

Do Finnish mutual fund investors value sustainability? An experiment examining ranking and fund flows

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Abstract

In this paper I present causal evidence that Finnish mutual fund investors place a positive value on sustainability. For an average Finnish mutual fund that means approximately over 63 000 € as a monthly net flow based on its Portfolio sustainability score. The evidences suggest that this observed flow is not due to higher portfolio returns but rather irrational performance expectations and nonpecuniary motives to invest in higher sustainability funds.

Keywords Sustainable investing, Finnish mutual funds, investor decision

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1. Introduction

In this decade sustainability has received a substantial amount of attention and publicity. In company's perspective it's however unclear how sustainability of the company affects investors' decisions. It can be assumed that some of investors view efforts towards sustainability as valuable and are willing to invest more money in more sustainable assets. Other investors possibly see sustainability as a waste of time and effort while they believe that company's primary goal is to maximize profits. It's also reasonable to assume that such investors are present in the market that doesn't care or know about company's sustainability. While all of those investor types are likely to be present in the market it's still unclear what are the preferences of an average mutual fund investor in Finland. So, do Finnish mutual fund investors value sustainability? The topic is particularly interesting because based on Morningstar Sustainability Atlas¹ Finland is ranked in top tier in almost all sustainability measures. While Finland performs well in sustainability on a country level it's however unclear do investors actually value it. That is very important for companies and fund managers because if investors value sustainability then more sustainable companies and funds will grow and thrive while ones with a lower sustainability will shrink and die. Importance of sustainable investing is also emphasized by many multinational associations like UNPRI² and Eurosif³, which provide support and guidance for investors and fund managers in sustainable investing.

In March 2016 Morningstar published a new Sustainability rating for over 20 000 mutual funds.⁴ The Sustainability rating measures how a fund performs on sustainability basis and ranks the funds from 1 (worst) to 5 globes (best). The Sustainability rating made it easier for investors to understand and compare sustainability between funds. Reader should note that this kind of setting is rare in financial market when the event itself doesn't have any effect on fundamentals. Hartzmark and Sussman (2019) in their study points out that most studies of socially responsible investing focus on firm specific traits. In this paper I study do Finnish mutual fund investors value sustainability. I base my analysis on the funds sustainability's effect to funds net flow and also report effects on excess returns. The funds

¹ The Morningstar Sustainability Atlas can be downloaded from: <https://www.morningstar.com/lp/sustainability-atlas>

² United Nations Principles for Responsible Investment can be found from: <https://www.unpri.org/>

³ Eurosif and its principles can be found from: <http://www.eurosif.org/>

⁴ See more details of the Sustainability rating and the Portfolio sustainability score here:

<https://www.morningstar.com/articles/745796/introducing-the-morningstar-sustainability-rating-for-funds>

sustainability in this study is measured by the fund's Portfolio sustainability score which is provided to Morningstar by Sustainalytics. Sustainalytics is a market leading sustainability rating and research provider.⁵ To construct the Portfolio sustainability score the Portfolio controversy score is deducted from the portfolio ESG score. The Portfolio sustainability score measures how well the fund performs in ESG issues and is rated between 0 (worst) and 100 (best). The time period of this study is from January 2012 to August 2019. I use the initial publication of the Morningstar sustainability rating in March 2016 to split the time series and to measure do investors value sustainability more on recent time periods and did the Sustainability rating have any publication effect.

After the publication I find a positive correlation between the Portfolio sustainability score and fund flows which means that investors place a positive value on sustainability. This is also in line with recent literature like Hartzmark and Sussman (2019) and Białkowski and Starks (2016). When I assess the sustainability's effect on funds excess returns, I find an opposite relation. After the initial publication I found a negative correlation between fund's Portfolio sustainability score and excess returns resulting that higher sustainability funds perform worse. This is also in line with previous research like Muñoz et al. (2014), Utz and Wimmer (2014), Auer and Schuhmacher (2016) and Borgers et al. (2015). In addition, in their study Borgers et al. (2015) finds out that "sin stocks" yields higher returns because investors boycotting them and requiring higher returns to hold such investments which can explain part of the negative correlation.

Based on the sustainability's significant effect on fund flow I can reject the hypotheses that investors see sustainability as a negative or neutral characteristic. But it leaves open the reason why investors value sustainability and allocated more money to higher sustainability funds. In this paper I present three possible explanations for the phenomena. The first possibility is that investors allocate more money in higher sustainability funds based on rational performance expectations. I studied sustainability's effect on funds excess returns and found a negative correlation. Based on this finding I can reject the possibility that investors allocate more money on higher sustainability funds because of the higher expected returns.

⁵ See more of Sustainalytics from their web page: <https://www.sustainalytics.com/>

If the higher fund flows to higher sustainability funds are not driven by rational performance expectations, then investors must have other motives for allocation decisions. Other possible explanations are irrational performance expectations and nonpecuniary motives. In the study of Hartzmark and Sussman (2019) they performed a survey to study the investors perception of sustainability. They found out that investors associate higher sustainability with higher returns and with lower risk. In that study they also found that many investors have nonpecuniary motives to invest in higher sustainability funds. This can be seen as well in my study when sustainability has a positive correlation with fund flows and opposite with returns, investors are not investing to higher sustainability based solely on expected future returns. Also, a study from Białkowski and Starks (2016) supports this finding. Unfortunately, I am not able to prove which one, irrational performance expectations or nonpecuniary motives, have stronger effect on observed fund flows with Finnish investors.

My study relates most closely to recent literature examining how investors value the nonfinancial aspects of investments. While other studies concentrate closely to aspects of a certain subgroup of investors, like study of Muñoz et al. (2014), assessing the return differences between conventional and different Socially responsible investments, those subgroups only consist of investors that view sustainability as a positive attribute and gives a distorted picture how market views the same attribute. My study concentrates on how the Finnish mutual fund investors as a whole perceive the sustainability and did the Morningstar sustainability rating publication change how investors view the sustainability. Perhaps the closest studies in that field are made by Hartzmark and Sussman (2019) studying how the Morningstar sustainability rating publication affected the US investors behavior and by Białkowski and Starks (2016) finding that demand for Socially responsible investments have grown. More importantly in both they find that investors value sustainability mostly because of nonfinancial aspects of the investment product.

2. Literature review

In recent literature the sustainability has been well studied. Those studies mostly concentrate on companies and funds returns based on sustainability. However, results of the studies vary widely. Many studies find positive correlation between sustainability and returns like Friede et al. (2015), Henke (2016), Cheung (2011) and Berthelot et al. (2012). Friede et al. (2015) performed a research where they combined results from multiple studies. They found mixed results between sustainability and returns but concluded that the sustainability has mostly a positive effect on returns. Especially strong positive correlation was found in North America, emerging markets and non-equity asset classes. They also found that positive correlation is noticeable since the 1990s, but it seems that investors haven't fully noticed that effect. Henke (2016) studied the returns between different socially responsible bond funds and conventional funds. He found out that socially responsible bond funds perform better than their conventional peers and that the outperformance is more likely in recession or bear market periods. In his study he proves that the outperformance can be explained by the mitigation of ESG risks which is achieved by screening out bonds from corporations with poor corporate social responsibility activities. Cheung (2011) studied the effect of stocks inclusion and exclusion in Dow Jones Sustainability World Index (DJSWI). He found a positive but temporarily effect on returns if a stock is added to the index. In addition, he pointed out that exclusion from the Index resulted a rise in a stocks idiosyncratic risk. Finally, Berthelot et al. (2012) studied the sustainability effects on Canadian stocks returns. They found out that investors appreciate sustainability reporting and that have a positive effect on stock returns. They proved that "This premium stems from the anticipation of lower production costs or/and increased sales arising from a firm's involvement in sustainable development or from sophisticated communication strategies that can generate potential political benefits." However, Cheung (2011) points out that the worst-in-class exclusion might be better application for corporate social responsibility data than the commonly used best-in-class screening used by most funds.

While many studies propose a positive correlation between sustainability and returns there are also many that find an opposite effect. For example, studies like Muñoz et al. (2014), Utz and Wimmer (2014), Auer and Schuhmacher (2016) and Borgers et al. (2015) find a negative or no effect between sustainability and returns. Muñoz et al. (2014) studied the differences in returns between different

socially responsible funds and conventional funds. They found out that in non-crisis periods socially responsible investments underperformed their conventional peers and found no differences in performance in crisis periods. In the study they proved that socially responsible funds haven't been able to benefit from the narrow asset universe. They also note that alongside the financial returns the sustainability performance should be measured as well. Also, Utz and Wimmer (2014) didn't find a difference in returns between socially responsible and conventional funds. Their study resulted a valid point that maybe the screening in socially responsible funds isn't working as well as it should. Auer and Schuhmacher (2016) in their study evaluated the EU and Asian ESG investment strategies and found that an active investment strategy didn't provide a superior risk adjusted return. Additionally, they proved that investors in Europe pay the price for socially responsible investments in a form of lower risk adjusted return in some areas. Purely profit maximizing investors can't be satisfied with ESG based stock selection but ESG fund managers are able to provide a "filtered" market return. Finally, Borgers et al. (2015) find a positive relation between mutual fund returns and sin stock exposure. This is in line with investors and funds boycotting sin stocks making them yield better returns. Investors also require a premium for holding sin stocks because of social pressure. Borgers et al. (2015) also notes that funds shouldn't automatically aim to be more sustainable but to reflect their investors needs and wishes. Mackenzie and Lewis (1999) proved that investors are not willing to do compromises between profits and ethics.

The correlation between sustainability and returns is studied widely in recent literature. After all, the correlation between fund net flows based on sustainability have studied far less while the flows are more reasonable measure for how investors perceive sustainability. In that field a few studies have been made like Hartzmark and Sussman (2019) and Białkowski and Starks (2016) which suggest a positive correlation between fund flows and sustainability. Hartzmark and Sussman (2019) studied the correlation between Morningstars Sustainability rating and US mutual funds fund flows. They found a positive correlation resulting more money being allocated to higher sustainability funds. Also, Białkowski and Starks (2016) made the same observation of higher sustainability receiving higher fund flows. Both of the studies concluded that these fund flows can be explained by investors nonfinancial consideration rather than rational performance expectations. Hartzmark and Sussman (2019) proved that the fund flows are generated mostly by investors associating the sustainability with higher returns

at lower risk and by non-pecuniary motives of investors, like altruism and warm glow. In same study they also proved that higher sustainability funds performed worse. This is line with other literature like Muñoz et al. (2014), Utz and Wimmer (2014), Auer and Schuhmacher (2016) and Borgers et al. (2015) presented above. Lumme et al. (1996) performed a study of Finnish venture capital investors. They found out that venture capitalists who had an altruism in part of their investment decision process resulted much lower returns when compared to other venture capitalists.

In many financial settings investors are assumed to be rational. The investors behavior is studied in many publications, like Cohen and Kudryavtsev (2012), Kahneman and Riepe (1998), Kent et al. (2002) and Hirshleifer (2001), and most of them have found errors and biases in investor behavior. Investors tend to interpret the signals on market wrong and mis value investment products. These can also be seen in studies related to sustainability investing. In studies of Hartzmark and Sussman (2019) and Białkowski and Starks (2016) investors allocate more money on higher sustainability investments when same time the correlation between sustainability and returns is found to be negative. Investors wrongly interpret sustainability's effect on returns, or their investment decisions are influenced by something else than just a pure profit maximizing.

These other things than pure profit maximizing influencing investors decisions can be non-pecuniary motives and emotions. In many studies like Dellavigna et al. (2012), Sankar et al. (2016), Koschate-Fischer et al. (2012), Theotokis and Manganari (2015) and Derwall et al. (2011) market participants are found to have many different non-pecuniary motives affecting their decisions. Perhaps the most important non-pecuniary motives are altruism, warm glow and social pressure. These nonpecuniary motives explain the found effects of sustainability in my study and provides evidences that market participants are not pure profit maximizers but value also a non-financial aspects of investments. Also, in studies like Hartzmark and Sussman (2019) and Białkowski and Starks (2016) nonpecuniary motives are found to have effect on how investors value sustainability. It's important to notice that alongside non-pecuniary motives emotions have influence on investors decisions. The effect of emotions and affects heuristics to decision making is studied by Slovic et al. (2004)(2005)(2007) and Finucane (2000). They find that affect and emotion of the stimulus many times takes the place of reasoned analysis in decision making. This supports the fact that investors allocate more money in higher sustainability funds while the sustainability's effect on returns is negative in the case of Finnish mutual funds.

It's important to notice that recent literature has focused to study the differences between conventional funds and funds under some sustainability mandate or specified investment target based on sustainability. In their study Utz and Wimmer (2014) points out that a sustainability mandate doesn't guarantee a higher fund overall sustainability but helps to avoid the least sustainable funds. The study of Utz et al. (2015) founds out that funds under some sustainability mandate or specific sustainable investment goal could be even more sustainable before having to consider the tradeoffs in returns or risks. It's also important to understand the differences of fund managers and retail investors interpretation of sustainability. The study of Duuren et al. (2016) points out that fund managers concentrate mostly on investments governance part while retail investors consider environmental aspect and sustainability to be more important.

3. Portfolio sustainability score

From the beginning of 2012 the Morningstar's Portfolio sustainability score has been available for Finnish mutual funds.⁶ The score is meant to indicate for the investor how sustainable a fund is based on its underlying assets. The score gives investor a possibility to compare funds and clearly point out differences. The Portfolio sustainability score also unmask the truth between different Sustainable responsibility mandates making it easier to investors to put their money where their values are.

The Portfolio sustainability score is formed from Portfolio ESG score and Portfolio controversy score. The Portfolio ESG score measures how well portfolio performs based on Environmental, Social and Governance issues. The Portfolio controversy score measures the controversies experienced by the portfolio based on portfolio weight and severity. The Portfolio sustainability score is formed by deducting one fifth of the Portfolio controversy score from the Portfolio ESG score.

Higher ESG score is better than lower and opposite for the Controversy score resulting that a higher Portfolio sustainability score is better than a lower in a term of sustainability. The Portfolio sustainability

⁶ See more details of the Portfolio sustainability score and Sustainability rating here:
<https://www.morningstar.com/articles/745796/introducing-the-morningstar-sustainability-rating-for-funds>

score is displayed as a number between 0 and 100 and the score indicates how well a portfolio performs based on Sustainalytics ESG methodology.

Reader should note that other papers might refer to similarly named variable that is constructed differently. In this thesis I use the Portfolio sustainability score presented above as a measure of funds sustainability. I split the time series half on March 2016 when Morningstar published the Morningstar sustainability rating to more than a 20 000 mutual funds. The Sustainability rating made funds sustainability easier for investors to compare and understand. In this thesis I use the Sustainability rating only to split the time period to see has there been any publication effect and also to see has there been any changes through the time series of my data. The Portfolio sustainability score was the first measure used to produce the Sustainability rating but after 2016 Morningstar has changed the underlying measure few times.⁷ It's important to notice that after the change of underlying score the funds Sustainability rating is not available for prior change period.

Sustainability has become a popular term but lacks a clear and accurate definition. In the Hartzmark and Sussman (2019) study they arranged a survey to find out what people think when they are asked "which elements of a company's business practices they believe "sustainability "refers to". The most popular answer was Environmental, for example pollution prevention and recycling, which was chosen by 79 % of the respondents. The second and third highest ranked answers was Products and Human rights but both of them was chosen less than a half of respondents. The survey was performed for US respondents, but it can be assumed that the differences between options would be approximately same in a case of European investors. Based on the results investors pay mostly attention to the Environmental part of ESG areas and leave two other components, Social and Governance, for lower meaning. This is also supported by the study of Duuren et al. (2016) where they found that retail investors concentrate mostly on environmental and sustainability areas while fund managers view the

⁷ See the details of the changing here: <https://www.morningstar.com/articles/900970/changes-make-sustainability-rating-more-consistent>

governance part most important. Its positive to note that based on the Hartzmark and Sussman (2019) survey only 2 % of respondents didn't know what business practices becoming more sustainable mean.

AUM Covered	Fund	ESG Score – Controversy Deduction = Sustainability Score		Category % Rank	Sustainability Rating	
94.7	A	58.1	12.3	45.8	40	
98.5	B	57.2	6.1	51.1	29	

Figure 1.⁸ Example of the Portfolio sustainability score and The Sustainability rating

4. Data and statistics

All mutual fund data was provided by Morningstar. My data consists of 706 Finnish mutual funds between January 2012 and August 2019. Search criteria for funds have been that the fund must have domicile in Finland and it also must be traded in Finland. The base currency is chosen to be Euro and the fund must have the Portfolio sustainability score available. Also, non-surviving funds are included in the data set in order to avoid the survivorship bias. The data set is not anonymized and its presented in a monthly frequency. In base my analysis on fund level data and it didn't have major outliers. Clear marking errors have been manually cleared. The full data set can be loaded from Morningstar Direct.

All market data is taken directly from Kenneth R. French website.⁹ In regression models I use size, value, momentum and market excess return to build the Carhart four factor model. The risk-free rate of return is also taken from French site. All market factors are in European scale because most of funds in data invest in European market and Finland is also a part of that market. All market data is presented in a monthly frequency. Most important data variables are presented in table 1 and 2, before and after the initial publication of the Morningstar Sustainability rating, respectively.

My first main variable of interest, fund flows, is reported as a monthly fund level net flow in euros. Monthly level net flows are very volatile and can systematically vary based on fund characteristics, mainly on fund size. To provide a robust measure for monthly net flow I construct a standardized fund

⁸ The Figure 1 is from Morningstars web page: <https://www.morningstar.com/articles/745796/introducing-the-morningstar-sustainability-rating-for-funds>

⁹ Kenneth R. French website and data library can be found here: https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

flow variable to make sure that results are not driven by other fund characteristics. The standardized fund flow is constructed by dividing months net flow with prior month fund size. The standardized fund flow measures the percentual growth of the fund and makes flows between funds comparable. It also removes fund sizes impact to net flow, when normally larger funds have larger net fund flows.

My second main variable of interest is funds excess return. To construct this variable, I deduct risk free return from funds raw return. I am interested of how much return a fund can generate above the risk-free rate. Reader should note that in my analysis period risk free rates have been on very low level and in some months funds raw return equals funds excess return. This phenomenon can be seen especially at the beginning on my data set. Morningstar also provides their own calculations of funds excess return, but those returns are not calculated based on European risk-free returns but rather comparing to different benchmarks.

When looking the summary statistics of the data in tables 1 & 2, there can be found couple of interesting points. First, when comparing values of the Sustainability score before and after the initial publication of the Morningstar Sustainability rating there is not a big difference between average fund Portfolio sustainability score. This means that funds haven't changed their underlying assets towards more sustainable ones based on the publication of the Sustainability rating. In fact, there can be seen a deduction of around two points in a data after the publication, but this can also be caused by that after the publication there is more observation of the Sustainability score even the time period is much shorter. In other words, after the initial publication of the Sustainability rating Finnish mutual funds have been better rated based on the Portfolio sustainability score.

The second thing to notice on the statistic tables is the change in absolute net flows. Before the Sustainability rating publication absolute net flows have been positive on average but after the publication absolute flows have turned negative on average. As discussed above absolute net flows are very volatile and other fund characteristics such as fund size may have a large effect on it. That is the reason why I use standardized fund flow in this thesis. However, it is important to understand the difference between these variables and report both of them to get better understanding how Finnish mutual fund market has performed in the data set.

Table 1
Data summary statistics

This table presents summary statistics of the data for the evaluation period before the initial publication of the Morningstar Sustainability rating from January 2012 to February 2016.

	Min	Average	Median	Max	n
Portfolio sustainability score	34,06	53,31	54,18	65,53	11725
Fund size €	231 546,00	203 968 970,69	79 320 000,00	3 256 512 441,00	26131
Net flow €	-553 750 454,43	1 839 149,55	27 029,17	739 874 037,52	26183
Equity country Finland %	-0,173	14,495	0,780	99,979	19478
Asset allocated equity %	-4,718	76,420	95,963	135,450	23069
Asset allocated bond %	-17,599	15,520	0,000	121,850	23063
Fund Return %	-20,994	0,723	0,664	33,258	22233
Fund excess return %	-20,994	0,721	0,661	33,238	22225
Market excess return %	-12,310	0,652	0,290	7,450	35300
SMB %	-4,400	0,344	0,455	3,780	35300
HML %	-4,360	-0,214	-0,320	4,450	35300
WML (Momentum) %	-8,890	1,036	1,165	9,040	35300
Risk free return %	0,000	0,002	0,000	0,020	35300
Standardized fund flow %	-2,119	0,016	0,001	5,330	25495

Total number of observations = 350 607

Table 2
Data summary statistics

This table presents summary statistics of the data for the evaluation period after the initial publication of the Morningstar Sustainability rating from April 2016 to August 2019.

	Min	Average	Median	Max	n
Portfolio sustainability score	34,53	51,49	51,11	65,29	15731
Fund size €	249 422,00	276 302 247,54	116 462 755,00	3 467 737 502,00	21682
Net flow €	-772 694 580,13	-901 818,99	-19 380,93	608 858 067,76	21688
Equity country Finland %	0,000	13,203	1,149	100,929	17471
Asset allocated equity %	-0,078	74,249	96,226	147,611	21057
Asset allocated bond %	-37,298	18,981	0,000	129,665	21077
Fund Return %	-29,480	0,569	0,435	33,609	20316
Fund excess return %	-29,640	0,460	0,342	33,599	20293
Market excess return %	-8,540	0,491	0,590	6,200	28946
SMB %	-2,580	-0,087	-0,130	2,180	28946
HML %	-4,720	-0,019	-0,160	6,410	28946
WML (Momentum) %	-4,420	0,668	0,200	8,520	28946
Risk free return %	0,010	0,104	0,090	0,210	28946
Standardized fund flow %	-1,006	0,004	-0,001	9,246	21602

Total number of observations = 304 045

Third thing to note is fund excess returns. On average funds have performed better before the publication than after. Also, the market excess return after the publication has fallen when compared to before the publication average. This means that market on average is performing worse than before publication. When assessing the difference between Finnish mutual funds excess return and market excess return there can be seen that the Finnish mutual funds ability to beat the market on average has decreased. Notable is also the change in risk free rate into positive direction. Low risk-free rate can indicate problems in market and predict a lower economic growth in future. Therefore, a growing risk-free rate can be seen as a sign of economic recovery.

5. Do investors value sustainability?

A. Hypotheses

Morningstar's goal for publishing the sustainability rating was to make sustainability easier to understand and because they thought that investors would be interest in it. One assumption is that the Sustainability rating didn't receive any interest from investors, or they weren't aware of it, and because of that it didn't have any impact on fund flow attracted by the key variable Portfolio sustainability score. Based on the study by Hartzmark and Sussman (2019) after the publication Sustainability rating received as much Google searches as Morningstars popular Star rating. In their study Hartzmark and Sussman (2019) also note that the Sustainability rating didn't attracted any searches prior the initial publication meaning that investors didn't anticipate the publication.

Another valid hypothesis is that publication of the Sustainability rating didn't have significant impact on investor behavior because everything needed to construct the Sustainability rating was already available for investors. Sustainability information have been available for investors through many sources as well as firm specific information and fund holdings. So basically, when publishing the Sustainability rating Morningstar didn't bring any new information to the market but packed it into easier to understand and more comparable form.

Hartzmark and Sussman (2019) in their study also brought up the fact that “While investors did not respond to the ratings before their publication, it is possible that mutual funds predicted their publication and traded prior to the publication in an attempt to receive a high globe rating.” When looking into Finnish mutual fund statistics in Table 1 & 2 we can see that this kind of pre-publication trading have not happened. The Sustainability score range and average has remained on about the same level before and after publication. In this study I have the advantage that I can track the funds sustainability before and after the publication. This also makes possible to view how Finnish investors perceive the sustainability and is there any significant change in recent year or was there any publication effect by the Sustainability rating.

Third potential assumption is that Finnish mutual fund investors are very passive and therefore publication of the Sustainability rating didn’t have any impact on fund flows. Or it could be that Finnish mutual fund investors are long-term savers and are not willing to change their investment positions very easily. When considering the data statistics in Tables 1 & 2 net fund flows range is wide partly telling that there is deviation between monthly net flows. Also, the average net fund flow not being close to zero tells that Finnish investors are not so passive.

I measure do investors value sustainability based on the Portfolio sustainability score and standardized fund flow attracted by the score. My null hypotheses for these tests are that investors do not place any value on sustainability and sustainability have no effect on fund excess returns.

B. Results

Do investors value sustainability more on later time period in my data and did the initial publication of Morningstar Sustainability rating have a publication effect on mutual funds? I use the March 2016 to divide the time period in parts. I use the standardized fund flow to asses do investors value sustainability in Finnish mutual fund markets. Mutual funds provide a unique universe to assess the effects for multiple reasons; mutual funds contain a little undiversified risk and they are able to grow or shrink based on how investors view them. Other investment products like direct stock holdings lacks these features. When discussing the publication effect of the Sustainability rating reader should note that it

didn't change mutual funds underlying assets fundamentals. It only stated the information that was already available in different and perhaps easier perceivable form.

In Table 3 I study how Finnish mutual fund investors view sustainability in full sample by regressing the Portfolio sustainability score on standardized fund flow. I additionally examine what effect the Portfolio sustainability score had on fund excess returns. I use two different model in my study; Factor Model and Full model. The Factor model refers to Carhart four-factor model which includes four following factors: Market excess return, value premium, size premium and momentum factor. In the Factor model I use in this study the Portfolio sustainability score factor is added to the Carhart four-factor model. The Full model refers to model where I have added multiple fund specific factors to the Factor model. Most notable factors added are fund size and flow factors, funds percentual holdings in different asset classes and lagged return factors of 3, 6 and 12 months. I tested a different variation of the Portfolio sustainability score but only the raw Portfolio sustainability score yielded any results. The Full model differs a little depending on is the explained variable standardized fund flow or funds excess returns.

In Table 3 we see that investors place positive value on sustainability for the full time period based on the positive standardized fund flow estimate of $7,561 * 10^{-4}$ percentages with a T-value of 3,267. On average it means 93 711,38 € monthly net flow based on the fund's Portfolio sustainability score. The average effect is calculated by multiplying the Sustainability score estimate with the average fund's Portfolio sustainability score. Then the result is multiplied with the average fund size over the time period. So, through the full sample and time period I can say that Finnish mutual fund investors place a positive value on sustainability. This finding is in line with other studies like Hartzmark and Sussman (2019) and Białkowski and Starks (2016) which also find a positive correlation between fund flows and sustainability. In this paper I mostly make my conclusions based on the Full model because the Factor model can suffer from omitted variable bias and return incorrect estimates. Reader should also note that the R^2 values for flow measures are typically on very low level, but the model can still explain the phenomena.

When investors place a positive value on sustainability through the full time period the funds excess returns seem to behave a same way. Resulting that also for the funds excess return the Portfolio

sustainability score have a positive and significant estimate of $1,141 * 10^{-2}$ percentage with a T-value of 2,639. For an average Finnish mutual fund that means a positive effect of 0,597 percentage. This finding is supported by recent literature like Friede et al. (2015), Henke (2016), Cheung (2011) and Berthelot et al. (2012). When moving from Factor model to Full model there can be seen the Portfolio sustainability score estimate and t-value getting smaller and same time R^2 rising and alpha turning to non-significant. This suggests that Factor model might suffer from omitted variable bias.

Table 3
Regression summary statistics for full time period

This table presents the effect of the Portfolio sustainability score on fund excess return and standardized fund flow for full time period from January 2012 to August 2019. I use two different models to view the effect of the Portfolio sustainability score to funds excess return and standardized flow. The Factor model is Carhart four-factor model in which I added the Portfolio sustainability score as an extra explanatory variable. The Full model is a model where I have added several fund specific explanatory variables to the Factor model. Average effect refers to effect that the average Portfolio sustainability score makes to average mutual fund.

	Excess return		Standardized fund flow	
	Factor model	Full model	Factor model	Full model
Estimate	$1,854 * 10^{-2}$ (***)	$1,141 * 10^{-2}$ (***)	$1,388 * 10^{-3}$ (*)	$7,561 * 10^{-4}$ (***)
T-value	5,695	2,639	1,858	3,267
P-value	$1,250 * 10^{-8}$	$8,320 * 10^{-3}$	$6,320 * 10^{-2}$	$1,090 * 10^{-3}$
R^2	0,348	0,403	$1,362 * 10^{-4}$	$7,767 * 10^{-3}$
Number of controls	5	15	5	14
Alpha	-0,641 (***)	-0,761	$-5,872 * 10^{-2}$	$-5,478 * 10^{-2}$
T-value	-3,742	-1,445	-1,493	-1,943
Average effect	0,969	0,597	172 029,35 €	93 711,38 €

Star marks (*), (**), and (***) indicate significance at the 10%, 5%, and 1% levels, respectively.

Next, I examine the standardized fund flows and fund excess returns separately. I split the data in two by using the initial publication of Morningstar Sustainability rating on March 2016 as a separator to see if investors value sustainability more in recent time periods. And to asses did the Sustainability rating have any publication effect to Finnish mutual funds flows and returns.

In Table 4 I present the regression results for the standardized fund flow before and after the publication. There can be seen that the Factor model can't capture any significant effect between standardized fund flows and the Portfolio sustainability score. For the analysis here I use the Full model to explain the effects of the Portfolio sustainability score. In the Full model before the publication, the

Portfolio sustainability score doesn't have any significant impact to the standardized fund flows. But after the publication there can be seen a shift in the effect to standardized fund flows. The estimate is on a same level that it was before the publication but now the estimate of $4,449 * 10^{-4}$ percentage is significant at 5% level with a T-value of 2,10. Based on this result I can say that after the publication Finnish mutual fund investors have placed a positive value on sustainability but not before that. This finding is also supported by evidences of recent literature like Hartzmark and Sussman (2019) and Białkowski and Starks (2016) which both find positive correlation between sustainability and fund flows. Based on the average sustainability score and fund size that have a 63 295,05 € positive effect on monthly net fund flow for an average Finnish mutual fund. Reader should note that the Full model differs in control variables depending on is the explained variable standardized fund flow or fund excess return.

Table 4
Regression summary statistics for standardized fund flow

This table presents the effect of the Portfolio sustainability score on standardized fund flow for time periods before and after the initial publication of the Sustainability rating on March 2016. I use two different models to view the effect of the Portfolio sustainability score to funds excess return and standardized flow. The Factor model is Carhart four-factor model in which I added the Portfolio sustainability score as an extra explanatory variable. The Full model is a model where I have added several fund specific explanatory variables to the Factor model. Average effect refers to effect that the average Portfolio sustainability score makes to average mutual fund.

	Factor model		Full model	
	Before	After	Before	After
Estimate	$-2,552 * 10^{-4}$	$3,894 * 10^{-5}$	$5,688 * 10^{-4}$	$4,449 * 10^{-4}$ (**)
T-value	-0,664	0,252	1,156	2,097
P-value	0,507	0,801	0,248	0,036
R ²	$9,948 * 10^{-4}$	$1,777 * 10^{-3}$	$1,031 * 10^{-2}$	$8,002 * 10^{-3}$
Number of controls	5	5	14	14
Alpha	$3,108 * 10^{-2}$	$1,525 * 10^{-3}$	$-7,674 * 10^{-2}$	$-4,182 * 10^{-2}$ (*)
T-value	1,502	0,190	-1,260	-1,729
Average effect (€)	-27 749,39	5 539,92	61 848,96	63 295,05

Star marks (*), (**), and (***) indicate significance at the 10%, 5%, and 1% levels, respectively.

In Table 5 I present the regression results for funds excess return before and after the publication. Before the publication funds with higher sustainability have yielded higher returns based on the Portfolio sustainability score. In the Full model the Sustainability score has an estimate of $2,539 * 10^{-2}$

percentage with a T-value of 3,548 before the publication making the estimate highly significant at 1 % level. For average Finnish mutual fund that means approximately 1,354 percentage effect on excess monthly fund return based on the Portfolio sustainability score. Recent literature like Friede et al. (2015), Henke (2016), Cheung (2011) and Berthelot et al. (2012) have found the similar positive relationship between sustainability and returns. Reader should also note that the Finnish mutual funds haven't been able to generate positive alpha before the publication when the estimate is -3,270 percentage and significant at 1 %.

After the initial publication of the Sustainability rating results are considerably different. The Portfolio sustainability score has had a negative effect to the funds excess return. In the Full model the estimate for the effect is negative $-2,526 * 10^{-2}$ percentage with a T-value of -4,548 after the publication making the estimate significant at 1 % level. For an average Finnish mutual fund that means approximately negative effect of -1,30 percentage effect on monthly excess fund return based on the Portfolio sustainability score. This finding is also supported in recent literature like Muñoz et al. (2014), Utz and Wimmer (2014), Auer and Schuhmacher (2016) and Borgers et al. (2015) which provides similar results. After the initial publication of the Sustainability rating Finnish mutual funds have also been able to generate a positive alpha of 1,904 and significant at 1 % level. In the next section I will present multiple explanations why investors value sustainability and how sustainability can affect to funds returns.

Table 5
Regression summary statistics for excess return

This table presents the effect of the Portfolio sustainability score on fund excess return for time periods before and after the initial publication of the Sustainability rating on March 2016. I use two different models to view the effect of the Portfolio sustainability score to funds excess return and standardized flow. The Factor model is Carhart four-factor model in which I added the Portfolio sustainability score as an extra explanatory variable. The Full model is a model where I have added several fund specific explanatory variables to the Factor model. Average effect refers to effect that the average Portfolio sustainability score makes to average mutual fund.

	Factor model		Full model	
	Before	After	Before	After
Estimate	$4,1124 * 10^{-2}$ (***)	$-5,836 * 10^{-3}$	$2,539 * 10^{-2}$ (***)	$-2,526 * 10^{-2}$ (***)
T-value	7,325	-1,465	3,548	-4,548
P-value	$2,580 * 10^{-13}$	0,143	$3,900 * 10^{-4}$	$5,460 * 10^{-6}$
R ²	0,382	0,349	0,439	0,428
Number of controls	5	5	15	15
Alpha	-1,717 (***)	0,625 (***)	-3,270 (***)	1,904 (***)
T-value	-5,667	3,025	-3,696	3,007
Average effect (%)	2,192	-0,300	1,354	-1,301

Star marks (*), (**), and (***) indicate significance at the 10%, 5%, and 1% levels, respectively.

6. Why do investors value sustainability?

In this section I am going to present multiple possible reasons why investors place a positive value on sustainability after the initial publication of the Morningstar sustainability rating. It's possible that these reasons have combined effect to the sustainability's effect to the funds net flows or it is possible that only one of them accounts for its. The three main reasons which I will introduce next are rational performance expectations, naïve performance expectations and non-pecuniary motives. Alongside those three main arguments I present few possible explanations which could account in the background but are not likely to be the main drivers of the observed phenomena. In this point the reader should note that the main focus of this paper is on studying the effect of sustainability to the Finnish mutual funds flows and returns. I cover multiple explanations for the observed phenomena but because lack of data I can't conclude to only one explanation for the phenomena. Perhaps this could be a topic for another study.

A. Rational performance expectations

The first possible explanation for the observed higher net flows based on sustainability score is rational performance expectations. If investors expect that higher sustainability will yield higher returns, it's reasonable to assume that more money will flow to more sustainable funds. When looking at a Table 5 there can be seen actually an opposite effect to the funds excess return after the initial publication of the Morningstar sustainability rating. After the publication, the Portfolio sustainability score have had a significantly negative impact on funds excess returns. It seems unlikely that investors have interpreted wrongly the effect of sustainability for the full time period after the publication.

Assuming that the Finnish mutual fund investors are rational it could be that they have based their investment decisions solely to the fund's historical returns. In time period between the beginning of 2012 and the initial publication on March 2016 sustainability has had a positive and significant effect to the funds excess return. Assuming that the Morningstar sustainability rating had a publication effect it could be that Finnish investors noticed the positive effect of higher sustainability and invested more money to more sustainable funds. This could have continued to the extent that the prices of mutual fund share and the prices of underlying assets increased to the point that being more sustainable started to cause a negative effect to the funds returns. It's very unlikely that market would misprice the effect of the sustainability for the full time period. If the markets have mispriced the sustainability before the publication, there should be a temporary correction movement after the publication when investors started to pay more attention to sustainability. Based on the significance of the Portfolio sustainability score estimate for funds excess return I can rule out that there wasn't just temporary correction, but the effect remains for the whole period after the Initial publication. Other possibility for the negative effect after the publication is that funds started to trade prior the information of the becoming publication of the Morningstar sustainability rating to get better Sustainability score. That way the negative effect for fund return could have been caused by the funds competing for high sustainability investments causing their prices to increase. When assessing the data summary statistics in Tables 1 & 2 there is no sign of funds getting more sustainable based on the average Portfolio sustainability score. That way I can rule out that higher sustainability funds yielding lower returns is not caused by funds competing for more sustainable investments. The reader should note that after the

publication there is more observations of the fund's Portfolio sustainability scores although the time period is shorter. It could be that after the publication more assets are being rated and those have been categorized with a lower Sustainability score causing the average Sustainability score to remain on a same level than before the publication. This could potentially hide the funds competing for higher sustainability investments but that's very unlikely. Based on points described above it seems that the rational performance expectations can't explain the higher net flows based on sustainability I have observed.

B. Irrational performance expectations and Non-pecuniary motives

It's possible that the observed flow to higher sustainability funds is caused by investors irrational performance expectations or investors non-pecuniary motives. By irrational performance expectations I mean investors wrongly associating higher sustainability with higher returns at lower risk. Non-pecuniary motives refer to the investor's investment decision process. For some investors it could be that they don't make their investment decisions based on pure profit maximation. In their decisions for example altruism or knowing that they are investing responsible can be important.

In Hartzmark and Sussman (2019) study they measured these two possibilities by making survey for a presentative group. In that survey they studied how respondents view the interaction between sustainability, returns and risk. They found out that significant part of respondents associated higher sustainability with higher returns at a lower risk which refers to irrational performance expectations. In second phase of the survey they asked from respondents did they think about sustainability factors when making the investment decisions. They found out that also non-pecuniary motives affect to the investment decisions. These aspects are supported also in other studies like Białkowski and Starks (2016) finding that investors decisions are affected by nonfinancial consideration and studies of Dellavigna et al. (2012), Sankar et al. (2016), Koschate-Fischer (2012), Theotokis and Manganari (2015) and Derwall et al. (2011) finding that market participants have many different non-pecuniary motives influencing their decisions. That can also be seen in my data and results. Both irrational return expectations and non-pecuniary motives are associated with higher net flow to more sustainable funds without higher returns based on sustainability being detected. After the initial publication Finnish

mutual funds with higher sustainability have generated higher net flows but the sustainability has had also a negative effect to the fund's excess returns on that period. This signals that the higher net flows are based on either one or both irrational performance expectations and non-pecuniary motives. Based on the studies mentioned above I can assume that both of them affect to investors decision making process but because of the lack of the data can't state which one is more important in Finnish investors process.

One thing that can't be left without attention is the publication effect of the Morningstar sustainability rating. Its notable that just after the initial publication higher sustainability funds started to generate higher net flows. Based on the Hartzmark and Sussman (2019) study the Sustainability rating received a lot of attention based on the Google searches after the publication but not before it. One reason for that could be that the Sustainability rating packed the funds sustainability information in easier to understand form. Other reason for the publication effect could be that the Morningstar is a reliable operator on mutual fund market. When Morningstar publishes something new it gets a lot of attention and could indicate a positive sign for an investor solely based on company's good reputation. So, the publication effect received by the Sustainability rating was mainly based on the sustainability factor the rating was intended to capture and on positive attention it received by investors. It's also notable that matters related to sustainability have gained even more attention in recent years for example in media. One thing driving the results could be the investors becoming more aware of their affect to the surrounding world and willingness to try to change it for the better. This relates to the non-pecuniary motives described above but could be caused partly by the attention that sustainability has gained in recent years.

7. Conclusions

In this paper I have presented evidences that Finnish mutual fund investors place a positive value on sustainability after the initial publication of the Morningstar sustainability rating. The analysis is based on the Portfolio sustainability score which is provided by Morningstar and constructed by Sustainalytics. I found that average Finnish mutual fund received approximately over 63 000€ monthly net flow based

on its Portfolio sustainability score with a high significance. This proves that majority of the Finnish mutual fund investors place a positive value on sustainability.

This kind of setting is rare in financial market. The Morningstar sustainability rating didn't provide a shockingly new information to the market, but it packed the information in easier to understand form and gained a lot of publicity. As a result of this event I was able to examine the effect of sustainability to the funds net flows and returns. Based on the findings I was able to limit the possible explanations for the observed phenomenon in few.

The three main explanations for the observed phenomena are rational performance expectation, irrational performance expectations and non-pecuniary motives. Based on the observed results the rational performance expectations can be rejected when higher sustainability funds attracted higher flows but performed worse. The two remaining explanations, irrational performance expectations and non-pecuniary motives, are more likely to explain the phenomena. These aspects are supported also in other studies like Białkowski and Starks (2016) and Hartzmark and Sussman (2019) finding that investors decisions are affected by nonfinancial consideration and studies of Dellavigna et al. (2012), Sankar et al. (2016), Koschate-Fischer (2012), Theotokis and Manganari (2015) and Derwall et al. (2011) finding that market participants have many different non-pecuniary motives influencing their decisions. These studies support my findings that investors are not investing based on solely profit maximizing when higher sustainability fund attracted higher flows but performed worse. Because of the lack of the data I can't state which one, irrational performance expectations or non-pecuniary motives, had greater impact on the observed fund flows. It's important to notice that the Morningstar as a provider of the rating could have an impact to the investor's reaction to the rating. The publicity received by the rating is also an important factor to consider.

The focus of this study has been on explaining do investors value the sustainability in Finnish mutual fund market. I have used the Morningstar definition of sustainability rather than trying to define it by myself. But it still important to understand how investors mainly interpret the sustainability. In the survey made by Hartzmark and Sussman (2019) investors focused mostly to environmental factors of sustainability and other elements of the ESG received substantially lower attention. Same findings were made in the study of Duuren et al. (2016) where they proved that fund managers concentrate mostly

on investments governance part while retail investors consider environmental and sustainability to be more important. However, it's difficult to determine what investors actually value when they view sustainability and different ratings measuring it. Perhaps this, with alongside explaining why Finnish investors value sustainability, could be a topic of another research.

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