.045
	(1.25)	(-2.09)	(-2.16)		(1.46)
High	0.007	-0.010***	-0.012***		0.017
	(0.66)	(-3.03)	(-3.30)		(0.68)
1-month lagged Sustainability Rating				-0.005***	
				(-3.08)	
1-month lagged Star Rating					
Low	-0.011**	-0.012***	-0.014***	-0.020***	-0.056
	(-2.33)	(-3.29)	(-4.01)	(-2.86)	(-1.20)
Below average	-0.002	-0.004	-0.001	-0.006	-0.024
	(-0.34)	(-1.34)	(-0.38)	(-1.55)	(-1.00)
Above average	0.005	0.001	0.003	0.006	0.015
	(1.07)	(0.33)	(0.97)	(1.28)	(0.78)
High	0.001	0.011**	0.023***	0.032***	-0.031
	(0.14)	(2.07)	(3.84)	(4.91)	(-1.18)
1-month lagged monthly return	0.075	0.238***	0.199***	0.314***	0.115
	(1.21)	(3.84)	(3.26)	(3.92)	(0.41)
1-month lagged log fund size	-0.002*	-0.002***	-0.003***	-0.004***	0.010
	(-1.79)	(-3.05)	(-4.25)	(-3.60)	(1.60)
1-month lagged standard deviation	-0.029	0.020	0.063*	0.112*	-0.173
	(-0.67)	(0.54)	(1.70)	(1.70)	(-0.79)
1-month lagged alpha	0.119***	0.158***	0.154***	0.156***	-0.037
	(3.67)	(6.14)	(6.31)	(4.73)	(-0.15)
1-month lagged expense ratio	-0.081	-0.427***	-0.401**	0.286	-0.404**
	(-0.30)	(-3.23)	(-2.25)	(1.33)	(-2.10)
Fund age	-0.001***	-0.001***	-0.001***	-0.001***	0.001
	(-3.21)	(-5.82)	(-5.19)	(-4.76)	(0.23)
Monthly fixed effects	Yes	Yes	Yes	Yes	Yes
Constant	0.053**	0.058***	0.070***	0.087***	-0.160
	(2.23)	(4.15)	(4.61)	(3.81)	(-1.64)
R2	0.020	0.040	0.056	0.098	0.091
Observations	2594	5387	4405	2046	347

Table 7 displays our main findings. We find that funds with a low sustainability rating receive a higher net flow per month than an average-rated fund and that funds with a high sustainability rating suffer from a lower net flow per month than an average-rated fund. Column (1) displays the results for all investors in the pre-publication period. As expected, we do not find any significant relationship between the sustainability rating and relative net flows, prior to the launch of the rating.

Column (2), (3), (4), and (5) displays net flow in response to the Sustainability Rating after the publication of the rating. For all investors combined, retail and institutional, we find a significant effect on both a low and a high sustainability rating, which suggests that most investors in the sample are retail investors. Column (2) displays results for all investors. We find that funds with a low sustainability rating on average receive a net flow per month 1.8 percentage points higher than an average-rated fund, while a fund with a high sustainability rating suffers on average from a net flow per month 1.0 percentage points lower than an average-rated fund. These findings are significant at the one-percent level. Furthermore, funds with an above average sustainability rating suffer from a net flow per month 0.7 percentage points lower than an average-rated fund, significant at the five-percent level.

The effect of the sustainability rating becomes more evident when we look at retail investors after the launch, in Column (3). A fund with a low sustainability rating receives a net flow per month 2.0 percentage points higher than an average-rated fund. A fund with a high sustainability rating suffers from a net flow per month 1.2 percentage points lower than an average-rated fund. In Column (4) the sustainability rating is included as a single variable, covering all five ratings. The results indicate that higher ratings lead to lower net flow.

Regarding the Star Rating, in Column (3), funds with a low star rating suffers from a net flow per month 1.4 percentage points lower than an average-rated fund. A fund with a high star rating receives a net flow per month 2.3 percentage points higher than an average-rated fund. The effect of the Star Rating is consistent with previous papers such as Del Guercio et al. (2007) and Khorana & Servaes (2012)

As seen in the summary statistics, the funds with a low sustainability rating have higher monthly net flows, and their average star ratings are higher than the high-rated funds. This indicates that they over time have performed better and this might explain the positive net flow. The

high net flow can also come from Scandinavian investors having little faith in sustainable funds, which we will discuss in greater length later in the thesis.

Institutional investors do not respond to the sustainability rating to the same extent as retail investors, as expected and showed by Ammann et al. (2018). The effect of the rating has no clear trend in the institutional investors net flows. Only the below average rating shows some significance while all other ratings remain insignificant, as seen in Column (5). This is most likely due to the fact that these funds are open to retail investors as well. Because of these findings, the main focus throughout the rest of our regressions will be on retail investors in the 12 months following the launch of the Morningstar Sustainability Rating since this is where the most interesting findings are.

6.2.2 Net Fund Flows in Response to the Sustainability Rating by Fund Type

In Table 8, we examine fund flows in response to the Sustainability Rating, by sub-samples on three major Morningstar Fund Categories, defined by Morningstar's "Global Broad Category Group". However, due to missing observations and few funds of the more special categories registered in Scandinavia, we only examine the three largest groups. These are Equity, Fixed Income, and Alternative funds, and we filter the data on these fund types before running the regressions. The regression also includes the Star Rating and the same control variables used in the base regression, but we have chosen to not display them in each regression in order to highlight the variable of interest.

Column (1) displays equity funds and Column (2) displays alternative funds. Fixed income funds are displayed in Table 14 in the appendix. In Column (1), we find that an average equity fund with a low sustainability rating receives a net flow per month 2.5 percentage points higher than an average-rated equity fund. A fund with high sustainability rating suffers from a net flow per month 1.1 percentage points lower than an average-rated equity fund. The results for the fixed income funds are shown in Table 14 in the appendix since we see that the sustainability rating is omitted. The omitted variable is caused by too few and missing variables. Also, when using fixed effects in our model we look at the impact of a change in the rating, so these results could also indicate that the rating for the fixed income funds does not change much during our period.

Table 8: Net Fund Flows in Response to the Sustainability Rating by Fund Type

This table displays mutual fund flows in response to the Sustainability Rating in sub-samples by fund categories. Column (1) is equity funds and Column (2) is alternative funds. Other control variables are lagged Star Rating, lagged monthly return, lagged logarithm of fund size, lagged standard deviation of returns, lagged annualized alpha, lagged expense ratio, and fund age. All lagged variables are lagged by one month. Standard errors are clustered on month and fund level. T-statistics are in parentheses and *, **, *** represents significance at the 10%, 5% and 1% levels, respectively. The full table is in the appendix Table 13.

	(1) Equity	(3) Alternative
1-month lagged Sustainability Rating		
Low	0.025***	0.008
	(2.93)	(0.87)
Below average	-0.004	0.017
	(-1.04)	(1.52)
Above average	-0.003	0.043***
	(-0.84)	(2.87)
High	-0.011***	0.000
	(-2.92)	(.)
Monthly fixed effects	Yes	Yes
Constant	0.037*	0.154**
	(1.80)	(2.00)
Observations	2512	397
R2	0.097	0.237

Column (2) displays fund flows in response to the sustainability rating for alternative fund types. A low sustainability rating has no significant effect on net flows. Furthermore, the model omits the coefficient on high sustainability rating due to no observations of alternative funds with a high sustainability rating in the period. However, a fund with an above average sustainability rating yields a 4.3 percentage points higher net flow per month than an average-rated fund. Indicating that high sustainability has a positive effect on alternative funds.

6.2.3 Combinations of Morningstar's Sustainability Rating and Star Rating

To see if there are some combinations of sustainability and performance that affect the net flow, we include interaction terms with combinations of the Sustainability Rating and the Star Rating to the base regression. We include interaction terms on the highest and lowest ratings since these have shown significant effects on the net flow.

The interaction terms show the interaction between the high/low star rating and high/low sustainability rating. High is a rating of 5, low is a rating of 1. We define upper as ratings of 4 or 5, and lower as ratings of 1 or 2. The regression also includes the star rating and the same control variables used in the base regression, but we have chosen to not display them in each regression in order to highlight the variable of interest.

Table 9: Combinations of Morningstar's Sustainability Rating and Star Rating

This table displays mutual fund flows in response to the Sustainability Rating, with combinations of the Sustainability and Star Rating. Both columns include the additional control variables lagged Star Rating, lagged monthly return, lagged logarithm of fund size, lagged standard deviation, lagged annualized alpha, lagged expense ratio and fund age. All lagged variables are lagged by one month. Upper rating means a fund with a rating of either 4 or 5, while lower means a rating of either 1 or 2. Standard errors are clustered on month and fund level. T-statistics are in parentheses and *, **, *** represents significance at the 10%, 5% and 1% levels, respectively. The full table is in the appendix Table 14.

	(1) Retail After	(2) Retail After
1-month lagged Sustainability Rating		
Low	0.023**	0.027**
	(2.47)	(2.52)
Below average	-0.005	-0.002
	(-1.56)	(-0.42)
Above average	-0.008**	-0.011***
	(-2.17)	(-2.83)
High	-0.013***	-0.017***
	(-3.53)	(-3.53)
Interaction terms		
High Star*High Sustainability	0.000	
	(0.04)	
High Star*Low Sustainability	-0.010	
	(-0.58)	
Low Star*High Sustainability	0.059***	
	(9.80)	
Low Star*Low Sustainability	-0.025**	
	(-2.38)	
Interaction terms (combined)		
Upper Star*Upper Sustainability		0.007
		(0.93)
Upper Star*Lower Sustainability		-0.014
		(-0.85)
Lower Star*Upper Sustainability		0.013**
		(2.37)
Lower Star*Lower Sustainability		-0.012*
		(-1.94)
Monthly fixed effects	Yes	Yes
Constant	0.076***	0.073***
	(4.56)	(4.39)
Observations	4405	4405
R2	0.057	0.058

Column (1) displays the sustainability rating and combinations of high and low sustainability rating and star rating. The sustainability rating by itself still has the same impact as in the base regression, low rating yields higher net flow and high rating lower net flow than an average-rated fund. The combination of low star rating and high sustainability rating receive a net flow per month 5.9 percentage points higher than an average-rated fund. That is, if a fund historically has shown low long-term risk-adjusted returns, the fund receives higher net flow if it also has a high sustainability rating. This suggests that some investors value sustainability. Moreover, a fund with low star rating and low sustainability rating suffers a net flow per month 2.5 percentage points lower than average-rated funds.

Column (2) displays combinations of upper and lower star rating and sustainability rating. Funds with the combination upper star rating and lower sustainability rating receive a net flow per month 1.3 percentage points higher than an average-rated fund. Funds with the lower star rating and lower sustainability rating combination suffer from a net flow per month 1.2 percentage points lower than an average-rated fund. This is the same effect as shown in Column (1), but the effect of the combinations is now weaker as we allow for the above- and below ratings as well.

6.2.4 Net Fund Flows in Response to the Sustainability Rating by Countries

In Table 10, we examine fund flows in response to the Sustainability Rating by the Scandinavian countries, Norway, Sweden and Denmark. The control variables remain the same as in the base regression, but we have chosen to not display them in each regression in order to highlight the Sustainability Rating. We filter the data by countries before running the regressions.

Table 10: Net Fund Flows in Response to the Sustainability Rating by Countries

This table displays mutual fund flows in response to the Sustainability Rating in sub-samples by countries. Column (1) is Norwegian funds, (2) Swedish funds, and (3) Danish funds. Other control variables are lagged Star Rating, lagged monthly return, lagged logarithm of fund size, lagged standard deviation of returns, lagged annualized alpha, lagged expense ratios, and fund age. All lagged variables are lagged by one month. Standard errors are clustered on month and fund level. T-statistics are in parentheses and *, **, *** is significance at the 10%, 5% and 1% levels, respectively. The full table is in the appendix Table 15.

	(1) Norway	(2) Sweden	(3) Denmark
1-month lagged Sustainability Rating			
Low	0.015	-0.003	0.025
	(1.54)	(-0.24)	(1.48)
Below average	-0.006*	-0.001	-0.011
	(-1.81)	(-0.16)	(-0.87)
Above average	-0.008**	0.008	-0.073***
	(-2.06)	(0.75)	(-4.71)
High	-0.017***	-0.001	0.000
	(-3.95)	(-0.18)	(.)
Monthly fixed effect	Yes	Yes	Yes
Constant	0.094***	0.085*	-0.278***
	(4.94)	(1.95)	(-4.46)
Observations	3370	806	229
R2	0.064	0.090	0.419

Column (1) displays funds based in NOK. A Norwegian fund with a high sustainability rating suffers a net flow per month 1.7 percentage points lower than an average-rated Norwegian fund. We also see that an above average-rated fund receives a net flow 0.8 percentage points lower than an average-rated fund. The low sustainability rating has a insignificant positive effect on the Norwegian funds' net flows. We find no evidence that Swedish investors value information on sustainability. Column (3) displays funds based in DKK. The low sustainability rating has a positive insignificant effect while the high sustainability rating is omitted due to no observations in the period. Danish funds with an above average sustainability rating suffer from a net flow per month 7.3 percentage points lower than an average-rated fund. Thus, we see that this might be a trend for some of the Scandinavian investors.

These results suggest that there are country differences when it comes to how the investors reacted to the launch of the Morningstar Sustainability Rating.

6.2.5 Net Fund Flows in Response to the Sustainability Rating by Fund Size

In Table 11, we examine the effect of sustainability rating, for different fund size quintiles. Q1 represents the 20% smallest funds and q5 the 20% largest funds. The quintiles are split across different regressions to see if investors respond differently to the Morningstar Sustainability Rating based on the fund's size.

Table 11: Net Fund Flows in Response to the Sustainability Rating by Fund Size

This table displays mutual fund flows in response to the Sustainability Rating, in sub-samples by fund size quintiles. All columns include the additional control variables lagged Star Rating, lagged monthly return, lagged standard deviation, lagged annualized alpha, lagged expense ratio, and fund age. All lagged variables are lagged by one month. Standard errors are clustered on month and fund level. T-statistics are in parentheses and *, **, *** represents significance at the 10%, 5% and 1% levels, respectively. The full table is in the appendix Table 16.

	(1)	(2)	(3)	(4)	(5)	(6)
	q1	q2	q3	q4	q5	Retail After
1-month lagged Sustainability Rating						
Low	0.001	0.026	0.009	0.073***	0.019**	0.020***
	(0.05)	(1.31)	(0.68)	(2.87)	(2.53)	(2.60)
Below average	-0.015*	0.002	-0.000	-0.021*	0.004	-0.005
	(-1.85)	(0.21)	(-0.06)	(-1.84)	(0.99)	(-1.55)
Above average	0.009	-0.026*	-0.008	-0.013**	0.003	-0.008**
	(0.44)	(-1.91)	(-0.94)	(-2.18)	(0.67)	(-2.16)
High	-0.030**	0.003	-0.032**	-0.016***	0.006	-0.012***
	(-2.14)	(0.29)	(-2.40)	(-3.03)	(1.27)	(-3.30)
1-month lagged log fund size						-0.003***
						(-4.25)
Monthly fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.033	0.016	0.009	0.010	0.017***	0.075***
	(1.29)	(1.06)	(0.68)	(0.55)	(2.86)	(4.53)
Observations	830	698	845	1078	954	4405
R2	0.132	0.152	0.068	0.050	0.047	0.056

We see varying results for the different fund size quintiles (our base regression is displayed in Column (6) for comparison). In Column (1) we see that for the smallest quintile, q1 (assets below $11 million), an average high-rated fund suffers from a net flow per month 3.0 percentage points lower than an average-rated fund, while there is no significance for the low-rated funds in this size quintile. However, by the highest quintile in Column (5), funds with assets above $278 million, the low-rated funds receive a net flow per month 1.9 percentage points higher than average-rated funds. There are no significant results for the high-rated funds in this fund size

quintile. We find similar and stronger results for the q4 quintile in Column (4). For these funds, a low sustainability rating recieve a net flow per month 7.3 percentage points higher than an average-rated fund, while a fund with a high sustainability rating suffers from a net flow per month 1.6 percentage points lower than an average-rated fund. This indicates that the funds in the q4 quintile are most sensitive to the Morningstar Sustainability rating and that they have the most similar reaction compared to our overall findings. The fund size in this quintile ranges from $107 million to $278 million.

The results show a clear trend: having a high sustainability rating is negative for the fund flows if the fund is among the smaller ones, and it has little to no effect if the fund is large. For the low rating, the trend is the opposite. We see that large funds benefit from having a low sustainability rating, giving them a significantly higher net flow than average-rated funds. The low rating has no effect for the smaller funds.

6.3 Event Study

As the launch represents an exogenous shock to investors' decision-making, we conduct an event study to measure investors' immediate flow response to the launch of the rating. We employ an event study approach described by Del Guercio et al. (2007), who investigates the impact of Morningstar's Star Rating on mutual fund flows. Event studies that examine stock return usually assume immediate stock price response to new information, implied by market efficiency. The impact of a new rating, however, may last for many months. Del Guercio et al. (2007) argues that delayed response to a fund rating may occur if investors make investment decisions in determined intervals, or that causal investors respond with lags to the new rating. Thus, we use an event window of 6 months after the launch of the rating ($t = [1; 6]$). We define the publication of the rating on March 2016 as the event date ($t = 0$) and choose an estimation window of 24 months prior to the event date, to predict the normalized fund flow ($t = [-24; -1]$). To create a time-series benchmark of normalized fund flow to fund i, we use the following model:

$$\begin{aligned} NetFlow_{i,t} = \beta_{i,0} + \beta_{i,1} NetFlowCategory_{i,1} + \beta_{i,2} NetFlow_{i,t-1} + \beta_{i,3} Return_{i,t-1} \\ + \beta_{i,4} \Delta Alpha_{i,t-1} + \beta_{i,5} (\Delta Alpha_{i,t-1})^2 + e_{i,t} \end{aligned} \tag{3}$$

Where $NetFlow_{i,t}$ is the net flow to fund i at time t, $\beta_{i,1} NetFlowCategory_{i,1}$ is the average relative net flow at time t to all funds in the same category as fund i, and $NetFlow_{i,t-1}$ is the lagged net flow to fund i. $Return_{i,t-1}$ is the lagged monthly net return of fund i. We include the change in fund i's alpha from time $t-2$ to $t-1$, $\Delta Alpha_{i,t-1}$, not the absolute term, because of high correlation among the explanatory variables, as suggested by Del Guercio et al. (2007). We include the squared change in alpha to account for the non-linear relationship between performance and fund flows. $\beta_{i,0}$ represents the average fund specific abnormal flow and is expected to cover relatively constant variables such as net expenses, fund age, and star rating. These variables are not included in the fund-wise regression as we will difference these away once we subtract the predicted normalized flow from the observed flow.

We calculate the abnormal fund flow by subtracting the predicted normalized net flow from the observed fund flow, for each month in the event window. The sum of the abnormal flow is the cumulative flow to each fund. We test the average cumulative abnormal flow for all funds, by sustainability rating, to see if it is statistically different from zero.

Table 12: Event Study

This table displays the average cumulative standardized abnormal fund flows $\overline{CSAF_t}$ by Sustainability Rating and the event window of the first six months following the launch of the rating ($t = [0; 6]$). To estimate a benchmark for normalized fund flow for each individual fund, we regress the net flow on variables known to be important predictors of fund flow, as described by Del Guercio et al. (2007). We regress net flow on the average relative net flow to all funds at time t, and one-month lagged net flow to each fund, one-month lagged monthly return, the change in alpha from $t-2$ to $t-1$, and the squared change in alpha. We base the estimation on a window of 24 months prior to the launch of the rating on March 2016 ($t = [-24; 0]$). *, **, *** represents significance at the 10%, 5% and 1% levels, respectively

	Low		Below Average		Average		Above Average		High	
Event month	$\overline{CSAF_t}$	$p-value$	$\overline{CSAF_t}$	$p-value$	$\overline{CSAF_t}$	$p-value$	$\overline{CSAF_t}$	$p-value$	$\overline{CSAF_t}$	$p-value$
1	0.142*	0.09	0.037	0.24	-0.007	0.57	-0.007	0.77	-0.022	0.18
2	0.174**	0.04	0.022	0.47	-0.008	0.48	-0.015	0.52	-0.013	0.48
3	0.135*	0.07	-0.003	0.86	0.023	0.37	-0.021	0.29	-0.014	0.45
4	0.156**	0.03	-0.034*	0.06	0.030	0.20	-0.009	0.65	-0.018	0.37
5	0.126*	0.08	-0.018	0.22	0.019	0.38	-0.022	0.13	0.014	0.68
6	0.117	0.26	-0.008	0.40	-0.005	0.71	0.017	0.62	0.012	0.74

6.3.1 Event Study Results

Table 10 displays the average cumulative standardized fund flows $\overline{CSAF_t}$ by sustainability rating and the event window of the first six months after the launch of the Sustainability Rating. For funds with low sustainability rating, $\overline{CSAF_t}$ is significantly positive for the first five months in the event window. While we in the panel regression find a significant negative net flow to high-rated funds, we cannot confirm this in the event study. The study shows that high-rated funds have negative flows in the months following the launch, but these results are not significant. These results are in line with flow literature (e.g., see Salganik-Shoshan (2015) and Khorana & Servaes (2012)) that inflow is more sensitive to historical information than outflow. Some investors respond immediately to the publication of the Sustainability Rating, while others respond with lags.

In Table 18 in the appendix, we examine the average standardized fund flows $\overline{SAF_t}$ by sustainability rating and the same event window of the first six months, which confirms a positive (although weaker) net flow to low-rated funds.

7 Why Do Investors Shift Away from Sustainability?

7.1 Introduction

In our analysis we find that investors actively shift money away from funds with high sustainability rating to funds with low sustainability rating. In the following, we explore two possible explanations for the observed behavior. The first possible explanation is that investors view sustainability as a negative predictor of future returns and value wealth over sustainability. The second possible explanation is that investors do not agree with Morningstar's view on sustainability. These explanations are not mutually excluding and may partially explain why investors shift away from sustainability, but we cannot provide a definite conclusion to the underlying force of demand.

7.2 Sustainability vs Wealth

Investors may view screening on sustainability as a limiting factor for the ability to achieve superior returns. By definition, any restrictions inhibit choice, and investors may see non-financial screening criteria as a limitation of the fund manager's ability to perform. Hence, excluding non-sustainable investments may lower returns and result in a less diversified portfolio. This leaves investors with a trade-off between high sustainability and high performance. Socially aware investors who exit or exclude low sustainability holdings do so to lower the profitability and the market value of non-sustainable underlying companies, and pressure management to undergo changes to become more sustainable (Dimson et al., 2015). However, if the divestment is substantial enough to affect market value, the difference between market value and intrinsic value is not likely to be permanent. A decrease in the short-term market value of a company will not typically affect cash flows from its operations. Even if a low sustainability rating leads to a depressed share price in the short term, investors who are neutral to sustainability will research and invest if the long-term value is not altered. Therefore, the depressed share price will revert back to its intrinsic value in the medium- to long-term (Ansar et al., 2013). On the other hand, finance theory suggests that a reduction in the relative size of a firm's investor base will increase the firm's cost of capital (Merton, 1987). If enough investors exclude a company the exclusion may restrict the company's access to debt financing and lead investors to apply a higher discount rate to future cash flows. Thus, the weighted average cost of capital (WACC)

of the target company will increase. That is, the future return to the remaining investors will be higher, given the same systematic risk (Dimson et al., 2015). Investors who believe the effect of exiting or excluding non-sustainable funds is negligible, or that a reduction in the investor base only will provide the remaining investors with a higher future return, might not invest according to their social beliefs. Superior return might compensate for the emotional "cost" of exposure to low-sustainable investments (Dimson et al., 2015).

Girard et al. (2007) argue that socially responsible funds are not able to maintain the same returns as conventional funds since socially responsible constraints entail costs in the form of lower reward-to-risk. Thus, investors bear a cost of aligning their investments with their social preferences, which can be viewed as altruism. However, Girard et al. (2007) also find that socially responsible fund managers show poor selectivity, net selectivity, and market timing ability, compared to active benchmark indices. This entails a cost associated with poor portfolio management skills, which cannot be justified by any stand on sustainability. Therefore, socially responsible investors bear a cost of both low risk-to-reward and poor portfolio management skills. Table 3 indicates that funds in our sample with low sustainability rating on average outperform funds with high sustainability rating on all performance measures, monthly return, one-year alpha, and star rating, over the first year following the publication of the rating. Thus, there is a trade-off between high returns and high sustainability.

If low risk-to-reward and poor portfolio management are common perceptions of sustainable funds among investors, it can explain why investors shift away from funds with a high sustainability rating to funds with a low sustainability rating. Levitt & List (2007) present a utility model of wealth and morality and argue that *"as the stakes of the game rise, wealth concerns will increase in importance relative to fairness concerns"*. Thus, high financial stakes suggest high wealth concerns. This is supported by Døskeland & Pedersen (2016), who conduct a natural field experiment and frame responsible investments with regard to either wealth or morality. They find that wealth concerns are more important to Norwegian investors than moral concerns. The pattern we find in fund flows can be due to the trade-off between sustainability and wealth and that the majority of Scandinavian investors value wealth over sustainability.

However, in Table 9, we find that funds with the combination of low star rating and high sustainability rating on average receive a net flow per month 6.0 percentage points higher than an average-rated fund. That is, given a fund with low long-term historical risk-adjusted performance, a high sustainability rating increases the net flow. Hence, sustainability is important

when the performance of the fund is low. Døskeland & Pedersen (2016) also argue that the moral aspect remains important, even though wealth is the main concern. Similarly, Riedl & Smeets (2017) suggest that socially aware investors are willing to forgo financial returns in order to align investments with their social preferences. Our findings suggest that even though the majority of investors place a negative value on sustainability, there are still some investors who value sustainability. Furthermore, Figure 4 in appendix displays a greater spread of net flow to funds with low sustainability rating than the other ratings, which supports that investors have a conflicting view on low sustainability.

7.3 Is the Morningstar Sustainability Rating a Good Indicator of Sustainability?

The Sustainability Rating is not an objective truth, rather a series of judgments made by the provider, Sustainalytics, on ESG issues. How Sustainalytics interpret the term sustainability and how the ESG scores are calculated and weighted makes a major difference in the final sustainability rating of a mutual fund that is visible to investors. If investors have a conflicting view on sustainability, this might explain why they gradually shift away from funds with high sustainability ratings.

Seesel (2018) argues that the criteria needed for a reliable rating are impossible to find and standardize. There are several providers of ESG scores, who evaluate sustainability in different ways. FTSE Russell, MSCI, and Sustainalytics are three major providers of ESG indices, and they all have different criteria and combine the separate scores on environment, social, and governance differently. In some cases, this may lead to vastly different ratings for the same company. For instance, MCSI gives Tesla a top score on environmental issues, while FTSE Russell gives Tesla a zero on environmental issues. The deviation occurs as MSCI scores environmental issues based on the carbon emissions from its products, while FTSE Russel ignores emission from the cars and only focuses on the emission from the factory (The Wall Street Journal, 2018). Thus, there are many ways to interpret sustainability and investors might exit funds despite a high sustainability rating, or buy funds despite a low sustainability rating because they have a different perception of what it means to be sustainable.

Furthermore, the Morningstar Sustainability Rating is calculated relatively within each mutual fund category, not in absolute terms across all funds. The Sustainability Rating is, therefore,

a result of a relative comparison within each category. For instance, in our sample, the mutual fund ODIN Energi C, which has no sustainability mandate and top holdings in petroleum companies, had an above average sustainability rating (four globes). DNB Miljøinvest, on the other hand, with an environmentally focused sustainability mandate and top holdings in clean energy, had a low sustainability rating (1 globe). Thus, by the sustainability rating, the petroleum fund appears to be a far more sustainable investment than the clean energy fund. The two funds have different Global Categories, and they are therefore relatively compared to different funds. Moreover, DNB Miljøinvest states that it engages in active ownership to improve their holdings on ESG issues (DNB, 2017). As the Morningstar Sustainability Rating only considers the current situation, not efforts for future improvements, it will not reflect a socially aware active owner. This might leave investors to buy funds with a low sustainability rating, even if they value sustainability.

In Table 18 and Table 19 in the appendix, we examine the funds in our sample by investment area. Of the funds with a low sustainability rating, 41.3% have Scandinavia or Northern Europe as their main investment area. For comparison, 21.5% of the funds with a high sustainability rating have their main investment area in Northern Europe. A perception among Scandinavian investors might be that funds mostly investing in Scandinavian equity will not compromise their social beliefs due to cultural aspects and legislation in Scandinavia, thus explaining why investors put a positive value on the low-rated funds in our sample.

Moreover, a fund can receive different ratings each month even without changing its holdings. As the rating is in relative terms, a fund is exposed to changes in other funds' holdings within the same category. Thus, a fund's rating might change solely because other funds change their holdings or that the underlying companies are involved in a scandal. As the relative relationship between funds in the category changes, the rating changes. Investors might shift away from sustainability because they do not agree with how Morningstar rate sustainability.

8 Conclusion

We examine the effect of the introduction of the Morningstar Sustainability Rating in March 2016 on fund flows for Scandinavian funds. The introduction of the rating is the first time information on sustainability became freely accessible to all investors, thus providing investors with a new decision-making criterion. By employing panel regressions and an event study, we find strong evidence that retail investors shift away from funds with high sustainability rating to funds with low sustainability rating. A low-rated fund receives on average a net flow per month 2.0 percentage points higher than an average-rated fund, and a high-rated fund suffers on average a net flow per month 1.2 percentage points lower than an average-rated fund during the first year after the launch of the rating. In the event study, we find that inflow is more sensitive to the launch of the rating than outflow, as investors respond immediately by investing in the low-rated funds, while investors exit high-rated funds with lags.

Furthermore, we examine net flows in response to the Sustainability Rating by different fund types and countries. In line with the base regression, we find that investors in Norwegian, Danish, and equity funds shift away from high-rated to low-rated funds. We find no evidence that the Swedish investors value the Sustainability Rating. The fund type analysis indicates that the sustainability rating matter most for equity funds while having some positive effect on the alternative funds. Moreover, we find that having a high sustainability rating can lead to positive net flows if the fund has a low star rating, which suggests that investors care about sustainability when performance is poor.

We provide two possible explanations to why investors shift away from sustainability. Firstly, investors might view sustainability as a negative predictor of future returns, and value wealth over sustainability. Existing literature at the portfolio level indicates that socially responsible investors bear a cost of both lower risk-to-reward and poor portfolio management skills. Secondly, investors might have a different perception of what it means to be sustainable than Morningstar, and invest according to other criteria. As the high-rated funds do not necessarily reflect investors perception of sustainability, investors might get the worst of both worlds by investing in the funds with high sustainability rating - both low performance and lower than expected sustainability.

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9 Appendix

Figure 4: Example of Morningstar's Sustainability Rating

Example of the Morningstar Sustainability Rating which is displayed alongside other sustainability information.

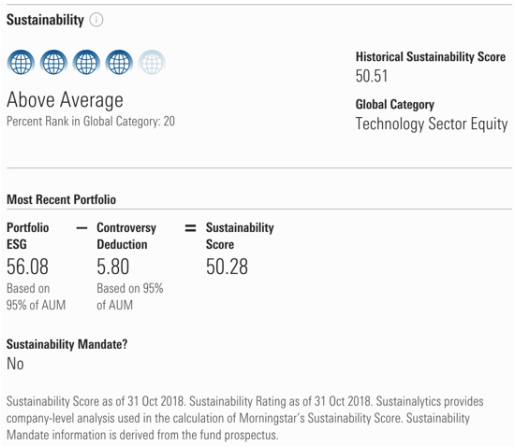

Figure 5: Cumulative Fund Flows by Sustainability Rating

This figure displays net flow by the Sustainability Rating. The whiskers represent the upper and lower adjacent value, the box represent the interquartile range, and the line crossing the box is the median observation.

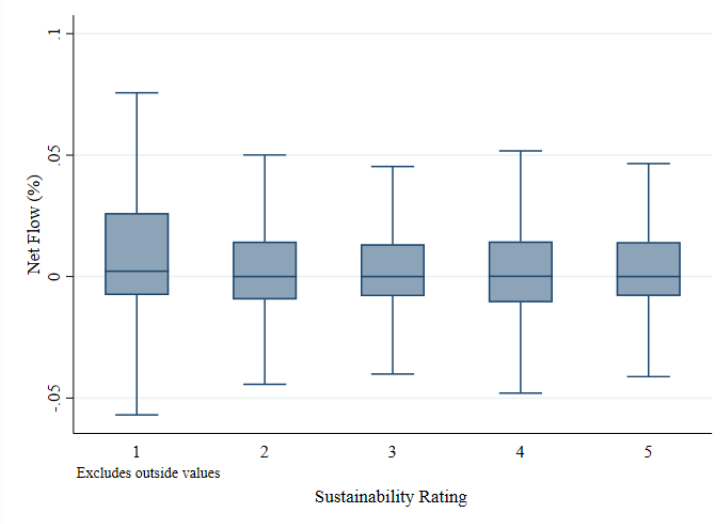

Figure 6: Average Net Fund Flows by Star Rating

This figure displays cumulative moving average of net fund flows by Star Rating for September 2015 to March 2017. Low, average, and high Star Rating represents a Star Rating of 1, 3, and 5, respectively.

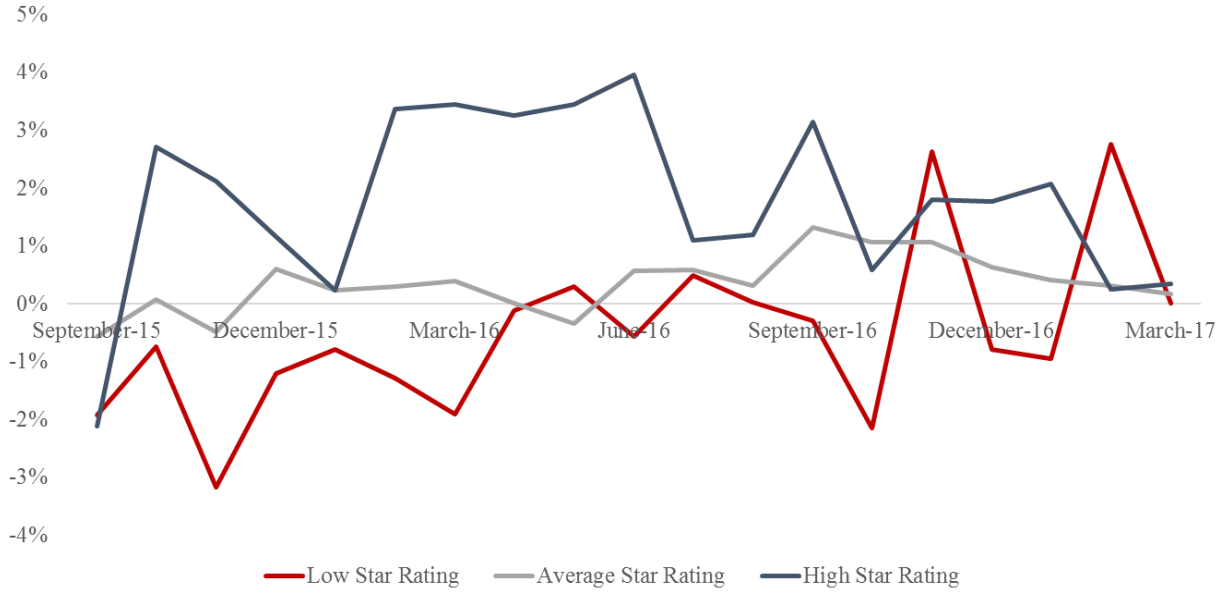

Figure 7: Cumulative Net Fund Flows by Star Rating

This figure displays cumulative moving average of net fund flows by Star Rating for September 2015 to March 2017. The shaded area represents 95% confidence interval. Low, average, and high Star Rating represents a Star Rating of 1, 3, and 5, respectively.

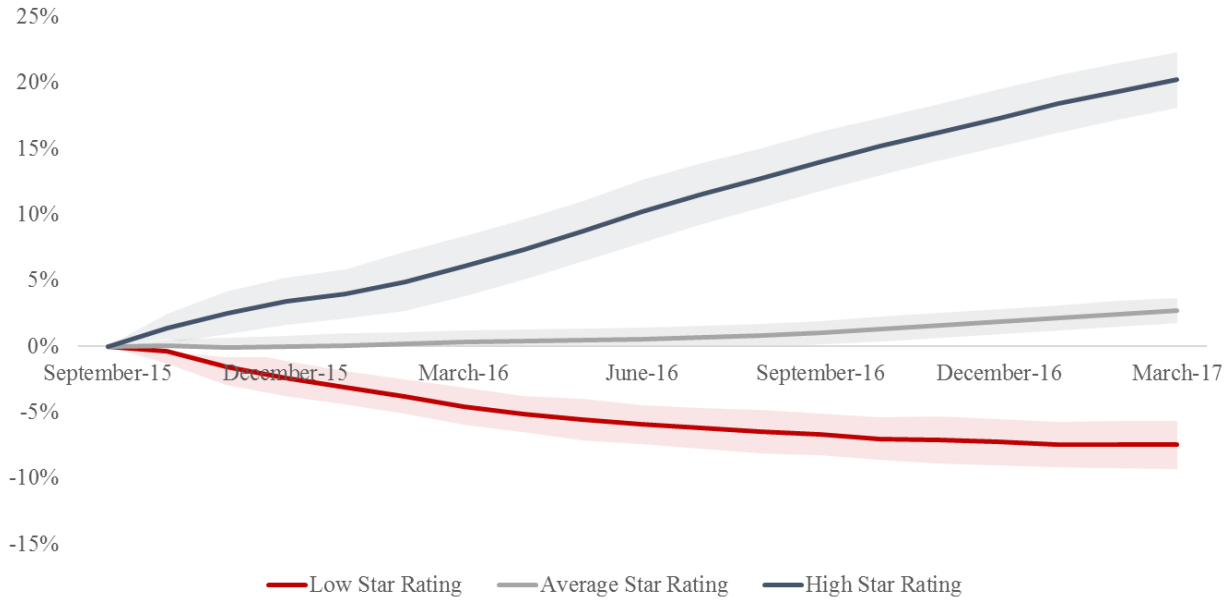

Table 13: Net Fund Flows in Response to the Sustainability Rating by Fund Type

This table displays mutual fund flows in response to the Sustainability Rating in sub-samples by fund categories. Column (1) is equity funds, (2) fixed income and (3) alternative fund type. Standard errors are clustered by month and fund. Other control variables are lagged Star Rating, lagged monthly return, lagged logarithm of fund size, lagged standard deviation of returns, lagged annualized alpha, lagged expense ratio, and fund age. All lagged variables are lagged by one month. Standard errors are clustered on month and fund level. T-statistics are in parentheses and *, **, *** represents significance at the 10%, 5% and 1% levels, respectively.

	(1) Equity	(2) Fixed Income	(3) Alternative
1-month lagged Sustainability Rating			
Low	0.025***	0.000	0.008
	(2.93)	(.)	(0.87)
Below average	-0.004	0.000	0.017
	(-1.04)	(.)	(1.52)
Above average	-0.003	0.000	0.043***
	(-0.84)	(.)	(2.87)
High	-0.011***	0.000	0.000
	(-2.92)	(.)	(.)
1-month lagged Star Rating			
Low	-0.013**	-0.011**	0.004
	(-2.12)	(-2.17)	(0.37)
Below average	-0.001	-0.001	-0.008
	(-0.30)	(-0.16)	(-0.79)
Above average	0.007*	-0.004	0.008
	(1.80)	(-0.71)	(1.38)
High	0.033***	-0.006	0.018
	(4.36)	(-0.52)	(1.35)
1-month lagged monthly return	0.339***	-0.439	0.073
	(4.64)	(-1.48)	(0.31)
1-month lagged log of fund size	-0.003***	-0.005***	-0.007**
	(-2.89)	(-2.76)	(-2.19)
1-month lagged standard deviation	0.106*	0.103	0.091
	(1.78)	(0.55)	(0.53)
1-month lagged alpha	0.118***	0.175*	0.484***
	(4.79)	(1.75)	(4.42)
1-month lagged expense ratio	0.372*	-2.221***	-0.969
	(1.89)	(-3.13)	(-1.39)
Fund age	-0.001***	-0.001**	-0.001*
	(-5.01)	(-2.38)	(-1.71)
Monthly fixed effects	Yes	Yes	Yes
Constant	0.037*	0.115***	0.154**
	(1.80)	(2.70)	(2.00)
Observations	2512	1494	397
R2	0.097	0.034	0.058

Table 14: Combinations of Morningstar's Sustainability Rating and Star Rating

This table displays mutual fund flows in response to the Sustainability Rating, with combinations of the Sustainability and Star Rating. All columns include the additional control variables lagged Star Rating, lagged monthly return, lagged logarithm of fund size, lagged standard deviation, lagged annualized alpha, lagged expense ratio and fund age. All lagged variables are lagged by one month. Upper rating means a fund with a rating of either 4 or 5, while lower means a rating of either 1 or 2. Standard errors are clustered on month and fund level. T-statistics are in parentheses and *, **, *** represents significance at the 10%, 5% and 1% levels, respectively.

	(1) Retail After	(2) Retail After
1-month lagged Sustainability Rating		
Low	0.023**	0.027**
	(2.47)	(2.52)
Below average	-0.005	-0.002
	(-1.56)	(-0.42)
Above average	-0.008**	-0.011***
	(-2.17)	(-2.83)
High	-0.013***	-0.017***
	(-3.53)	(-3.53)
1-month lagged Star Rating		
Low	-0.014***	-0.012***
	(-4.01)	(-3.45)
Below average	-0.001	-0.001
	(-0.36)	(-0.33)
Above average	0.003	0.002
	(0.95)	(0.73)
High	0.023***	0.022***
	(3.71)	(3.44)
1-month lagged monthly return	0.199***	0.201***
	(3.24)	(3.28)
1-month lagged log of fund size	-0.003***	-0.003***
	(-4.30)	(-4.13)
1-month lagged standard deviation	0.065*	0.064*
	(1.76)	(1.72)
1-month lagged alpha	0.154***	0.153***
	(6.33)	(6.25)
1-month lagged expense ratio	-0.417**	-0.397**
	(-2.34)	(-2.25)
Fund age	-0.001***	-0.001***
	(-5.17)	(-5.28)

Interaction terms		
HighStarRating*HighSustainabilityRating	0.000	
	(0.04)	
HighStarRating*LowSustainabilityRating	-0.010	
	(-0.58)	
LowStarRating*HighSustainabilityRating	0.059***	
	(9.80)	
LowStarRating*LowSustainabilityRating	-0.025**	
	(-2.38)	
UpperStarRating*UpperSustainabilityRating		0.007
		(0.93)
UpperStarRating*LowerSustainabilityRating		-0.014
		(-0.85)
LowerStarRating*UpperSustainabilityRating		0.013**
		(2.37)
LowerStarRating*LowerSustainabilityRating		-0.012*
		(-1.94)
Monthly fixed effects	Yes	Yes
Constant	0.076***	0.073***
	(4.56)	(4.39)
Observations	4405	4405
R2	0.057	0.058

Table 15: Net Fund Flows in Response to the Sustainability Rating by Countries

This table displays mutual fund flows in response to the Sustainability Rating in sub-samples by countries. Column (1) is Norwegian funds, (2) Swedish funds and (3) Danish funds. Other control variables are lagged Star Rating, lagged monthly return, logarithm of fund size, lagged standard deviation of returns, lagged annualized alpha, lagged expense ratios, and fund age. All lagged variables are lagged by one month. Standard errors are clustered on month and fund level. T-statistics are in parentheses and *, **, *** is significance at the 10%, 5% and 1% levels, respectively.

	(1) Norway	(2) Sweden	(3) Denmark
1-month lagged Sustainability Rating			
Low	0.015	-0.003	0.025
	(1.54)	(-0.24)	(1.48)
Below average	-0.006*	-0.001	-0.011
	(-1.81)	(-0.16)	(-0.87)
Above average	-0.008**	0.008	-0.073***
	(-2.06)	(0.75)	(-4.71)
High	-0.017***	-0.001	0.000
	(-3.95)	(-0.18)	(.)
1-month lagged Star Rating			
Low	-0.009**	-0.016	-0.033***
	(-2.23)	(-1.61)	(-3.12)
Below average	0.004	-0.005	-0.029**
	(1.07)	(-0.83)	(-2.17)
Above average	0.003	0.009	-0.059***
	(1.11)	(1.13)	(-3.00)
High	0.019***	0.050***	-0.072***
	(3.15)	(2.64)	(-4.01)
1-month lagged monthly return	0.141**	0.439***	-0.123
	(2.16)	(2.87)	(-0.42)
1-month lagged log of fund size	-0.004***	-0.004*	0.011***
	(-4.80)	(-1.91)	(2.86)
1-month lagged standard deviation	0.028	0.086	1.056**
	(0.58)	(1.13)	(2.46)
1-month lagged alpha	0.203***	0.079	-0.420***
	(7.26)	(1.63)	(-2.65)
1-month lagged expense ratio	-0.505**	-1.106*	2.070
	(-2.37)	(-1.88)	(1.11)
Fund age	-0.001***	-0.001***	-0.000
	(-3.20)	(-2.99)	(-0.08)
Monthly fixed effect	Yes	Yes	Yes
Constant	0.094***	0.085*	-0.278***
	(4.94)	(1.95)	(-4.46)
Observations	3370	806	229
R2	0.064	0.090	0.419

Table 16: Net Fund Flows in Response to the Sustainability Rating by Fund Size

This table displays mutual fund flows in response to the Sustainability Rating, in sub-samples by fund size quintiles. All columns include the additional control variables lagged Star Rating, lagged monthly return, lagged standard deviation, lagged annualized alpha, lagged expense ratio, and fund age. All lagged variables are lagged by one month. Standard errors are clustered on month and fund level. T-statistics are in parentheses and *, **, *** represents significance at the 10%, 5% and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	q1	q2	q3	q4	q5	Retail After
1-month lagged Sustainability Rating						
Low	0.001	0.026	0.009	0.073***	0.019**	0.020***
	(0.05)	(1.31)	(0.68)	(2.87)	(2.53)	(2.60)
Below average	-0.015*	0.002	-0.000	-0.021*	0.004	-0.005
	(-1.85)	(0.21)	(-0.06)	(-1.84)	(0.99)	(-1.55)
Above average	0.009	-0.026*	-0.008	-0.013**	0.003	-0.008**
	(0.44)	(-1.91)	(-0.94)	(-2.18)	(0.67)	(-2.16)
High	-0.030**	0.003	-0.032**	-0.016***	0.006	-0.012***
	(-2.14)	(0.29)	(-2.40)	(-3.03)	(1.27)	(-3.30)
1-month lagged Star Rating						
Low	-0.001	-0.003	-0.013**	-0.004	0.006	-0.014***
	(-0.11)	(-0.37)	(-2.16)	(-0.46)	(0.49)	(-4.01)
Below average	0.007	0.011	-0.000	0.003	-0.003	-0.001
	(0.98)	(1.50)	(-0.05)	(0.39)	(-1.18)	(-0.38)
Above average	0.023*	0.005	0.003	-0.001	0.000	0.003
	(1.70)	(0.53)	(0.35)	(-0.10)	(0.15)	(0.97)
High	0.094***	0.077**	0.018*	-0.004	0.009**	0.023***
	(3.15)	(2.55)	(1.72)	(-0.60)	(2.12)	(3.84)
1-month lagged monthly Return	0.051	0.432**	0.195	0.222	0.080	0.199***
	(0.39)	(2.47)	(1.51)	(1.52)	(1.27)	(3.26)
1-month lagged standard deviation	0.275**	0.001	0.056	0.076	-0.053	0.063*
	(2.45)	(0.02)	(0.64)	(0.87)	(-1.44)	(1.70)
1-month lagged alpha	0.331***	0.250***	0.130***	-0.011	0.025	0.154***
	(3.88)	(4.36)	(3.68)	(-0.23)	(0.97)	(6.31)
1-month lagged expense ratio	-1.294*	-0.504	-0.067	-0.325	-0.413**	-0.401**
	(-1.81)	(-1.09)	(-0.15)	(-0.77)	(-2.10)	(-2.25)
Fund age	-0.002***	-0.002***	-0.000	-0.000	-0.000*	-0.001***
	(-3.01)	(-3.98)	(-0.52)	(-1.03)	(-1.88)	(-5.19)
Monthly fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Log Fund size						-0.003***
						(-4.25)
Constant	0.033	0.016	0.009	0.010	0.017***	0.075***
	(1.29)	(1.06)	(0.68)	(0.55)	(2.86)	(4.53)
Observations	830	698	845	1078	954	4405
R2	0.132	0.152	0.068	0.050	0.047	0.056

Table 17: Event Study

This table displays the average standardized abnormal fund flows $\overline{SAF_t}$ by Sustainability Rating and the event window of the first six months following the launch of the rating ($t = [0; 6]$). To estimate a benchmark for normalized fund flow for each individual fund, we regress the net fund flow on variables known to be important predictors of fund flow, as described by Del Guercio et al. (2007). We regress net flow on the average relative net flow to all funds at time t, and one-month lagged net fund flow to each fund, one-month lagged monthly return, the change in alpha from $t-2$ to $t-1$, and the squared change in alpha. We base the estimation on a window of 24 months prior to the launch of the rating on March 2016 ($t = [-24; 0]$). *, **, *** represents significance at the 10%, 5% and 1% levels, respectively

	Low		Below Average		Average		Above Average		High	
Event month	$\overline{SAF_t}$	$p-value$	$\overline{SAF_t}$	$p-value$	$\overline{SAF_t}$	$p-value$	$\overline{SAF_t}$	$p-value$	$\overline{SAF_t}$	$p-value$
1	0.015	0.34	0.003	0.66	-0.003	0.60	0.010	0.38	-0.003	0.54
2	0.040*	0.06	0.003	0.77	-0.011*	0.06	-0.012	0.05	-0.019	0.12
3	0.028	0.33	-0.012	0.19	0.005	0.66	-0.012	0.14	-0.002	0.82
4	0.051**	0.03	0.003	0.71	0.007*	0.07	0.000	0.91	0.004	0.51
5	0.020	0.22	0.000	0.92	0.006	0.27	-0.003	0.46	0.001	0.79
6	0.018	0.28	-0.001	0.88	0.000	0.95	0.007	0.42	0.027	0.29

Table 18: Investment Area
Funds With Low Sustainability Rating

This table displays the ten largest investment areas for funds with a low sustainability rating.

	Freq.	Percent	Cum.
Global	157	38.57	38.57
Norway	77	18.92	57.49
Sweden	68	16.71	74.20
Europe (North)	23	5.65	79.85
Europe	21	5.16	85.01
India	13	3.19	88.21
Global Emerging Mkts	11	2.70	90.91
Global ex Europe	11	2.70	93.61
China	7	1.72	95.33
Brazil	5	1.23	96.56

Table 19: Investment Area
Funds Whith High Sustainability Rating

This table displays the ten largest investment areas for funds with a high sustainability rating.

	Freq.	Percent	Cum.
Global	135	37.60	37.60
Pacific ex Japan ex Australia	34	9.47	47.08
Norway	32	8.91	55.99
Global Emerging Mkts	28	7.80	63.79
Asia Asia Pacific ex Japan	27	7.52	71.31
Europe (North)	23	6.41	77.72
Sweden	22	6.13	83.84
United States of America	15	4.18	88.02
Russia & CIS	14	3.90	91.92
Africa	13	3.62	95.54