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«The Relationship of Fund Outflows and Negative Performance in Socially Responsible Mutual Funds»

Empirical evidence from Norway, Sweden, and Denmark

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ABSTRACT

This study compares the sensitivity of money flows toward past performance between Socially Responsible (SR) and conventional mutual funds in Norway, Sweden, and Denmark from 2007 to 2016. The data is analyzed using several Ordinary Least Squares (OLS) regressions. We first apply raw monthly returns and then both raw and risk-adjusted long-term returns as performance measures. No empirical evidence was found to suggest that SRI outflows are less sensitive to past negative monthly performance than conventional fund outflows. On the other hand, the empirical study indicates that SRI inflows are less sensitive to previous positive monthly returns than conventional inflows. We contribute to the existing mutual fund literature by examining the relationship of fund flows and past returns in the Scandinavian SR mutual fund industry. We also contribute to the current literature by applying monthly data and longer returns of 3 years. Regarding long-term performance, we cannot find any empirical evidence that implies that SRI money flows are less responsive to past performance than conventional flows. It seems that for Scandinavian responsible funds the flow-performance relation is not so different than that of conventional funds, which differs from the results of previous studies.

Keywords: Socially Responsible Investment (SRI), mutual funds, fund flows, investor behavior

Abbreviations: ESG: Environmental, Social, and Governance; Eurosif: The European Sustainable Investment Forum; GSIA: Global Sustainable Investment Alliance; SR: Socially Responsible; SRI: Socially Responsible Investment or Sustainable, Responsible and Impact Investing; US SIF: The United States Sustainable Investment Forum.

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1. Introduction

It is surprising that the first ethical fund offered to the public was created in Sweden in 1965, as it is popularly believed that Socially Responsible Investment (SRI) emerged in the US during the 1970s. In fact, the US needed six more years before creating its first Socially Responsible (SR) mutual fund (Bengtsson, 2008; Renneboog et al., 2008a). Later, due to environmental concerns, the first environmental funds established in Scandinavia were offered in Sweden and Norway in the late 1980s. On the other hand, Denmark offered its first environmental fund after ten years. At the beginning of 1990s, social concerns regarding weapons, tobacco and alcohol arose and funds with broader screening criteria were developed in Scandinavia (Bengtsson, 2008). These investment screens represent what is called negative or exclusionary screening. That is the oldest type of SRI strategy, in which a fund avoids investing in specific industries. Later in the mid-2000s, gambling and pornography were added as being exclusionary fields of investment (Renneboog et al., 2008a).

Denmark's evolution of SRI is worth highlighting. During the late 90s, pension funds were raising equity from the French oil company, Total, which was proven to be financing the military dictatorship in Burma. This event was highly criticized and caused SRI to become popular in Denmark and the first non-environmentally responsible fund was established in 1999 in Denmark (Bengtsson, 2008). For a detailed timeline with the most important SRI events across Scandinavia see Table 1 in the Appendix. Apart from environmental and social filters, other issues are also highly important nowadays, such as responsibility, sustainability, transparency, and the governance of enterprises resulting from a wide number of business scandals (Renneboog et al., 2008a; Scholtens and Sievänen, 2013).

We are interested in mutual funds that are domiciled in Norway, Sweden, and Denmark, since they are innovators in responsible investing. The first Norwegian environmental funds set the foundations of the so-called positive or Best-in-Class screening (Bengtsson, 2008). That is the selection of the best performing companies within a specific industry based on social, environmental, and ethical standards (Renneboog et al., 2008a). In addition, the well-known

Norwegian Governmental Pension Fund (GPF) came from the Environmental fund Norway[1], which was established in 2001. That was an SRI pension fund utilizing both positive and negative screening, and aimed at being sustainable for the generations to come. Moreover, Norway influenced the international SR guidelines and principles that are widely adopted today by institutional investors. Finally, around half of Scandinavian (and mostly Norwegian) investors supported the international guidelines of the UN and those of the Organization for Economic Co-operation and Development (OECD) in the mid-2000s (Bengtsson, 2008). Therefore, these three Scandinavian countries are chosen to be studied in this thesis, as being pioneers in SRI.

According to the United States forum for sustainable investment (US SIF), SRI is defined as: "an investment discipline that considers Environmental, Social and corporate Governance (ESG) criteria to generate long-term competitive financial returns and positive societal impact" (USSIF, 2017). Terms such as responsible investment, sustainable investment, socially responsible investment or sustainable, responsible and impact investing can be used interchangeably (GSIA, 2016).

During the past decade, a rapid growth in SRI is noticed. According to the latest study of Global Sustainable Investment Alliance (GSIA), SRI professionally managed assets account for $12.04 trillion in Europe at the start of 2016, increased by 11.7% from 2014. Total SRI assets in the US is $8.72 trillion in 2016 and is increased by 33% since 2014 (GSIA, 2016). The same figures for 2007 are $3.77 and $2.71 trillion for Europe and the US respectively[2], showing that SRI more than tripled during the last decade. In addition, the shares of Europe and the US in worldwide SRI remain unchanged between 2007 and 2016 and are about 53% and 38% respectively. These numbers show that Europe's contribution to responsible investing is very significant (Eurosif, 2008; GSIA, 2016).

Moreover, global SRI assets under professional management comprise 26 percent of those professionally managed worldwide, signaling that responsible investing is gaining strength across

[1] After three years of its creation, the Environmental fund Norway merged with the Governmental Petroleum Fund and in 2006 they formed the Norwegian Governmental Pension Fund (GPF). (Bengtsson, 2008)
[2] For both figures, the exchange rate as of 10/09/2008 is used.

financial markets in the globe. Another characteristic that applies to most parts of the world is that institutional investors manage most of the assets invested in the industry (GSIA, 2016).

Investment managers have various reasons to consider investing in SRI. Some embrace responsible investing following ethical principles, requests from clients, and specific personal, corporate, or community goals. It is important to highlight that SRI investors seek high economic reward, but at the same time they believe that ESG issues should be accounted for and aim for sustainability. Nowadays, that it is common belief that ESG factors are material in financial performance, SRI becomes more popular. Moreover, in Europe the most important motivations for investing in SRI are corporate responsibility and risk management (Eurosif, 2016; US SIF, 2017).

Moving to the SRI strategies implemented today, negative and positive screening (or exclusions and Best-in-Class respectively) comprise the oldest types. In addition, further practices have been developed in the recent years such as: norms-based screening, ESG integration, sustainability themed investing, impact investing, corporate engagement, and shareholder action (Eurosif, 2016; GSIA, 2016). As it is not necessary for the scope of this thesis to discuss in detail the different strategies, only a brief explanation of the SRI practices is provided in Table 2 in the Appendix.

Next, we focus on the SRI strategies used in Scandinavia. Figure 1 in the Appendix illustrates those of Norway, Sweden, and Denmark in 2013 in millions of Euros and Figure 2 presents those of Sweden and Denmark in 2015. Negative screening is the most dominant practice, while positive screening is shrinking drastically. Norms-based screening, engagement, and ESG integration (mostly for Sweden) are the next widely implemented SRI tactics. As shown in the figures, most of the popular strategies have grown between 2013 and 2015 (Eurosif, 2014; Eurosif, 2016).

Our interest is to test whether performance has an impact on fund flows between mutual funds that follow and those that do not follow SRI strategies. In addition, we want to compare ethical and conventional investor behavior that follows from better and poorer fund performance. The stimulus is if ESG factors integrated in sustainable funds result in a different investor behavior. Our motivation is to see if ethical investors are less willing to withdraw money from SRI funds when past returns are negative compared with conventional fund investors. Thus, the main research question of the thesis is: Are fund outflows less sensitive to past negative returns in SR mutual funds when compared to those of conventional funds? Apart from this research question, we

examine if past positive returns lead to a smaller increase in fund inflows when compared with conventional inflows. These questions might be explained by the fact that the fund flow-performance relationship may be weakened by ESG factors, as suggested by Benson and Humphrey (2008), and Ghoul and Karoui (2017).

Other recent papers examining the relationship between performance and SRI fund flows are those of Bollen (2007) and Renneboog et al. (2011). Bollen (2007) finds a stronger connection between flows and past positive returns for SR funds than for conventional funds, while Renneboog et al. (2011) finds a different result for various screening types. For past negative returns, they both find a weaker relationship, although Bollen (2007) does not find a robust result on this. In addition, Benson and Humphrey (2008) find that investors take into account both a short and a long investment time horizon. Most of the research is performed on US data.

To check how past performance affects net flows of responsible mutual funds, we conduct an empirical study with data from the platform of Morningstar Direct. We collect monthly data for a period of ten years starting in January 2007 and lasting until December 2016. The dataset includes 375 survivor-bias free open-end equity mutual funds domiciled in the above mentioned Scandinavian countries. However, this number varies during the sample period, as new funds emerge and other cease operation. Our analyses treat 75 funds as being ethical for the whole sample period.

Our methodology is based on Ordinary Least Squares (OLS) regressions or linear regressions, with the dependent variable being the net flows of a fund. We assume that net flows are an estimation of fund inflows and outflows as it was not possible to collect these data separately. This seems to be a common problem in the fund literature. Negative net flows are indicative of large outflows. Similarly, when net flows are positive, we infer that large inflows are invested into the funds.

To answer our research questions, we compare the fund flow sensitivity on lagged returns for short and long-time periods. First, we run an OLS regression with only short-term performance and later with both short and long-term returns. We only find empirical evidence that SRI fund flows are less responsive to lagged positive monthly returns. No evidence is found to infer that inflow-positive long-run performance relation is weaker for SRI funds than for conventional funds. Also, we cannot find significant coefficients for SRI funds' raw negative returns of both monthly and of

past 3 years to imply that SRI investors care less about negative performance than conventional investors. Similar results are found when we replace long-term raw performance by risk-adjusted returns with Alpha and Sharpe Ratios. Since the results are mixed, there seem to be no special treatment for SRI funds in Scandinavia.

We contribute to the literature by expanding the research on the flow-performance relationship in the Scandinavian mutual fund industry. Moreover, we apply monthly data frequency, as Cashman et al. (2014) propose that it provides a better explanation of the fund flows attributes, while quarterly and yearly periodicity is more widely used. Lastly, we include both lagged by one month and by 3 years returns for performance measures.

Our paper is structured as follows: In section 2, the theory and the literature review related to the topic is summarized. In section 3, the hypotheses examined are presented. Section 4 describes the data sources, the sample selection, as well as the dependent and the independent variables for the empirical study in Scandinavia. Section 5 explains the methodology used in the analysis. In section 6, the results drawn are interpreted for Scandinavia and in addition, for each country separately. Lastly, section 7 describes the conclusions of the study and a final discussion is made.

2. Theory and literature review

The current mutual fund literature related to responsible investment focuses mostly on whether SRI affects mutual fund performance and this has been a significant and long debated research question. Some studies suggest that ESG factors cause responsible funds to underperform when compared with conventional funds (e.g. Renneboog et al., 2008b; Hong and Kacperczyk, 2009; Ghoul and Karoui, 2017). However, other papers find that SRI does not result in better or worse performance for responsible funds (e.g. Hamilton et al.,1993; Statman, 2000; Bauer et al., 2005; Humphrey and Tan, 2014).

How past performance affects conventional fund flows is broadly answered in the literature and it is mainly agreed that the relationship between flows and performance is positive. Moreover, it has been suggested recently that the connection between past performance and fund flows in not linear, but rather convex. One recent study utilizing 28 countries is conducted by Ferreira et al. (2012). Observing equity funds from 2001 to 2007, they believe that the flow-performance relationship may differ among countries. They propose that the convex relation does not hold outside the US, while being less convex in more developed countries, where investors are more educated and more sophisticated. This applies to our Scandinavian countries, which have highly educated investors.

A master thesis by Hansen and Steffensen (2013) is the only paper analyzing exclusively Norwegian mutual funds and it focuses on the period from 2006 to 2012. They can explain flows easier when previous returns are positive than when they are negative. They conclude that higher past positive returns result in higher inflows for Norwegian conventional mutual funds.

Although the research regarding how past performance affects cash flows in SR funds is limited, we managed to collect existing papers. Bollen (2007) examines a sample of survivor-bias free mutual funds including 187 SRI funds in the US market for the period from 1961 through 2002, and uses yearly returns to measure performance. His study shows that SR fund flows are more sensitive to past positive returns than conventional fund flows. He also suggests that SR cash flows are less sensitive to past negative performance, although this result is not as strong for positive performance. Therefore, he concludes that responsible investors gain utility from purchasing the SRI attribute, especially in the case of past positive performance. Finally, Bollen (2007) suggests that SR investors may be more loyal, because the SRI flow volatility is lower than in conventional

funds. This is a relevant research paper studying the SRI industry, because it covers a long time period and analyzes all SRI funds developed until 2002 in the US.

Also examining the US market, Benson and Humphrey (2008) analyze 148 SRI funds from January 1991 to September 2005. They contend that investors are concerned with both short and long-term returns when choosing investment funds and therefore they include returns of both monthly and annual frequency as performance measures in their regression. They show that SRI fund flows are less sensitive to past returns than conventional fund flows and that investors do account for both short and long investment horizons. In addition, their results suggest that SRI investors have a restricted number of fund choices that satisfy their ethical criteria. Therefore, they are not willing to shift between funds resulting in less flow movements for SRI funds.

Renneboog et al. (2011) analyze 295 SRI and two samples of 590 conventional funds in 21 countries, including the US, several European countries, together with Sweden, Australia, and Japan. They focus in the period from January 1992 to December 2003. Renneboog et al. (2011) suggest that the sensitivity of SRI flows to past positive returns depends on the different types of screening strategies. When social screens are applied, the inflow-past goods performance relationship is less sensitive than that of conventional funds. However, the flows into environmentally-screened funds are more sensitive to lagged positive performance than conventional flows. Those results might lead to the fact that the flow-return relation of SRI funds is specific to different countries and cultures for past positive performance and investors value various types of social and ethical issues differently. Moreover, they find that money flows into SRI funds are less sensitive to past negative returns than the flows into conventional funds. This also indicates that there are non-financial factors affecting investor decisions.

The most recent related paper, to our knowledge, is written by Ghoul and Karoui (2017) who empirically study 2,168 equity funds in the US from 2003 to 2011. They draw a similar conclusion as Benson and Humphrey (2008), that the relationship between money flows and past performance in SRI funds is weaker than that in conventional funds. In addition, Ghoul and Karoui, in contrast with Bollen (2007), reach the conclusion that ethical investors do not appear to be more loyal than conventional investors.

Since little is known about SRI investor behavior, we try to shed light on the topic. Studies have found that both SRI and conventional investors chase past returns. Capon et al. (1996) find that past performance is the most important factor for investors when selecting funds. Sirri and Tufano (1998) also emphasize that investors base their investment decisions on past raw returns. The same applies to Scandinavian investors, as found recently by Rieker (2015).

In basic finance theory, the selection of an investment is exclusively based on past performance and investors attitude towards risk (Marinelli et al., 2011). The tradeoff between risk and return is well known in finance. Therefore, except for raw returns, other performance measures include risk-adjusted returns. Hamilton et al. (1993) utilize monthly excess returns measured by the Alpha ratio when studying SR funds. Chavalier and Ellison (1997) also mention that investors of mutual funds are interested in maximizing risk-adjusted returns. Moreover, the Sharpe ratio can be used as an alternative return, as it measures the return in excess of a risk-free rate and accounts for return volatility (Tkac, 2001).

The current literature provides little indication that investors pay attention to non-financial factors. As mentioned in the introduction, ESG criteria is becoming increasingly important, because they affect the long-term performance, and rational investors should account for them when selecting funds. We try to find if investors evaluate ethical criteria as much as they do for performance measures.

Investor behavior might also be better explained by utilizing data of monthly frequency rather than quarterly or yearly, as most studies do when examining cash flows in the mutual fund industry. Two papers that use monthly data are known to us. The first is by Keswani and Stolin (2008) who employ UK data, and the second is by Cashman et al. (2014) who use US data. Cashman et al. (2014) find previous cash flows to be the most important factor that determines future flows.

The paper of Cashman et al. (2014) utilizes both net flows as well as inflows and outflows, and emphasize that with this method investor behavior can be observed in more detail. In addition, what is worth pointing out is that the previous two studies and that of Hansen and Steffensen (2013) are the only papers found to utilize cash inflows and outflows separately, while the broader mutual fund literature uses a combined measure, the net flows. The reason might be that they have

trouble gathering data on inflows and outflows. Therefore, analyzing inflows and outflows is not common in the mutual fund literature.

In our thesis, we aim at identifying the relationship of mutual fund flows and past returns between SRI funds and conventional funds, as similarly addressed by Bollen (2007) and Renneboog et al. (2011). This relates to investor incentives followed by fund performance. We therefore aim to contribute to the mutual fund literature related to the attributes that affect fund flows, as well as investor behavior for the Scandinavian mutual fund market in particular.

3. Hypotheses

With our first hypothesis, we seek an answer as to whether money flows of responsible funds are less sensitive to past positive performance when compared with flows of conventional funds.

Hypothesis 1: Money inflows of SRI funds are less sensitive to previous positive fund performance than those of conventional funds in Scandinavia.

We expect that the relationship of SRI fund inflows-lagged positive performance to be weaker than that of conventional funds in Scandinavia. Renneboog et al. (2011) find that when funds have positive returns, flow sensitivity to returns is less strong for funds when social screens are applied than for conventional funds. Moreover, Benson and Humphrey (2008) and Ghoul and Karoui (2017) argue that flow sensitivity to past returns is weakened by SRI strategies. Ghoul and Karoui (2017) argue that the more concerned investors are about responsibility, the less strong their sensitivity to fund performance should be. Only one study, to our knowledge, supports the opposite view and this is by Bollen (2007). This paper has the problem of having a short history of data on SR funds, since the number of SRI mutual funds is small prior to 1992. More specifically, as Bollen (2007) shows, in 1992 only 26 ethical funds are included in his study and this number is still low in 1996, just 77 funds. Therefore, we expect to find what the majority of the more recent literature finds.

Our second hypothesis consists the main research question of our thesis.
Hypothesis 2: Money outflows of SRI funds are less sensitive to past negative fund performance than those of conventional funds in Scandinavia.

Renneboog et al. (2011) find significant evidence that flows of SRI funds are less sensitive to past negative performance than those of conventional funds. Therefore, investors in SRI funds are less willing to withdraw money than those in conventional funds when funds have performed poorly. In other words, the relationship of outflows and poor performance in SRI funds is weaker than that in conventional funds. In addition, the papers of Benson and Humphrey (2008) and Ghoul and Karoui (2017) find a similar result as mentioned earlier. Moreover, Bollen (2007) supports the same, but his empirical evidence is not as robust as that of Renneboog et al. (2011).

The formation of both hypotheses represents our prediction that money flows of ethical funds are less sensitive to past performance compared to those of conventional funds. Higher positive returns (or lower negative returns) should not attract necessarily a larger amount of inflows (or should not result in higher outflows) as it is the case for conventional funds. The reason is that ethical investors might be influenced not only by past performance, but also by other non-financial factors, such as sensitivity to the environmental factor, when choosing mutual funds.

4. Data

4.1. Data sources

The main data source used in our thesis is the Morningstar Direct investment analysis platform. Morningstar Direct provides global data on fund characteristics such as returns, fund flows, expense ratios, inception date of a fund and sustainability scores. The scores are hard to obtain and are of high importance for our thesis. Moreover, Morningstar offers the most complete and correct information that exists on the Scandinavian market. In addition, the platform provides with comparable figures between the different funds, for example all the variables expressed in currency are presented in Norwegian Krone (NOK). Finally, the database was used in the study of Bollen (2007) as well.

Moreover, we gather information on expense ratios from each fund's webpage and previous funds' reports. Morningstar Direct lacks information on the specific variable, allowing for data collection from other sources. By visiting each fund's website, we collect the ratio for about 5,000 fund months and this increased the total size of months for processing.

4.2. Sample selection

In order to examine how investors behave depending on mutual fund performance and the return effect on net flows, we acquire monthly data on open-end equity mutual funds pertaining to years 2007 through 2016 in Norway, Sweden, and Denmark (henceforth Scandinavia). Therefore, money market, bond and index funds are ignored. The initial sample includes in total 1932 funds that invest in stocks both in the countries they are domiciled and abroad as well.

To avoid survivorship bias, we include both surviving and "dead" funds. Ignoring funds that ceased operation during the sample period can lead to unreliable results. The reason is that the survivorship bias overestimates fund performance (Rohleder et al., 2011). Therefore, both "dead" funds and those that merged with other funds are included in our sample.

Some of the funds in our initial sample have the same FundId[3] on Morningstar Direct. However, they represent different share classes (e.g., "A", "B", "C") and the way to distinguish between them on Morningstar is the SecId[4]. The classes differ between each other on the fees and expenses that are charged to investors[5]. A main difference is that a fund of share class A normally imposes a front-end load, which is a fee paid when the investor buys shares of the fund, while class B demands instead a deferred load which is a fee paid when the shares are sold (FINRA, 2008).

To avoid multiple counting of returns, since the share classes of the same FundId invest in the same securities and have the same returns before loads and fees, we keep the most representative share class available and eliminate the rest. Thus, we keep the class with the highest total net assets (TNAs) when more than one share classes are identified following among others Gaspar et al., (2006). This leads to the elimination of 303 share classes, making the FundId unique from now on.

We then exclude 214 funds that are registered in other base currencies than the Norwegian Krone, Swedish Krona, and Danish Krone. These funds are called offshore and their objective is to attract investors outside Scandinavia and thus the probability that Scandinavian investors will be interested in them is low. Therefore, the offshore funds are irrelevant for our research question, as we focus on domestic investors (Rieker, 2015).

Continuing we drop the funds for which data on TNAs and/or returns are not available for none of the months in our sample period. Moreover, we require that the number of stocks held by each fund is above 25, as an average for the whole sample period, following the approach of Borgers et al. (2015). Both approaches together remove 389 funds from our initial sample.

[3] Morningstar identification code of a fund

[4] Morningstar identification code of a share class

[5] Four types of costs exist in the mutual fund industry: Front-end and deferred loads, which are paid at the purchase or the sale of shares respectively. Operating expenses that consist of management fees, Rule 12b-1 fees, and "other" expenses. Those other include among others transfer agent fees, securities custodian fees, shareholder accounting expenses, legal fees, and auditor fees. The third, account fees are composed of switching fees, redemption fees, and account maintenance fees. The last, trading costs consist of brokerage fees, bid–ask spreads, and market impact costs. (Haslem, 2010)

Our list of funds is then restricted to those that have at least 2 years of history on performance to ensure sufficient monthly observations for processing. The same approach is followed among others by Bollen (2007), Ferreira et al. (2012), and Ghoul and Karoui (2017). Thus 216 funds with duration of reported data of less than 2 years are deleted, leaving 810 funds in total for analysis.

Next, we describe the filtering process, we followed, which resulted in our final sample size of 375 funds. Out of the 810 funds, 134 are listed as Socially Responsible (SR) on Morningstar Direct's platform based on the Socially Conscious variable (which takes the qualitative value of yes or no and is described further in section 4.3.3). Then we combine the Morningstar Portfolio Sustainability Score (which is also described in section 4.3.3 in detail). The score is available for 655 funds, resulting therefore in the exclusion of 155 funds from our analysis. This score varies from 35.08 to 64.69 for our sample and has a median of 52.13. Following a similar approach as Ghoul and Karoui (2017), when a fund has a yes on the Socially Conscious variable and has above or equal to the median Portfolio Sustainability Score, it is listed as an SRI fund. In contrast, when the Socially Conscious variable is a no and, in addition, the Sustainability Score is below the median, then the fund is listed as conventional.

During this process 280 funds have to be eliminated, since the Socially Conscious variable is not consistent with the Portfolio Sustainability Score. In other words, for those 280 funds, Morningstar either lists them as Socially Conscious, but the Sustainability score is below the median or lists them as conventional, but the score is high (or above the median). Finally, the original field of 134 SRI funds is thus reduced to the subset of 75 funds and the size of conventional funds is narrowed to the subset of 300 funds forming our final sample size of 375 funds.

We include 26,298 fund months in our analysis from January 2007 until December 2016. 4,822 fund months (18.34% of the total) correspond to SRI funds and 21,476 (81.66% of the total) to conventional.

4.3. Variables

The coming sections include a description of the variables used in our study. We begin with explaining the dependent variable of our analysis and then we elaborate on the two different methods we utilized to characterize a fund as socially responsible. Both ways are combined to

select the SR funds, as described above. Further, we interpret the independent variables and we clarify why we they are included in this thesis. In the end, a summary statistics of all the variables is presented.

4.3.1. Fund flows

To begin with, net flows are used as an estimate for fund outflows and inflows due to lack of obtaining the latter. Most of the studies that contain fund flows in their analyses and also research separately inflows and outflows use only the net flows in their methodology (e.g. Sirri and Tufano, 1998; Bollen, 2007; Renneboog et al., 2011; Ferreira et al., 2012). In contrast, a recent study made by Cashman et al (2014) on US data utilize net flows as well as inflows and outflows and that is quite rare in the mutual fund literature.

The definition of net flows in our paper is given by Morningstar Direct and is in accordance with Sirri and Tufano (1998) and others. Net flows (Fundflow) is defined as the net change in total net assets (TNAs) beyond reinvested dividends and is expressed in percentage. It is computed using the following equation:

$$\text{Fundflow}_{i,t} = \frac{\text{TNA}_{i,t} - \text{TNA}_{i,t-1} \times (1 + \text{Return}_{i,t})}{\text{TNA}_{i,t-1}} \quad (1)$$

Where:

$\text{TNA}_{i,t}$ and $\text{TNA}_{i,t-1}$ are the fund i's total net assets at the end of month t and t-1, and $\text{Return}_{i,t}$ is the raw return of fund i during month t. All the variables are in Norwegian Krone (NOK) and all the flows are assumed to occur at the end of each month.

To make sure that outliers do not affect our results, we remove observations of fund flows that appear to have extreme values. To select the outliers that need to be eliminated, we follow Bollen (2007), who removes an observation of fund flows when its percentage change is less than -90 percent or above 1,000 percent. As a result, 26 monthly observations are excluded.[6]

[6] This amount of fund months corresponds to an analogy of 0,12% of total observations of the net flows and this analogy is quite close with that found in Bollen's (2007) study (0,04%).

In addition, observations from January 2007 are not included in our regression due to lack of data on TNAs of December 2006. These data are necessary to calculate the net flows of January 2007 and therefore this month is not included in our analysis.

4.3.2. Performance measures

There are different ways of measuring fund performance and it is unsure if investors pay more attention on past raw or risk-adjusted return when making investment decisions. We use both raw and risk-adjusted performance in our paper.

According to Huang et al. (2012), although average investors in developed countries are expected to be more sophisticated, unsophisticated investors in terms of investing still exist. Those investors follow non-performance elements or blindly response to past returns. This means that investors do not necessarily use advanced performance measures when deciding cash deposits or withdraws in mutual funds. Moreover, Cashman et al. (2014) find that investors react to performance in a much shorter period of time than previous studies. Following Sirri and Tufano (1998) we include historical raw monthly returns, $Return_{i,t-1}$, in our base regression to measure fund performance. The returns are obtained from Morningstar's platform and account for fees such as management, administrative and 12b-1 (or marketing fees), but do not account for sale charges. The monthly return is calculated on Morningstar by "the change in monthly Net Asset Value (NAV), reinvesting all income and capital gains distributions during that month, and dividing by the starting NAV". (Morningstar, Inc, 2017)

Besides responding to returns of short period of time, investors might also evaluate returns of longer periods in order to observe fund performance. Benson and Humphrey (2008) use annual returns and one year lagged annual returns as long-term performance. We suggest that investors take into account both time horizons and in addition care also about a long-term performance of 3 years in order to evaluate a fund's ability of creating income more precisely. Therefore, apart from previous monthly returns, we use lagged 3-year returns, $LReturn_{i,[t-1;t-36]}$

The long-term performance measure employed is the rolling return of the previous 3 years. These are annualized returns from the cumulative ones, using geometrical method. According to Morningstar, annualized returns are more relevant and meaningful to fund performance than non-

annualized returns. Morningstar calculates cumulative returns for 3 years and then annualize them by geometrical method. (Morningstar, Inc, 2017)

As investors in developed countries are more sophisticated, they are expected to understand better mutual fund markets. Also, investors have access to many free or low-cost sources available online which report risk-adjusted performance (Ferreira et al, 2012; Huang et al, 2012). Therefore, they should utilize risk-adjusted returns, as many papers related to flow-performance do. Those studies use Alpha or Sharpe Ratio as performance measures (e.g. Hamilton et al., 1993; Sirri and Tufano, 1998; and Renneboog et al., 2011). We apply annualized rolling risk-adjusted returns of 3 years for both Alpha and Sharpe Ratio, as long-term performance, in order to test our main regressions' robustness, as well as to see if investors in Scandinavia chase those returns. Next, we explain how Morningstar calculates Alpha and Sharpe Ratio.

Alpha is used to compare fund performance with certain benchmark returns and to see if the fund outperforms the benchmark. Morningstar derives this return based on the Capital Asset Pricing Model (CAPM)[7] model and calculates Alpha as:

$$\alpha_M = R_i - [RF_i + \beta\,(R_m - RF_i)] \quad (2)$$

$$\alpha_A = \alpha_M * 12 \quad (3)$$

Where:

α_M is the monthly Alpha of a fund i, R_i is the return of fund i, RF_i is the risk free benchmark's return in month i[8], β is the beta coefficient of a fund portfolio and R_m is the market return. Morningstar calculates annualized Alpha (α_A) by multiplying monthly Alpha (α_M) by 12. (Morningstar, Inc, 2009)

Sharpe Ratio is a risk- adjusted performance measure which is used to measure the return reward per risk unit. Sharpe Ratio is calculated based on standard deviation and excess return[9].

$$\text{Sharpe Ratio}_M = \frac{\frac{1}{n}\sum_{i=1}^{n}(R_i - RF_i)}{\sigma_M^e} \quad (4)$$

[7] CAMP model: $R_p = R_f + \beta\,(R_m - R_f)$
[8] Morningstar uses risk free benchmark based on each funds' country of domicile.
[9] Excess return = $r_p - r_f$

$$\text{Sharpe Ratio}_A = \text{Sharpe Ratio}_M * \sqrt{12} \quad (5)$$

Where:

Sharpe Ratio_M is the monthly Sharpe Ratio of fund i, R_i is the fund's return in month i, RF_i is the risk free benchmark's return in month i, σ_M^e is the excess return's monthly standard deviation ($R_i - RF_i$). Morningstar calculates annualized Sharpe Ratio, Sharpe Ratio_A, by multiplying monthly Sharpe Ratio with the square root of 12. (Morningstar, Inc, 2005)

4.3.3. Methods of capturing the Socially Responsible funds

4.3.3.1. Socially Conscious variable

The definition of the Socially Conscious variable as given by Morningstar is: "Socially Conscious indicates if the fund selectively invests based on certain non-economic principles. Such funds may make investments based on such issues as environmental responsibility, human rights, or religious views. A socially conscious fund may take a proactive stance by selectively investing in, for example, environmentally-friendly companies, or firms with good employee relations. This group also includes funds that avoid investing in companies involved in promoting alcohol, tobacco, or gambling, or in the defense industry."

The value of the socially conscious variable is either yes or no and is provided for all the funds listed in Morningstar Direct. However, we cannot base our decision on whether a fund is sustainable and responsible solely on this variable. We think it is more correct to combine it with the Portfolio Sustainability Score to include in our analysis the degree of each fund's ESG performance.

4.3.3.2. Portfolio Sustainability Score

In our paper, we use Portfolio Sustainability Scores which are calculated based on the company-level and their ESG-related controversies (Morningstar, Inc, 2016). We use portfolio sustainability scores and Socially Conscious to divide our open-end mutual funds into two categories: SRI funds and conventional funds. We use the score as of December 2016 for all the previous years and this is an assumption we have to make, because Morningstar does not provide time series scores on this variable. The Sustainability Score is calculated as follows:

Portfolio Sustainability Score = Portfolio ESG Score - Portfolio Controversy Score (6)

In the following sub-sections, we explain how Morningstar and Sustainalytics, the ESG analytics provider, calculate the Portfolio ESG score and the Portfolio Controversy score.

4.3.3.3. Portfolio ESG score

Portfolio ESG scores is as an asset-weighted average of ESG scores which are normalized at company-level. The ESG scores at company level indicate how closely a company is addressing ESG issues.

$$ESG_p = \sum_{i=1}^{n} w_i ESGNorm_i \quad (7)$$

"ESG_p is the ESG score of the portfolio, n is the number of securities in the portfolio and W_i = the normalized asset weight on security i (total weight =1) " (Morningstar, Inc, 2016, p.1) keep page n.

Sustainalytics evaluates company-level ESG issues in comparison with their peer group. Since each peer groups' relevance to specific ESG issues differs, a special combination of indicators is introduced within each peer group to calculate the company-level ESG score. Therefore, in order to compare ESG scores between peer group and be able to evaluate diversified portfolio, the ESG scores of each peer group are normalized by using z-score transformation. The followings show how Morningstar calculate $ESGNorm_C$:

$$Zc = \frac{ESGc - \mu_{PG}}{\sigma_{PG}} \quad (8)$$

"ESGc is the ESG score of company C, M_{PG} is the mean of the ESG scores of the companies in the peer group and σ_{PG} is the standard deviation of the ESG scores of the companies in the peer group" (Morningstar, Inc, 2016, p.2)

'Morningstar uses z-scores to generate the normalized ESG score on a 0-100 scales, with a mean of 50."

$$ESGNorm_C = 50 + 10Z_C \quad (9)$$

"Normalized company ESG scores can be interpreted as follows

70+ = Company scores at least two standard deviations above average in its peer group

60 = Company scores one standard deviation above average in its peer group

50 = Company scores at peer group average

40 = Company scores one standard deviation below average in its peer group

30– = Company scores at least two standard deviations below average in its peer group"

(Morningstar, Inc, 2016, p.2)

4.3.3.4. Controversy score

ESG-related incidents in companies are tracked and categorized by Sustainalytics. The organization assesses the level of incident's impact on environment and society. The following shows how Sustainalytics calculates this score:

"$MControl_p = \sum_{i=1}^{n} w_i SCont_i$ (10)

$MControl_p$ = the Morningstar portfolio controversy score, $Scontr_i$ = the Sustainalytics controversy score of company i" (Morningstar, Inc, 2016, p.3)

As mentioned earlier, we select SRI funds based on portfolio sustainability scores and the socially conscious dummy variable. Here we need to highlight that, because Morningstar provides only the most recent scores of the portfolio sustainability scores variable, we assume that these numbers are the same for the whole period of study. Therefore, we accept that SRI funds maintain their status, as being ethical, during the whole study period and the relevant scores remain unchanged.

4.3.4. Control variables

We utilize five control variables that are widely used in similar studies of mutual funds. These are fund age, fund size, return volatility, expense ratio and number of stocks held by each fund. The first, fund age, is used to control for age effects on fund flows since its effect is shown to be important in both older studies, such as Sirri and Tufano (1998), and in very recent ones, such as Ghoul and Karoui (2017). The variable is calculated in months between the inception date, which is the date of creation, and the obsolete date for "dead" funds or the 31st of December 2016 (the

end of our sample period) for surviving funds. The inception date is easily accessible on Morningstar Direct. We use lagged fund age, $Age_{i,t-1}$, since we are interested in the effect of the earlier age on a fund's net flows.

The second variable is fund size. Following Renneboog et al. (2011), we define the fund size as the natural logarithm of the fund's TNAs. Again we are looking for a fund's flow sensitivity on previous fund size and thus the lagged variable $Size_{i,t-1}$ is included in our regression.

The third control variable is the lagged return volatility, $Risk_{i,[t-1;t-12]}$, which is the standard deviation of the previous 12 monthly returns. Volatility is a measure of total risk and is included in our study since Sirri and Tufano (1998) find some evidence that investors react on a risk change. More recent papers such that of Renneboog et al. (2011), Ghoul and Karoui (2017), and others, also account for risk.

Our fourth control variable is expense ratio, $Expense_{i,t}$, which is used to infer the outcome of current ratios on fund flows. The expense ratio is probably included in all the papers studying mutual fund flows. Sirri and Tufano (1998) find that flows are sensitive to fees and other papers such as Renneboog et al. (2011), Cashman et al (2014), Ghoul and Karoui (2017) also examine the effect of fees on fund flows. We gather data on expense ratio from Morningstar Direct. Yet the database provides with yearly data only. In order to fit the ratio in our dataset, we divide each ratio by 12 to get monthly numbers. The expense ratio is defined by Morningstar as the ratio of TNAs used to pay for operating expenses, management, administrative and 12b-1 fees (or marketing fees) and all types of asset-based costs except brokerage costs. Sale charges (front-end and deferred loads) are excluded. As mentioned earlier, since Morningstar lacks some observations of expense data, we go through each funds' websites and past reports to look for it.

The last control variable in our thesis is the number of stock holdings, $Nstocks_{i,t-1}$, which is the natural logarithm of lagged number of stocks. We include this variable as an indicator of fund size and reputation following Ghoul and Karoui (2017).

4.3.5. Summary statistics

Panel A in Table 3 below shows the summary statistics of the whole sample of our data. A positive mean of fund flows confirms a growth in asset under management in Scandinavia. While other variables seem to have some extreme data, fund flows have more balanced data since we remove the outliers, as described earlier.

Panel B and C present the descriptive statistics of conventional and SRI funds respectively. On average, fund flows and size of conventional funds are larger than those of SRI funds while conventional funds have lower mean of both short-term and long-term performance than SRI funds. This can be explained by the fact that conventional funds are much larger and diversified than the SRI funds. Conventional investors also have more investment options than SRI investors.

Table 3: Summary statistics of monthly variables.

Panel A: Whole sample	**Obs.**	**Mean**	**Std. Dev.**	**Min**	**Max**
Fundflow$_{i,t}$	26,299	0.005	0.127	-0.893	7.884
Return$_{i,t}$	26,299	0.693	4.827	-42.453	31.854
LReturn$_{i,t}$	21,765	7.648	13.300	-28.510	69.890
Alpha$_{i,t}$	25,386	1.545	8.038	-43.550	57.810
Sharpe Ratio$_{i,t}$	21,765	0.309	0.622	-1.190	2.290
Age$_{i,t}$	26,299	153.522	93.775	1.567	704.133
Size$_{i,t}$	26,299	20.342	1.435	9.126	26.358
Risk$_{i,t}$	26,299	4.368	2.052	1.110	19.870
Expense$_{i,t}$	26,298	0.117	0.047	0.008	0.389
Nstocks$_{i,t}$	26,299	134.371	201.416	0.000	2668.000
Panel B: conventional funds	**Obs.**	**Mean**	**Std. Dev.**	**Min**	**Max**
Fundflow$_{i,t}$	21,477	0.006	0.135	-0.893	7.884
Return$_{i,t}$	21,477	0.674	4.745	-42.453	30.905
LReturn$_{i,t}$	17,281	7.509	13.360	-28.510	69.890
Alpha$_{i,t}$	20,617	1.482	8.433	-43.550	57.810
Sharpe Ratio$_{i,t}$	17,281	0.308	0.635	-1.190	2.290
Age$_{i,t}$	21,477	153.348	96.922	1.700	704.133
Size$_{i,t}$	21,477	20.337	1.411	14.799	26.358
Risk$_{i,t}$	21,477	4.292	1.991	1.110	19.870
Expense$_{i,t}$	21,477	0.122	0.044	0.012	0.389
Nstocks$_{i,t}$	21,477	140.238	214.119	0.000	2668.000
Panel C: SRI funds	**Obs.**	**Mean**	**Std. Dev.**	**Min**	**Max**
Fundflow$_{i,t}$	4,822	0.004	0.086	-0.870	1.664
Return$_{i,t}$	4,822	0.781	5.173	-29.770	31.854
LReturn$_{i,t}$	4,484	8.181	13.055	-18.300	42.090
Alpha$_{i,t}$	4,769	1.816	6.033	-15.590	23.790
Sharpe Ratio$_{i,t}$	4,484	0.314	0.566	-0.910	1.810
Age$_{i,t}$	4,822	154.294	78.237	1.567	446.467
Size$_{i,t}$	4,822	20.365	1.536	9.126	24.224
Risk$_{i,t}$	4,822	4.709	2.272	1.160	15.200
Expense$_{i,t}$	4,822	0.095	0.053	0.008	0.258
Nstocks$_{i,t}$	4,822	108.238	127.383	0.000	794.000

Table 3 presents number of observations, mean, standard deviation, minimum and maximum values of monthly data of conventional and SRI funds: Fundflows (the net flows of funds in percentage), Return (raw monthly return), LReturn (annualized raw 3-year return), Alpha (long-term risk-adjusted returns in relation to market benchmarks), Sharpe Ratio (long-term risk-

adjusted returns calculated by dividing excess return by standard deviation), Age (number of months age of funds since inception date), Size (denotes for sizes of funds, calculated by doing natural logarithm of total net asset), Risk (standard deviation of lagged 12 monthly returns), expense (net expense ratio includes Management fee, 12b-1 fee and others), Nstocks (the natural logarithm of lagged number of stocks)

5. Methodology

To capture the sensitivity of flows to performance, we run several pooled ordinary least squared (OLS) regressions. We first use only short-term performance to explore the effects of monthly performance on fund flows in conventional and SRI funds. Later, we add annualized 3-year raw returns to examine impacts of long-term returns on money flows. Finally, in order to check the robustness of our regressions, long-term raw returns are replaced by Alpha and Sharpe Ratios as alternative performance measures.

5.1. Short-term performance

Our first regression is shown in equation (11), where all the control variables are included under the variable: $controls_{i,t-1}$. The main equation we use is equation (12) which contains lagged monthly returns as a performance measure. Furthermore, we include, in addition to lagged returns, lagged monthly fund flows in order to capture the impact of previous fund flows on current flows and we create equation (13).

$$Fundflow_{i,t} = \alpha + (\beta_1 A^+ + \beta_2 A^-)Return_{i,t-1} + (\beta_3 A^+ + \beta_4 A^-)Return_{i,t-1} * SRIdummy_i + \boldsymbol{\beta} * controls_{i,t-1} + \varepsilon_{i,t} \quad (11)$$

$$Fundflow_{i,t} = \alpha + (\beta_1 A^+ + \beta_2 A^-)Return_{i,t-1} + (\beta_3 A^+ + \beta_4 A^-)Return_{i,t-1} * SRIdummy_i + \beta_5 Expense_{i,t} + \beta_6 Risk_{i,[t-1;t-12]} + \beta_7 Nstocks_{i,t-1} + \beta_8 Age_{i,t-1} + \beta_9 Size_{i,t-1} + \varepsilon_{i,t} \quad (12)$$

$$Fundflow_{i,t} = \alpha + (\beta_1 A^+ + \beta_2 A^-)Return_{i,t-1} + (\beta_3 A^+ + \beta_4 A^-)Return_{i,t-1} * SRIdummy_i + \beta_5 Expense_{i,t} + \beta_6 Risk_{i,[t-1;t-12]} + \beta_7 Nstocks_{i,t-1} + \beta_8 Age_{i,t-1} + \beta_9 Size_{i,t-1} + \beta_{10} Fundflow\_lagged_{i,t-1} + \varepsilon_{i,t} \quad (13)$$

Where:

$Fundflow_{i,t}$ represents the net cash flows of fund i at the end of month t. All the data we obtain are in NOK and calculated by Morningstar. $Return_{i,t-1}$ is the total return[10] of fund i in month t-1[11]. A^+

[10] Total return is adjusted for expense ratio, but the ratio does not account for not sale charges.
[11] All the variables are presented in the same currency, the Norwegian Krone, NOK, and the conversion is performed in Morningstar's Database.

is an indicator variable that equals one when a fund's total return is positive or zero and A^- is a variable that takes the value of one when a fund's total return is negative. $SRIdummy_i$ is a dummy variable that equals one when fund i is an SRI fund and zero when it is a conventional fund.

Following Renneboog et al. (2011), the coefficients of equation (12) are defined as following: β1 indicates the sensitivity of flows to positive lagged returns for conventional funds. β2 captures the flow sensitivity to negative lagged monthly returns for conventional funds. Similarly, $(\beta_1+\beta_3)$ represents the flow sensitivity to a SRI fund's positive lagged monthly returns and $(\beta_2+\beta_4)$ denotes for the sensitivity of flows to a SRI fund's negative lagged monthly returns.

As control variables, we use $Age_{i,t-1}$ as the lagged number of months since fund i's inception, $Size_{i,t-1}$ as the fund i's size, which is the natural logarithm of TNAs at the end of month t-1, $Risk_{i,[t-1;t-12]}$ as the fund i's return volatility calculated by the standard deviation of monthly returns between the months t-1 to t-12, $Expense_{i,t}$ as the expense ratio of fund i, and $Nstocks_{i,t-1}$ is the natural logarithm of lagged number of stocks.

In addition to the previous variables, we apply the dependent variable lagged by one month, $Fundflow_{i,t-1}$, and we form equation (13). Cashman et al. (2014) find that lagged flows are more important than lagged returns in terms of explaining monthly flow changes.

5.2. Short-term and long-term performance

To examine investor behavior in both short-run performance and performance in longer periods, we add annualized lagged 3-year returns to regressions (12) and (13). The new regressions (14) and (15) are formed:

$$Fundflow_{i,t} = \alpha + (\beta_1 A^+ + \beta_2 A^-)Return_{i,t-1} + (\beta_3 A^+ + \beta_4 A^-)Return_{i,t-1} * SRIdummy_i + (\beta_5 A^+ + \beta_6 A^-) LReturn_{i,[t-1;t-36]} + (\beta_7 A^+ + \beta_8 A^-)LReturn_{i,[t-1;t-36]} * SRIdummy_i + \beta_9 Expense_{i,t} + \beta_{10} Risk_{i,[t-1;t-12]} + \beta_{11} Nstocks_{i,t-1} + \beta_{12} Age_{i,t-1} + \beta_{13} Size_{i,t-1} + \varepsilon_{i,t} \quad (14)$$

$$Fundflow_{i,t} = \alpha + (\beta_1 A^+ + \beta_2 A^-)Return_{i,t-1} + (\beta_3 A^+ + \beta_4 A^-)Return_{i,t-1} * SRIdummy_i + (\beta_5 A^+ + \beta_6 A^-) LReturn_{i,[t-1;t-36]} + (\beta_7 A^+ + \beta_8 A^-)\ LReturn_{i,[t-1;t-36]} * SRIdummy_i + \beta_9 Expense_{i,t} + \beta_{10} Risk_{i,[t-1;t-12]} + \beta_{11} Nstocks_{i,t-1} + \beta_{12} Age_{i,t-1} + \beta_{13} Size_{i,t-1} + \beta_{14} Fundflow\_lagged_{i,t-1} + \varepsilon_{i,t} \quad (15)$$

We keep other variables the same as in regressions (12) and (13). $LReturn_{i,[t-1;t-36]}$ is the annualized lagged 3 year returns. β_5 indicates the sensitivity of flows to positive lagged long-term returns for conventional funds. β_6 captures the flow sensitivity to negative lagged long-term returns for conventional funds. Similarly, (β_5+β_7) represents the flow sensitivity to an SRI fund's positive lagged long-term return and (β_6+β_8) denotes for the sensitivity of flows to SRI funds' negative lagged long-term return.

5.3. Alternative performance measures

In this part, we examine the robustness of regression (15), as it includes both the lagged returns and the lagged net flows. However, we replace the total long-term returns by risk-adjusted long-term returns: Alpha and Sharpe Ratio while other variables are kept the same. The following equations are created:

$$Fundflow_{i,t} = \alpha + (\beta_1 A^+ + \beta_2 A^-)Return_{i,t-1} + (\beta_3 A^+ + \beta_4 A^-)Return_{i,t-1} * SRIdummy_i + (\beta_5 A^+ + \beta_6 A^-) Alpha_{i,[t-1;t-36]} + (\beta_7 A^+ + \beta_8 A^-)Alpha_{i,[t-1;t-36]} * SRIdummy_i + \beta_9 Expense_{i,t} + \beta_{10} Risk_{i,[t-1;t-12]} + \beta_{11} Nstocks_{i,t-1} + \beta_{12} Age_{i,t-1} + \beta_{13} Size_{i,t-1} + \beta_{14} Fundflow\_lagged_{i,t-1} \varepsilon_{i,t} \quad (16)$$

$$Fundflow_{i,t} = \alpha + (\beta_1 A^+ + \beta_2 A^-)Return_{i,t-1} + (\beta_3 A^+ + \beta_4 A^-)Return_{i,t-1} * SRIdummy_i + (\beta_5 A^+ + \beta_6 A^- ShRatio_{i,[t-1;t-36]} + (\beta_7 A^+ + \beta_8 A^-)ShRatio_{i,[t-1;t-36]} * SRIdummy_i + \beta_9 Expense_{i,t} + \beta_{10} Risk_{i,[t-1;t-12]} + \beta_{11} Nstocks_{i,t-1} + \beta_{12} Age_{i,t-1} + \beta_{13} Size_{i,t-1} + \beta_{14} Fundflow\_lagged_{i,t-1} + \varepsilon_{i,t} \quad (17)$$

Where:

Alpha is the annualized 3-year Alpha, Sharpe ratio represents the annualized 3-year Sharpe Ratio, β_5 indicates the sensitivity of flows to positive lagged Alpha (Sharpe Ratio) for conventional funds, β_6 captures the flow sensitivity to negative lagged Alpha (Sharpe Ratio) for conventional funds. Similarly, (β_5+β_7) represents the flow sensitivity to an SRI fund's positive lagged Alpha (Share Ratio) and (β_6+β_8) denotes for the sensitivity of flows to SRI funds' negative lagged (Share Ratio).

6. Empirical results

6.1. Short-term performance

In this section, we provide the results from the main regression used to compare the sensitivity of flows and past performance between SRI and conventional funds. In more detail, as depicted in Table 4, coefficient $\beta_1 = 0.262$ means that if a conventional fund's monthly return increases by 1%, investors will increase their inflows to the fund by 0.262%. Coefficient $\beta_2 = 0.089$ shows that if a fund's short-term performance is reduced by 1%, investors will withdraw money from the funds by 0.089%. Both coefficients are positive and statistically significant. This result is in accordance with many studies such as those of Bollen (2007) and Renneboog et al. (2011).

In terms of hypothesis 1, for which we expect the SRI inflows to be less sensitive to positive returns than conventional funds, SRI funds flow sensitivity to previous positive returns is $\beta_1 + \beta_3 = 0.096$ and is smaller than $\beta_1 = 0.2294$. This result shows that Scandinavian SRI investors are less sensitive to past positive monthly performance than conventional investors. This is in line with the study of Renneboog et al. (2011), who also suggest that investors derive utility when buying environmental funds in the case that past returns are positive. However, Bollen (2007) finds the opposite outcome, that the flow sensitivity is higher for SR funds when returns are positive. Other studies, such as Benson and Humphrey (2008) and Ghoul and Karoui (2017) are closer to the result from our analysis.

For hypothesis 2, for which outflows of SRI funds are expected to be less sensitive to negative returns than conventional funds, we find that SRI flows are less sensitive when a fund performs poorly which is shown by the coefficient $\beta_2 + \beta_4 = 0.025$, because it is smaller than the coefficient of conventional funds, $\beta_2 = 0.089$. This coefficient means that SRI fund flows are withdrawn by 0.025% after 1% decline in returns. However, our coefficient is not considerably significant and therefore we cannot conclude that SRI outflows are less sensitive to poor past monthly performance when compared with conventional flows. This result is similar to that of Hansen and Steffensen (2013), who study Norwegian equities and cannot conclude on the flow sensitivity in the case of previous negative returns.

Our result for the second hypothesis is different than that of Renneboog et al. (2011), who show that SRI investors are less responsive to negative returns than conventional ones. There are three possible ways to explain this result: (1) SRI investors are not less sensitive to the negative performance than conventional funds; (2) or SRI investors might focus on long-term performance and do not follow the short-term performance; (3) otherwise, average investors could be unsophisticated as suggested by Huang et al. (2012).

In addition, we find that fund size substantially impacts fund flows. The size coefficient, β_9 = -1.768, indicates that the funds with larger size generally attract proportionally less percentage of inflows than the smaller ones. This result is in accordance with the findings from Sirri and Tufano (1998) and Renneboog et al. (2011). Other control variables are not significantly different from zero, as they might be ignored by investors.

Next, we add the previous monthly fund flows to equation (12) as an independent variable to create regression (13). The lagged fund flows' coefficient β_{10} = 5.533 shows that 1% increase in the lagged fund flows on average results in 5.53% increase in the current fund flows. This is in line with the conclusion from Cashman et al. (2014) that persistence in fund flows dominates the lagged returns' effect on next flows. This might be explained by the herd mentality, which means that some investors might be influenced by their peer's behaviors and thus their investment decisions are influenced by a market trend.

Including lagged fund flows also somewhat reduces the coefficients of performance. Performance coefficients of conventional funds, $\beta 1$ and β_2 slightly decrease to 0.252 and 0.082 respectively compared to these of the regression (12), where lagged fund flows are excluded. Moreover, coefficients of SRI funds corresponding to positive and negative monthly returns slightly decrease to 0.095 and 0.024, respectively.

In conclusion, we find that SRI fund flows are less sensitive to past positive monthly returns than conventional fund flows. We cannot find evidence that SRI investors are less sensitive to poor performance than their counterparts. Similarly, fund size still substantially impacts the fund flows but to a smaller degree. The rest of the control variables maintain to be insignificant and slightly change.

Table 4: Results on the sensitivity of flows to short-term performance in SRI and conventional funds

	Beta	Without lagged DV	With lagged DV
$Return_{i,t-1}*A^{+}$	β_1	0.262*** (5.96)	0.252*** (5.73)
$Return_{i,t-1}*A^{-}$	β_2	0.089* (1.83)	0.082* (1.7)
$Return_{i,t-1}*A^{+}$*SRIdummy	β_3	-0.166** (-2.27)	-0.157** (-2.15)
$Return_{i,t-1}*A^{-}$*SRIdummy	β_4	-0.064 (-0.91)	-0.058 (-0.83)
$Expense_{i,t}$	β_5	-4.857 (-1.05)	-5.026 (-1.09)
$Risk_{i,[t-1;t-12]}$	β_6	-0.098 (-1.17)	-0.089 (-1.08)
$Nstocks_{i,t-1}$	β_7	0.001 (1.14)	0.001 (1.18)
$Age_{i,t-1}$	β_8	0.015 (0.08)	-0.025 (0.13)
$Size_{i,t-1}$	β_9	-1.768*** (-12.96)	-1.840*** (-13.54)
$Fundflow\_lagged_{i,t-1}$	β_{10}		5.533*** (8.93)
Constant	α	0.352*** (2.07)	0.357*** (2.11)
Fund fixed effect		Yes	Yes
Time fixed effect		Yes	Yes
Number of observations		26,298	26,298
Adjusted R-squared		0.0042	0.0040

* Significance level of 10%

** Significance level of 5%

*** Significance level of 1%

The above table reports the results of regressions (12) and (13) in columns 3 and 4 respectively. $Fundflow_{i,t}$ is a proxy of inflows and outflows of mutual funds, $Fundflows\_lag_{i,t-1}$ is the previous monthly fund flows, $Return_{i,t-1}$ is the lagged monthly return, A^+ is an indicator variable that equals one when a fund's total return is positive or zero, A^- is a variable that takes the value of one when a fund's total return is negative, $SRIdummy_i$ is a dummy variable that equals one when fund i is an SRI fund and zero when it is a conventional fund, $Expense_{i,t}$ is the current monthly fee which contains 12b-1 fee (marketing fee), administrative, management fee and other fees (sale charges are excluded), $Risk_{i,[t-1;t-12]}$ is the fund's monthly return volatility which is calculated based on standard deviation of monthly return over the lagged 12 months, $Nstocks_{i,t-1}$ is the lagged number of stock holdings the fund owns, $Age_{i,t-1}$ is the fund age in months of the previous month, $Size_{i,t-1}$ is the fund size calculated by the natural logarithm of total net assets (TNAs). Column 3 presents the coefficient estimates of independent variables in regression (12) where lagged fund flows is excluded. Column 4 shows the results of regression (13) where lagged fund flows' effects is accounted for.

6.2. Short-term and long-term performance

In this part, we examine if SRI investors are less responsive to past long-term returns and past monthly returns than their counterparts. We explain the results of regressions (14) and (15) where long-term returns are added to regressions (12) and (13) to capture their effects on fund flows.

We start with the regression (14) where lagged fund flows are excluded. Table 5 below presents the estimates of determinants of fund flows. The coefficient estimates of monthly returns to flows are slightly different from those of the equation (12) but still maintain being significant at 1% level. The coefficient of positive annualized 3-year returns of conventional funds, $\beta_5 = 0.083$, implies that the conventional funds which have 1% increase in their lagged annualized long-term returns, experience an increase in inflows of 0.083% on average. This coefficient is highly significant. $\beta_6 = 0.083$, a coefficient estimate of negative lagged long-term performance, implies that when conventional funds experience a decline in performance of 1%, the corresponding outflows increase by 0.083%. The estimate of lagged negative monthly returns, those of previous positive and negative annualized 3-year return are significant.

Further, we find that when adding long-term performance, expense ratio and risk variables become significant at the 5% and 10% level, respectively. Expense is an important criterion for investors to invest in the funds. If the fund's manager raises expense by 1% the investors will withdraw money from the fund at 9.57% rate. The size variable remains to be highly significant in terms of explaining fund flows while other control variables seem to be ignored by investors.

Next, we include lagged fund flows in our regression (15). The lagged dependent variable continues to be a dominant determinant of fund flows. Other variables only marginally change from the regression (14). We therefore cannot infer both hypotheses that SRI money are less sensitive to positive and negative long-term returns than their counterparts. This result is in contrast with Bollen (2007) who concludes that the relationship of inflows and positive annual return is stronger in SRI funds than in conventional funds.

Table 5: Results on the sensitivity of flows to short and long-term performance in SRI and conventional funds

	Beta	Without lagged DV	With lagged DV
$Return_{i,t-1}*A^{+}$	β_1	0.245***	0.234***
		(5.59)	(5.34)
$Return_{i,t-1}*A^{-}$	β_2	0.128***	0.122**
		(2.65)	(2.55)
$Return_{i,t-1}*A^{+}$*SRIdummy	β_3	-0.155**	-0.143**
		(-2.25)	(-2.09)
$Return_{i,t-1}*A^{-}$*SRIdummy	β_4	-0.057	-0.052
		(-0.87)	(-0.79)
$LReturn_{i,[t-1;t-36]}*A^{+}$	β_5	0.083***	0.086***
		(6.4)	(6.58)
$LReturn_{i,[t-1;t-36]}*A^{-}$	β_6	0.123***	0.119***
		(3.27)	(3.16)
$LReturn_{i,[t-1;t-36]}*A^{+}$*SRIdummy	β_7	0.039	0.035
		(1.61)	(1.42)
$LReturn_{i,[t-1;t-36]}*A^{-}$*SRIdummy	β_8	-0.109	-0.096
		(-1.49)	(-1.32)
$Expense_{i,t}$	β_9	-9.576**	-9.678**
		(-2.1)	(-2.13)
$Risk_{i,[t-1;t-12]}$	β_{10}	-0.156*	-0.153*
		(-1.84)	(-1.80)
$Nstocks_{i,t-1}$	β_{11}	0.001	0.001
		(1.49)	(1.48)
$Age_{i,t-1}$	β_{12}	0.014	-0.002
		(-0.08)	(-0.01)
$Size_{i,t-1}$	β_{13}	-2.034***	-2.128***
		(-13.96)	(-14.60)
$Fundflow\_lagged_{i,t-1}$	β_{14}		6.583***
			(9.66)
Constant	α	0.420***	0.423***
		(2.31)	(2.33)
Fund fixed effect		Yes	Yes
Time fixed effect		Yes	Yes
Number of observations		21,764	21,764
Adjusted R-squared		0.0054	0.0087

* Significance level of 10%

** Significance level of 5%

*** Significance level of 1%

Table 5 reports the estimates of impacts of independent variable to fund flows. The third column show the result of regression (14) where lagged fund flows are excluded. The fourth column presents the result of regression (15) where lagged fund flows are included. $LReturn_{i,[t-1;t-36]}$ is the annualized lagged 3 year returns. The other variables are the same as in table 4.

6.2.1. Comparing between countries

In order to check the robustness of our result and being curious about investors' behavior differences in Norway, Sweden and Denmark, we repeat regression (15) based on each funds country of domicile. Table 6 presents the results of our regressions.

First, we see that investors in Scandinavian countries follow lagged fund flows to determine their investment in the next period. In Norway, amongst coefficients of performance, only coefficients of conventional funds lagged positive monthly (β_1) and annualized 3-year performance (β_5) are significant at 5% level and 1% level, respectively. The lack of significance in the other coefficients might be explained by the fact that we do not have sufficient number of observations (only 4324 monthly data) or investors in Norway only chase only past positive returns. Moreover, we see that increasing the funds' number of stockholdings by 1% results in an increase of 0.013% in inflows. This might be because investors in Norway would like to invest in more diversified funds.

In Sweden, SRI funds' positive monthly returns' coefficient, $\beta_1+\beta_3= 0.068$, is smaller than that of conventional funds, $\beta_1 =0.323$. Therefore, we infer that SRI fund flows are less sensitive to lagged positive monthly performance. Moreover, fund flows in Sweden are also impacted by fund's age. The positive coefficient of age variable, $\beta_1=0.563$, means that the older funds attract more inflows than younger ones. This result is different with findings from other papers (e.g. Sirri and Tufano, 1998; Renneboog et al., 2011). It is likely that investors in Sweden trust the older funds more than the younger ones.

Similar to Norway, in Denmark we see that investors of conventional funds chase positive monthly returns. Moreover, coefficients of long-term returns are also significant which shows that conventional investors in Denmark also chase long-term returns. This corresponds to Benson and Humphreys' (2008) finding, that investors care for both time horizons. In addition, investors seem to care for expense ratio which has a remarkable influence on the fund flows. Increasing by 1%

the expense ratio on average can cause a decrease of 15.602% in next fund flows. Moreover, investors in Denmark also respond to risk (or volatility of returns). A 1% decline in volatility of returns will result in an increase of 0.42% in inflows.

Further, the size and lagged flows of funds keep playing an important determinant to fund flows in all three countries.

Table 6: Results on the sensitivity of flows to short and long-term performance based on domicile

	Beta	Norway	Sweden	Denmark
$Return_{i,t-1}*A^{+}$	β_1	0.238** (1.96)	0.323*** (5.09)	0.198*** (2.97)
$Return_{i,t-1}*A^{-}$	β_2	0.084 (0.68)	0.199*** (2.76)	0.0731 (0.98)
$Return_{i,t-1}*A^{+}$*SRIdummy	β_3	0.018 (0.13)	-0.255*** (-3.08)	-0.039 (-0.14)
$Return_{i,t-1}*A^{-}$*SRIdummy	β_4	-0.186 (-1.49)	-0.081 (-0.89)	0.216 (0.81)
$LReturn_{i,[t-1;t-36]}*A^{+}$	β_5	0.085*** (2.69)	0.053** (2.42)	0.116*** (5.85)
$LReturn_{i,[t-1;t-36]}*A^{-}$	β_6	0.096 (1.00)	-0.062 (-1.08)	0.203*** (3.65)
$LReturn_{i,[t-1;t-36]}*A^{+}$*SRIdummy	β_7	0.059 (1.45)	0.018 (0.45)	-0.059 (-0.62)
$LReturn_{i,[t-1;t-36]}*A^{-}$*SRIdummy	β_8	-0.096 (-0.75)	-0.021 (-0.19)	0.247 (0.95)
$Expense_{i,t}$	β_9	-0.332 (-0.04)	-13.409 (-1.00)	-15.602** (-2.05)
$Risk_{i,[t-1;t-12]}$	β_{10}	-0.026 (-0.13)	0.155 (1.26)	-0.420*** (-2.95)
$Nstocks_{i,t-1}$	β_{11}	0.013** (2.00)	0.001 (0.83)	0.001 (0.92)
$Age_{i,t-1}$	β_{12}	0.09 (0.05)	0.563* (0.55)	-1.252 (-1.41)
$Size_{i,t-1}$	β_{13}	-2.522*** (-7.08)	-1.958*** (-6.23)	-2.187*** (-10.87)
$Fundflow\_lagged_{i,t-1}$	β_{14}	5.682*** (3.69)	2.760** (2.20)	8.448*** (8.68)
Constant	α	0.458** 2.29	-0.352 (-0.26)	1.678* (1.90)
Fund fixed effect		Yes	Yes	Yes
Time fixed effect		Yes	Yes	Yes
Number of observations		4324	6,777	10,663
Adjusted R-squared		0.019	0.0001	0.0002

* Significance level of 10%

** Significance level of 5%

*** Significance level of 1%

Table 6 shows the results of regression (15) after spliting our total sample based on the country the funds are domiciled. The variables are explained as in table 4.

6.2.2. Alternative performance measures

Up to this point, we could not find any evidence that SRI investors are less sensitive to positive long-term raw returns than conventional investors. To examine if investors are sensitive to risk-adjusted returns, we replace the 3-year raw returns with Alpha and Sharpe Ratio for our total sample and we present the results in table 7 below.

Replacing lagged annualized raw return by lagged Alpha and Sharpe Ratio somehow reduces the levels of significance of short-term performance. Similar to regression (15), we see that SRI investors are less responsive to positive monthly returns than their counterparts. Regarding long-term performance, we find that Sharpe Ratio has a stronger impact on money flows in conventional funds than Alpha does. Sharpe Ratio might be more widely used than Alpha by investors.

Moreover, while size remains an important criterion for investors, there are some interesting changes in risk factor. The risk variable has a more powerful influence on flows and its coefficients are more significant in both Alpha and Sharpe Ratio regressions. In addition, when Sharpe ratio is applied, we see that the coefficient of expense ratio is significant at 5% level. The coefficient estimate, β_9= 10.711%, shows that if the fund's expense is raised by 1%, investors withdraw money from the funds at 10.711% rate. Other variables are not significant.

Table 7: Results on the sensitivity of flows to short and risk-adjusted long-term performance

	Beta	Alpha	Sharpe Ratio
$Return_{i,t-1}*A^{+}$	β_1	0.240***	0.230***
		(5.35)	(5.27)
$Return_{i,t-1}*A^{-}$	β_2	0.094*	0.105**
		(1.91)	(2.18)
$Return_{i,t-1}*A^{+}$*SRIdummy	β_3	0.133*	-0.134*
		(-1.79)	(-1.95)
$Return_{i,t-1}*A^{-}$*SRIdummy	β_4	-0.067	-0.038
		(-0.95)	(-0.57)
$Alpha_{i,[t-1;t-36]}*A^{+}$	β_5 Equation (16)	0.156***	
		(6.50)	
$Alpha_{i,[t-1;t-36]}*A^{-}$	β_6 Equation (16)	0.100***	
		(3.42)	
$Alpha_{i,[t-1;t-36]}*A^{+}$*SRIdummy	β_7 Equation (16)	-0.006	
		(-0.10)	
$Alpha_{i,[t-1;t-36]}*A^{-}$*SRIdummy	β_8 Equation (16)	0.050	
		(0.45)	
$ShRatio_{i,[t-1;t-36]}*A^{+}$	β_5 Equation (17)		1.846***
			(6.14)
$ShRatio_{i,[t-1;t-36]}*A^{-}$	β_6 Equation (17)		2.034***
			(3.44)
$ShRatio_{i,[t-1;t-36]}*A^{+}$*SRIdummy	β_7 Equation (17)		0.561
			(1.09)
$ShRatio_{i,[t-1;t-36]}*A^{-}$*SRIdummy	β_8 Equation (17)		-0.21
			(-0.15)
$Expense_{i,t}$	β_9	-2.964	-10.711**
		(-0.63)	(-2.35)
$Risk_{i,[t-1;t-12]}$	β_{10}	-0.208**	-0.236***
		(-2.39)	(-2.74)
$Nstocks_{i,t-1}$	β_{11}	0.001	0.001
		(1.38)	(1.38)
$Age_{i,t-1}$	β_{12}	0.005	1.00e-04
		(0.03)	(0.00)
$Size_{i,t-1}$	β_{13}	-2.355***	-2.176***
		(-15.50)	(-14.73)

Fundflow_lagged$_{i,t-1}$	β_{14}	5.253*** (8.33)	6.627*** (9.73)
Constant	α	0.475** (2.64)	0.431** (2.37)
Fund fixed effect		Yes	Yes
Time fixed effect		Yes	Yes
Number of observations		25,385	21,764
Adjusted R-squared		0.0071	0.008

* Significance level of 10%

** Significance level of 5%

*** Significance level of 1%

Table 7 reports results from regressions shown in equations (16) and (17). Annualized 3-year $Alpha_{i,[t-1;t-36]}$ and $ShRatio_{i,[t-1;t-36]}$ are used as risk-adjusted long-term performance in regressions (16) and (17), respectively. Other variables are the same as in table 4.

7. Conclusions and discussion

In this paper, we study attributes that affect mutual fund flows and investors' incentives to select sustainable and responsible funds. Our main question is whether Scandinavian SRI outflows are less sensitive to funds' past poor performance than the conventional ones. Moreover, we are also curious whether SRI investors are less sensitive to lagged positive returns. In this part, we conclude on the main findings of our analysis and discuss its limitations. Next, we briefly present our contribution to the mutual fund literature, as well as suggestions for further research.

First, we investigate the fund flow sensitivity to past positive performance. We find that SRI investors care less about lagged positive monthly returns than conventional investors do in Scandinavia. This is in accordance with findings form Benson and Humphrey (2008), and Ghoul and Karoui (2017). In addition, Renneboog et al. (2011) find that fund flows of SRI funds chosen by social screening are less sensitive to positive performance. One way to explain it is that ethical factors affect Scandinavian investors in terms of choosing investments in the short-term and financial factors are not the only criterion Scandinavian investors are based on. Regarding long-term performance, we could not find evidence that SRI investors are less reactive to past positive long-run performance than their counterparts for both raw and risk-adjusted returns.

Second, we examine the fund flow sensitivity to past negative performance. Our coefficient estimates suggest that SRI investors are less sensitive to lagged negative monthly returns than conventional investors. However, those coefficients are not significantly different from zero. Also, the coefficient estimates of the negative raw and risk-adjusted long-term performance for SRI funds are not significant. Therefore, we conclude that there is no difference between SRI and conventional fund flows' sensitiveness to negative performance in Scandinavia. Our result is different with that of Renneboog et al. (2011), who confirm the weaker sensitivity. However, Bollen (2007) finds only weak evidence on the relationship of SRI outflows and negative returns.

When comparing between our Scandinavian countries, we find no evidence that SRI factors affect investors' decision in Denmark and Norway. However, we see that in Sweden, ethical investors are less responsive to past positive monthly returns. There might be some non-financial factors contributing in investor decisions in Sweden.

Overall, since our results are mixed, we cannot conclude that there are non-financial factors influencing SRI investment decisions in Scandinavia. Our results can be explained by the following: (1) The behavior between SRI and conventional investors to past performance is not different, thus it seems that there is no special treatment of SRI funds in Scandinavia. (2) The results are affected by some limitations, as listed below.

The first limit in our paper is the lack of getting outflows and inflows. These data are hard to obtain and rarely used in previous studies and we combat this issue by using net flows as a proxy for both. However, this might cause to misleading results and wrong interpretation.

The second limit is the lack of availability of the Portfolio Sustainability Score in Morningstar for 155 funds. We only know if these funds are SRI or conventional, but this is not enough as we need the score to compare it with the median and then list the fund as ethical or not ethical. One of these 155 funds that is excluded from our analysis, due to lack of obtaining the score, is Storebrand Vekst, which is among the top 5 performing SRI funds in Europe (Vigeo Eiris, 2016). The Portfolio Sustainability Score cannot be replaced by a different score, since it is created by Morningstar and Sustainalytics and we need to include the same measure for consistency in our analysis. Therefore, we should exclude those funds from our analysis.

In addition, it would be more accurate to include time series data of the Portfolio Sustainability Score. The reason is that the scores change during time and the funds that are above (or below) the median might as a result also differ from one year to another. However, time series data are not available for this variable and we assumed it to be the same for our sample period.

Lastly, Morningstar lacks many observations of the variable expense ratio. To deal with this problem, we go through each funds' websites and past reports to look for it. However, since some funds only provide the newest annual reports, there is still a considerable missing expense ratio data. This reduces the number of observations for our dataset and might lead to some slightly changes in our results. Out of 35.180 fund months of net flows, 26.299 are used in our analysis.

By conducting our study, we contribute by enriching a quite narrow literature regarding the flow-performance relationship of sustainable and responsible mutual funds. Particularly, since the first SRI fund was introduced in Sweden, we contribute by examining SRI investor behavior in

Scandinavia, while the existing studies are performed almost entirely with US data. Moreover, we promote the use of lagged monthly and lagged long-term returns of a duration of 3 years.

In the future, SRI funds are expected to grow more (Eurosif, 2016). We therefore hope that there will be more studies related to the topic, both in Scandinavia and abroad. There are some questions we suggest for further research: (1) Do SRI screening types affect investors' investment decisions? (2) Does investor behavior toward SRI funds change through time, following the growth of ESG concerns and SRI funds? (3) Do and how different cultures influence investor behavior in Scandinavia?

In conclusion, our findings are different from those of other studies. Our paper contributes to the understanding of SRI investor behavior in Scandinavian countries. We hope that in the future, there will be more studies related to the flow-performance relation and the SRI investor behavior.

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9. Appendix

Table 1: A timeline of important SRI events in Scandinavia

Year	Event
1965	AktieAnsvar Aktiefond established by the Temperance movement and the Baptist Church.
1980	Church of Sweden and Robur's launches Svenska Kyrkans värdepappersfond.
1988	Carlson WWF-fund established. First Scandinavian environmental/Best-in-Class-fund.
1989	Vesta sets up Miljøinvest and Grønt Norge, first two Norwegian environmental BIC-funds
1991	Opplysningsvesenets fond adopts ethical guidelines.
1992	GES-Investment Services (then CaringCompany) introduces environmental (and subsequently ethical) screening for Scandinavian investors.
1993	Banco launches ethical charity funds.
1995	Robur establishes an ethical council
1995	Storebrand sets up an SRI Department
1997	PKA[12], as first Danish investor, mainstreams SRI.
1998	Alm Invest launches the first Danish environmental fund.
1999	Storebrand's environmental fund adopts principles on human rights developed in cooperation with Human Rights Watch and Amnesty, and established the Red Cross fund.
1999	Sparinvest sets up first Danish non-environmental ethical fund.
1999	Swedish KPA launches four ethical funds.
2001	Banco sets up an ethical council in Norway.
2001	Swedish Robur introduces screening on human and labour rights abuse.
2001	Storebrand mainstreams SRI across all equity investments.
2001	Swedish national pension funds, Ap-fonderna, were legally bound to take ethical issues into account in their asset management.
2001	Environmental fund Norway, a public pension fund, is established.
2002	KLP first Norwegian pensions provider mainstreams SRI, as do first Swedish pensions providers Folksam and KPA.
2002	First disclosed Scandinavian divestiture by GPF.
2002	Church of Sweden reforms ethical guidelines to include conventions on specific weapons.
2003	Church of Norway reforms ethical guidelines to include conventions on specific weapons.
2004	GPF reforms ethical guidelines, emphasizes engagement and sets up the Ethical Council.
2004	Danish ATP-act in effect, emphasizing ethical considerations in asset management.
2004	Swedish Robur and Banco introduces negative criteria on pornography.
2006	GES Investment Services launches SIX/GES Ethical Index.
2006	PRI[13] is co-developed by GPF, and endorsed across Scandinavia

Source: Bengtsson, 2008

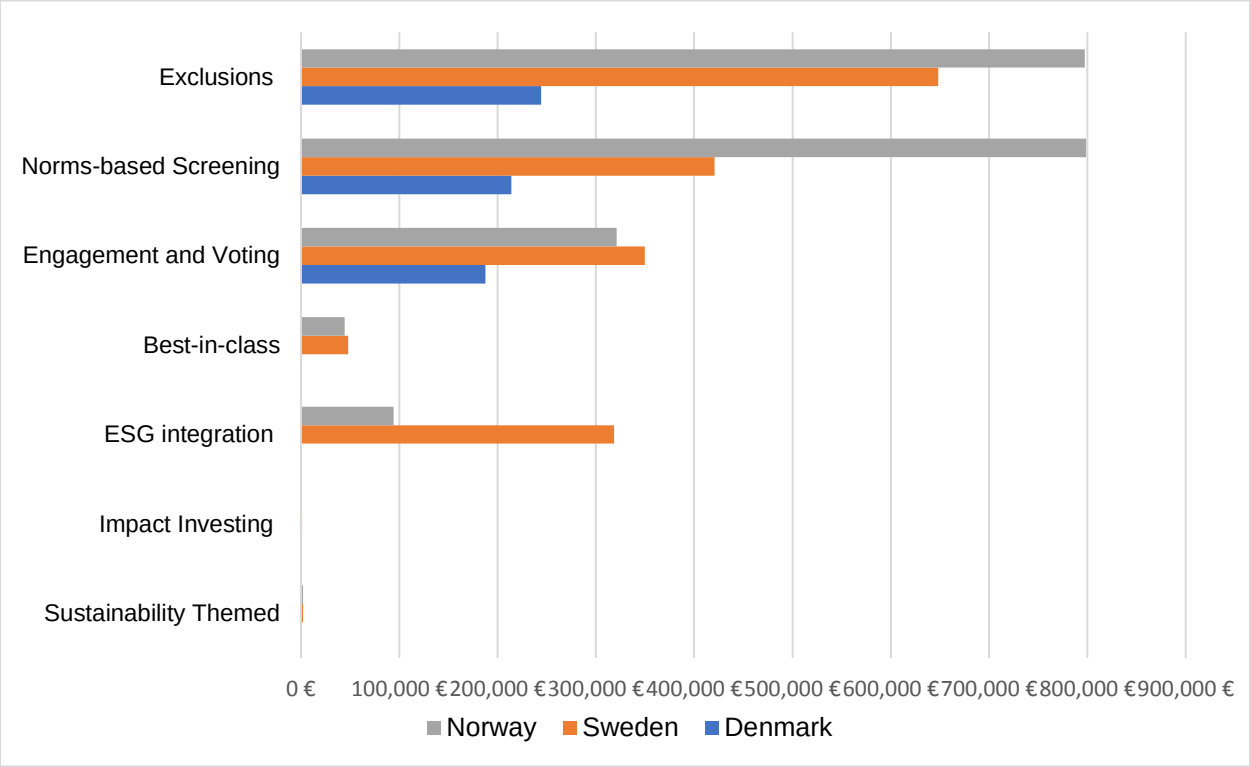
12 PKA: Pensionskassernes Administration
13 PRI: Principles for Responsible Investing

Table 2: Definitions of SRI strategies

SRI Strategy	Definition
Negative/ Exclusionary screening	This investment approach excludes industries such as tobacco, alcohol, gambling, weapons or pornography form being involved in a fund's investments choices.
Positive/ Best-in-class screening	This strategy uses ESG analyses to choose among the leading or most improving companies within their industries for investing.
Norms-based screening	This SRI strategy evaluates companies based on minimum standards as defined by international organizations such as OECD, UN and UNICEF.
ESG integration	This approach involves the formal integrating of ESG factors in financial statements.
Sustainability themed investing	This approach focuses on specific sustainable innovations such as renewable energy, energy efficiency or environment-friendly technologies.
Impact/community investing	This includes investments aiming at solving certain social or environmental issues.
Corporate engagement and shareholder action	This investment action employs shareholder power. By doing so investors can affect companies' decisions following ESG guidelines.

Source: GSIA Global Sustainable Investment Review, 2016; Eurosif, European SRI study, 2016

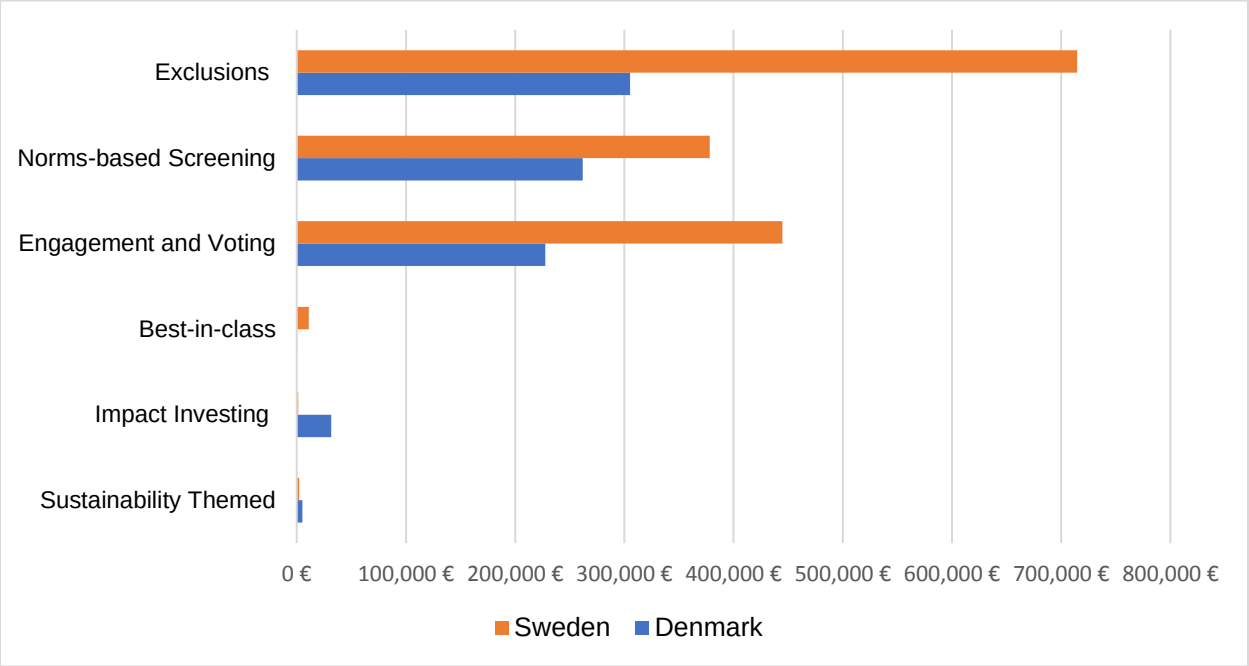
Figure 1 - SRI strategies in Norway, Sweden and Denmark in 2013 in million Euros [14]



Source: Eurosif, European SRI study, 2014; Eurosif, European SRI study, 2016

[14] For all the Scandinavian countries, the exchange rates as of 31/12/2013 are used. The conversions are performed from Eurosif.

Figure 2 - SRI strategies in Sweden and Denmark in 2015 in million Euros [15] [16]



Source: Eurosif, European SRI study, 2016

[15] Norway is not part of the European SRI study 2016 and thus the information for this country could not be obtained.
[16] ESG integration numbers are not provided at the European SRI study 2016.