GRA 19502

Master Thesis

Evaluating the Performance of Norwegian Socially Responsible Investment Funds

Navn: Camilla Øglænd Nordvold, Silje Simonsen Viste

Start: 02.03.2018 09.00

Finish: 03.09.2018 12.00

Silje Simonsen Viste
Camilla Øglænd Nordvold

- Evaluating the Performance of Norwegian Socially Responsible Investment Funds -

Date of submission:
25.06.2018

Supervisor:
Siv Jønland Staubo

Campus:
BI Norwegian Business School, Oslo

Examination code and name:
GRA 19502 Master thesis

Programme:
Master of Science in Business, Major in Finance

Abstract

This study investigates the financial performance of Norwegian SRI mutual funds over the time period January 2010 - December 2017. The study is performed by comparing 32 SRI funds to 42 conventional funds with similar characteristics, as well as an index benchmark. Both a matching pair analysis of 11 SRI funds and 11 conventional funds and an analysis of the full fund sample at aggregated level, are performed. The findings show a pattern of SRI funds outperforming conventional funds. However, small performance gaps and few statistically significant results lead to the conclusion that there are no significant differences between the performance of SRI funds and conventional funds. The study further extends previous research by evaluating fund performance over two sub-periods: (I) 2010-2013 and (II) 2014-2017, finding no significant differences in performance of SRI funds over the two periods.

Acknowledgement

We would like to express our appreciation to our supervisor, Associate Professor Siv Jønland Staubo at BI Norwegian Business School. She provided us with great guidance, useful inputs and valuable discussions throughout the process of writing this thesis.

CONTENT

List of tables

1 INTRODUCTION

Recent years have witnessed an increasing trend among investors in not just aiming for strong financial performance, but also believing that their investments should be used to contribute to societal and environmental needs. The motivation behind socially responsible investment (SRI) reaches from investor´s personal values and goals, to managing risk and seeking long-term financial outperformance (US-SIF, 2017). Along with an increasing interest in the field of SRI, a number of questions have been raised among investors and researches worldwide. It all comes down to one big question of interest: Does socially responsible practices come at the cost of financial return?

Previous researches in the field have found contradictory results regarding financial performance of SRI funds. Most studies have compared historical returns of SRI funds to conventional funds and a market index. Research by Hamilton, Jo and Statman (1993), Goldreyer and Diltz (1999) and Kreander et al. (2005) found no significant difference between the financial performance of SRI funds and conventional funds. However, Mallin, Saadouni and Briston (1995) and Statman (2000) found evidence that SRI funds had weak superior performance to conventional funds. At the contrary, Baurer, Derwall and Otten (2007) found evidence of SRI funds underperforming conventional funds. Although research in the field reaches different conclusions, most previous studies have not found any significant differences in the financial performance of SRI funds and conventional funds.

There are two aims of this study. Most previous research in the field of SRI has been focusing on foreign asset markets, mainly the US, UK, Asia and some parts of Europe. There is little research on the Norwegian SRI market, and as far as the researchers have been able to uncover, none that exclusively focuses on funds with a global investment universe. Therefore, the first aim is to compare the financial performance of Norwegian SRI mutual funds that invests globally to conventional funds with the same investment universe. Secondly, the rapid increase in interest towards SRI motivated us to study whether there has been a development in the performance of such funds over the period of our study. The main research period of eight years, drawing from January 2010 to December

2017, is therefore divided into two sub-periods: (I) from 2010 – 2013, and (II) from 2014 – 2017.

To analyze the financial performance of SRI funds, we have in this study divided the main analysis into two parts. The first part is a matching-pair analysis, where 11 SRI funds are paired with 11 conventional funds based on four characteristics; age, size, portfolio weights and index benchmark. This is in line with recommendations from previous research, and enables us to compare SRI funds directly to conventional peers, assuming that the difference in return is a result of ethical screening (Mallin et al., 1995; Kreander et al., 2005). The second part of our analysis studies the funds at aggregated level, comparing the financial performance of an SRI portfolio to a conventional portfolio. The portfolios are constructed as weighted average monthly returns of the full fund sample of 32 SRI funds and 42 conventional funds. To examine the time-period aspect, both analyses are run over the full sample period of eight years as well as the two sub-periods (I) and (II).

The results from this study show evidence of SRI funds outperforming conventional funds on average. However, the differences are small and few of the results are statistically significant. This leads us to conclude that we do not have empirical evidence suggesting that there are any differences in the financial performance of SRI funds and conventional funds. The impact of these findings is an indication that investors can, without sacrificing financial return, align their investments with ethical, societal and environmental concerns. Further to that, we find no significant differences in the financial performance of SRI funds over the two sub-periods.

The rest of this paper is organized as follows: Section 2 gives a brief overview of the concept of SRI, different screening strategies and the industry background. Section 3 presents previous research. Section 4 presents the theoretical background of this study, as well as the hypotheses to be tested. The methodology is presented in section 5, whilst section 6 outlines the chosen dataset and sources of data. In section 7 the results are presented and discussed, before concluded in section 8.

2 SOCIALLY RESPONSIBLE INVESTING

The past decades investors have become increasingly aware of the importance of their investments being aligned with their values. Following the rapid development of and interest in SRI, there are many ways of interpreting the term. In this study, SRI will be defined in accordance with the definition of US-SIF (2017): "Socially responsible investing is an investment discipline that considers environmental, social and corporate governance (ESG) criteria to generate long-term competitive financial returns and positive social impact". Another term that is commonly mentioned in relation to SRI is Corporate Social Responsibility (CSR). CSR can be defined as "the responsibility of enterprises for their impacts on society", and is a term that has become a part of the daily language of corporations worldwide (European Commission, 2011).

The general term of SRI is, according to Eurosif (2016), divided into concepts such as exclusion, impact investing, sustainability-themed investments, norm-based screening and ESG quant. To enable a better understanding of this study, we will in this chapter provide a brief overview of the most common investment strategies related to SRI, as well as the industry background.

2.1 SRI Screening

There are multiple different investment strategies and approaches of SRI, that differs based on investment managers ethical and strategic focus. According to Eurosif (2016) one can divide these approaches into seven overall categories, which captures the most common strategies used in European countries:

Table 1: SRI screening strategies

STRATEGY	DEFINITION
Negative/exclusionary screening	Excluded companies based on specific underlying ESG-criteria. The most common industries are related to alcohol, tobacco and weapons
Positive/best in class screening	Investment in sectors, companies or projects selected for positive ESG performance relative to industry peers
Norms-based screening	Screening of investments against minomum tandards of business practice based on international norms
ESG integration	The systematic and explicit inclusion by investment managers of ESG factors into financial analysis
Sustainability themed investing	Investment in themes or assets specifically related to sustainability (e.g. clean energy, green technology etc.)
Impact/community investing	Target investment aimed at solving social or environmental problems, and including community investing where capital is specifically directed to traditionally underserved individuals or communities
Engagement	The use of shareholder power to influence corporate behavior through direct corporate engagement etc.

There is no dominant screening strategy, however there are different trends among investment managers and their preferences. Negative screening is looked upon as the "simplest" approach, while positive screening is known to be the more proactive strategy. It is more proactive as, in addition to excluding certain companies/industries, investors take action in supporting the companies that have profound ESG-standards. However, this strategy is more costly and harder to perform. The "best-in-class" strategy goes beyond positive screening by making sure that the portfolio is spread across industries (Kempf & Osthoff, 2007, p. 909).

2.2 The Market
Worldwide

SRI has grown substantially over the last years - in all styles, worldwide, and at a rate that outperforms most other investment styles. As of 2016, there was an increase of 25% assets being managed professionally under responsible investment strategies compared to 2014. This increase left the number of assets at $22.89 trillion, meaning that SRI stands for 26% of the total global asset market. The most common SRI strategy worldwide is negative/exclusionary screening, followed by ESG integration (GSIA, 2016). Europe dominates worldwide in terms of portion of SRI assets, as it stands for 52.6% of the market. Studies show that negative screening is the most commonly used screening method in Europe, covering 48% of the total European managed assets (Eurosif, 2016).

Norway

Norway is known to be in the lead of SRI, with a great part of its total amount of capital already heavily invested in ethical investments (Eurosif, 2012). In 1990, as a result of large state revenues from the petroleum industry, the Norwegian Government Pension Fund Global (GPFG) was established. The Fund's essential mission was to work as a fiscal policy tool to underpin long-term considerations of petroleum revenues to the Norwegian economy, with an ambitious ethical commitment. Over the years, thorough management of the Fund has made sure that current and future generations may draw benefits from the wealth that petroleum brings to Norway (Government, 2017).

The most commonly used SRI strategies in Norway are exclusion and norms-based screening, where the focus lies on excluding companies that are associated with tobacco, weapons and environmental issues (GSIA, 2016). When it comes to the Norwegian Government Oil Fund, it follows a strategy that is a combination of negative screening and engagement (Dimson et al., 2013). There is no set legal framework regarding SRI practices in Norway, however they rely profoundly on the foundation of the oil fund. The fund sets high ethical standards both in Norway and the international market, due to its size and great influence (Responsible Business, 2013).

3 BACKGROUND AND LITERATURE REVIEW

This section presents previous research on the field of SRI, mainly focusing on the financial performance of SRI funds relative to conventional funds.

Hamilton et al. (1993) studied the performance of 32 American SRI mutual funds, with data provided by Lipper Analytical Services, from the period 1981 to 1990. Using Jensen´s alpha they measured the excess returns of each SRI fund, and compared the results to a random sample of 320 conventional funds during the same period. The results of the study indicated that socially responsible factors had no effect on expected stock returns or companies cost of capital, and that SRI funds did not significantly outperform conventional funds.

Mallin et al. (1995) conducted a study on the UK market, comparing the financial performance of 29 SRI and 29 conventional funds through a matching pair analysis over the period of 1986-1993. They matched the funds based on characteristics such as investment universe, age and size, aiming at capturing some of the effects possibly affecting performance, which the standard 1-factor model has been criticized for not capturing. They found that on risk-adjusted basis SRI funds outperformed regular funds on average. This weak superior performance of SRI funds could, according to the researchers, be explained by an increased awareness and interest in ethical investment, which in turn lead to increased demand.

Goldreyer and Diltz (1999) examined a sample of 49 SRI funds, and compared the performance of these funds to a random sample of conventional mutual funds.

Using Jensen´s alpha to measure performance, the results of the study indicated that SRI/screening did not systematically affect fund performance. The results further showed that SRI funds that employed positive screening/inclusion outperformed those that did not.

Statman (2000) evaluated the performance of 31 all equity SRI funds against 63 conventional funds in his study of the American SRI market from 1990 – 1998. He used both index benchmarks and a matching pair analysis to evaluate the performance of the funds. The results from the study indicated that SRI funds performed better than conventional funds of equal asset size, but the difference was not statistically significant.

Bauer, Koedijk and Otten (2005) used an international database of 103 German, UK and US SRI funds from the period 1990 – 2001 to review and extend previous research on the performance of SRI funds. In order to overcome the benchmark problems that many previous studies had experienced before, they applied a matching pair analysis and Carhart´s multi-factor model. The 103 SRI funds were compared to the performance of 4384 conventional funds during the same period. The study provided three interesting findings: First, they found no evidence of significant differences in risk-adjusted returns between SRI funds and conventional funds. Second, SRI funds underwent an initial phase of "catching up" relative to the mutual funds, before eventually delivering similar financial returns. Finally, SRI funds showed clear evidence of a different investment style compared to conventional funds. For example, the ethical funds tended to be more growth-oriented, and less value-oriented.

Similar to previous studies, Kreander et al. (2005) analyzed the performance of 30 SRI funds and 30 conventional funds from the UK, Netherlands, Germany and Sweden through a matched pair analysis. Studying the period of 1995-2001 they found that both ethical and conventional funds generally underperformed the market, and that there were no statistically significant differences in performance between ethical and conventional funds.

Bauer, Derwall and Otten (2007) studied the aggregate performance and investment style of SRI and conventional funds, in order to examine the

performance and risk sensitivities of ethical funds in Canada. Initially the researchers employed Jensen´s alpha and hence the CAPM-based single factor model to examine the funds performance. They further pointed to that the 1-factor asset-pricing model was arguably insufficiently able to explain the cross-section of expected stock returns, and therefore additionally employed Carhart´s 4-factor model to evaluate performance. The results of the study indicated that ethical funds underperformed conventional funds, but the results were not statistically significant.

Cortez, Silva and Areal (2009) investigated the performance of a comprehensive sample of 88 SRI funds from seven European countries: UK, Austria, Belgium, France, Germany, Italy and the Netherlands. Specifically, they collected monthly data from August 1996 to February 2007, and measured performance based on Jensen´s alpha. The results from the study showed that European SRI funds presented a comparable performance to that of conventional funds and socially responsible benchmarks. Hence, the results indicated that investors could choose European SRI funds without necessarily sacrificing financial performance.

Gil-Bazo, Ruiz-Verdù and Santos (2010) applied the matching estimator methodology to study and compare the performance of 86 US SRI mutual funds to 1761 conventional mutual funds in the period 1997-2005. The results from the study indicated that the SRI funds managed by companies that specialized in SRI performed better than conventional funds with similar characteristics. On the contrary, SRI funds run by companies that did not specialize in SRI underperformed their matching conventional funds. These findings suggest that investors should take into account management company characteristics, particularly with respect to specialization in SRI, when investing in SRI funds. The results were not statistically significant. The researchers employed Carhart´s 4-factor model to estimate risk-adjusted performance.

El Ghoul and Karoui (2017) used an asset-weighted composite CSR fund score to study the effects of CSR on fund performance. With a final sample of 2 168 US equity domestic funds from the period of 2003-2011, they constructed a yearly CSR score at the fund level equal to the sum of weights and CSR score of each individual stock included in the fund. Further, they employed Carhart´s 4-factor

model to estimate the risk-adjusted performance of each fund. The results from the study indicate that funds with a high CSR score exhibit relatively poor, but persistent performance, and therefore may struggle to attract performance-chasing investors. At the contrary, a low CSR score exhibit higher, but less persistent performance. The researchers conclude that high SCR scores attract social investors that are less sensitive to performance.

4 THEORETICAL FOUNDATION AND HYPETHESES

This section presents the theoretical foundation of this thesis, as well as the hypotheses to be tested.

The main theories often used in the discussion of SRI fund performance are the ones undertaking the relationship between a firm´s engagement in CSR and its financial performance. Variations of arguments have been made throughout the years regarding this relationship, however there are two dominate schools of thought: the extremes of a positive- and negative relationship (McGuire, Sundgren, & Scheneeweis, 1988).

4.1 Negative relationship: The cost-concerned school

The negative relationship between CSR and financial performance is explained by the central argument of potential trade-off arising between the two (McGuire, Sundgren, & Scheneeweis, 1988). This trade-off refers to costs that a firm incurs from CSR actions, such as collecting, bringing together and analyzing information. According to this theory, firms that wish to engage in socially responsible investing will incur higher costs, which will have negative effects on their overall financial performance, and put them at an economic disadvantage compared to others (Jaggi & Freedman, 1992; Ullmann, 1985).

There are multiple economists over the years that have supported the theory of a negative relationship, one of the most famous being Milton Friedman. Friedman was a well-known American economist, and an important advocate for the cost-concerned school. In his book "Capitalism and Freedom" (1962), Friedman stated that the only social responsibility a business has is to its shareholders, and that any

other engagement of CSR will negatively affect its financial performance. He argued that if socially responsible actions would have a positive effect on financial performance, it would already be incorporated in the business model.

4.2 Positive relationship: The value creation school

The negative relationship presented above has more recently been questioned. On the other side of the argument, we have those who argue that there is a positive relationship between CSR and financial performance. Naturally, those who incorporate CSR into their strategic decisions believe that it will benefit the firm and outweigh any potential incurred costs. A common argument is that addressing CSR can trigger innovations that lower total costs and improves the value of the company, and thus improve financial performance (Ullmann, 1985).

Sing & Pachar (2012, p. 38) supports the argument of a positive relationship by stating that a firm´s products and services will be more attractive to customers if the firm is involved in CSR activities. Although the researchers recognize the costs associated with CSR activities, they state that the potential long-term benefits will outweigh these costs. They respond to the commentators by arguing that any decrease in financial performance must be due to wrongful investing in CSR that goes against company values or line of business.

One of the most influential economists supporting the value creation school is Michael Porter, who together with Mark Kramer (2006) emphasized that: "Any business that pursues its ends at the expense of the society in which it operates, will find its success to be illusory and ultimately temporary". Porter and Kramer (2011) further supported this argument, arguing that by recognizing societal needs, a firm is able to expand the total pool of economic and social value.

4.3 Hypotheses

Based on the empirical research and theoretical discussion presented above, this thesis aims at examining whether there are any differences in the financial performance of SRI funds and conventional funds in the Norwegian market. The following hypothesis will therefore be studied:

Hypothesis 1:

H_0: *Financial performance does not differ between SRI funds and conventional funds.*

H_A: *Financial performance differs between SRI funds and conventional funds.*

This study further aim at answering whether the financial performance of SRI funds relative to conventional funds have changed over the last eight years. We therefor extend our research by examining the first hypothesis over two sub-periods: 2010-2013 (sub-period (I)) and 2014-2017 (sub-period (II)), to study hypothesis 2:

Hypothesis 2:

H_0: *The financial performance of SRI funds relative to conventional funds does not differ over the two sub-periods (I) and (II).*

H_A: *The financial performance of SRI funds relative to conventional funds strengthens/weakens over the two sub-periods (I) and (II).*

5 METHODOLOGY

In this section we describe the methodology used throughout the thesis. The first section presents the model specifications, before the analytical approach will be explained in the following section. The analysis is divided into three steps: (1) the matching-pair analysis, (2) the portfolio-level analysis and (3) analyzing traditional performance measures. All tests and models used to analyze the data in this study are executed in SPSS and excel.

5.1 Model specifications

5.1.1 The Capital Asset Pricing Model and Jensen´s alpha

For the matching pair analysis, a 1-factor regression model based on the traditional Capital Asset Pricing Model will be applied. CAPM is a fundamental financial model, describing the relationship between systematic risk and expected returns for assets:

$$R_i - R_f = \alpha_i + \beta_i(R_m - R_f) + \varepsilon_i$$

Where R_i is the return on asset i, R_f is the risk free rate, $(R_m - R_f)$ is the market risk premium, β_i is the systematic risk of asset i and α_i is the performance measure.

Jensen´s alpha (α_i in the CAPM) is one of the most commonly used measures of fund performance, developed by Jensen (1968). This technique has been applied in several of the studies mentioned in chapter 3. Jensen's alpha is a risk-adjusted performance measure, which represents the deviation between the actual portfolio return and the estimated portfolio return predicted by the CAPM:

$$\alpha_i = R_i - \left[R_f + \beta_i \left(R_m - R_f \right) \right]$$

If the intercept alpha is significantly positive (negative), this is an indication that the fund performs better (poorer) than the market.

5.1.2 Carhart´s 4-factor model

Jensen's (1968) simple extension of the CAPM model was later extended into different multifactor models. These extensions made it possible to capture a broad specter of anomalies observed in the market that could foresee deviations from the expected returns consistent with the CAPM. Fama and French (1993) expanded the 1-factor model by adding two additional variables; high minus low (HML) and small minus big (SMB). These two factors were added to account for the book-to-market and size anomalies, which are observed to be good predictors of return, but are inconsistent with the return levels of CAPM. Based on Fama and French's 3-factor model, Carhart (1997) added an additional factor, MOM. This additional factor captures the momentum anomalies that good and bad performances of stocks tend to be persistent over time.

As Carhart´s 4-factor model arguably has improved explanatory power compared to both the 1- and 3-factor models, it will be used in this study to analyze the full fund sample at portfolio level:

$$r_{i,t} - r_{f,t} = \alpha_i + \beta_{i,MKT}\left(r_m - r_f \right) + \beta_{i,HML} HML_t + \beta_{i,SMB} SMB_t + \beta_{i,MOM} MOM_t + \epsilon_{i,t}$$

The first part of the model is the same as for the 1-factor model, and the alpha-interpretation is still a predictor of fund performance. $\beta_{i,HML}$, $\beta_{i,SMB}$ and $\beta_{i,MOM}$ are the estimated factor exposures to the three factors HML, SMB and MOM.

5.1.3 Traditional performance measures

The CAPM presents a framework for evaluating the risk-adjusted performance of a portfolio/asset. As this model only measures performance in relation to systematic risk, other models of performance measure have been developed that also capture non-systematic risk. Jensen´s alpha is one of those measures (as described above). In addition to Jensen´s alpha we will in this study use other traditional performance measures at fund-level, in an attempt of reaching more robust results. The additional performance measures will be described briefly in the following.

Sharpe Ratio

William Sharpe introduced the Sharpe Ratio in 1966, which is one of the most commonly used measures of risk-adjusted performance. Sharpe ratio is calculated by taking the excess return of the portfolio divided by its standard deviation:

$$Sharpe\ Ratio = \frac{R_p - R_f}{\sigma_p}$$

Information Ratio

The information ratio takes the difference between the return of the portfolio and its benchmark, divided by the standard deviation of those results. It measures how well a portfolio manager is able to generate excess return relative to the benchmark:

$$IR_p = \frac{R_p - R_b}{\sigma(R_p - R_b)}$$

Modified Sharpe Ratio and Modified Information Ratio

Whenever portfolio returns are sufficiently low for both the Sharpe and Information ratio, the numerator becomes negative, and the ratios break down. In order to correct this weakness, the denominator is adjusted by raising the standard

deviation to the power of excess return divided by the absolute value of the excess return:

$$Modified\ Sharpe\ Ratio = \frac{R_p - R_f}{\sigma_p^{\frac{R_p - R_f}{ABS(R_p - R_f)}}}$$

$$Modified\ Information\ Ratio = \frac{R_p - R_b}{\sigma(e_p)^{\frac{R_p - R_b}{ABS(R_p - R_b)}}}$$

The changes to these ratios do not have an impact if the excess returns of the portfolios are positive, as the exponent becomes one divided by one.

Treynor Ratio

The Treynor ratio is similar to the Sharpe ratio, however instead of using standard deviation to measure volatility, it is based on systematic risk (the beta of the portfolio). It measures the excess return over those that might have been gained on a risk-less investment, per unit of market risk:

$$Treynor\ Ratio = \frac{R_p - R_f}{\beta_p}$$

Modigliani and Modigliani's M^2

M^2 measures the return of the portfolios for the amount of risk taken relative to the benchmark portfolio. It reflects how much an investor is rewarded for taking on a certain amount of risk, relative to its benchmark and the risk-free rate.

$$M_p^2 = \frac{R_p - R_f}{\sigma_p} \times \sigma_m - (R_m - R_f)$$

5.2 Analytical approach

5.2.1 Matching pair analysis

Previous research indicates that an effective way of studying the performance of SRI funds compared to conventional funds is by conducting a "matching-pair" analysis. Mallin et al. (1995) were among the first to study performance of SRI funds this way, by matching ethical funds to conventional based on size and age.

Gregory, Matakto and Luther (1997) extended this model by also including portfolio weighting as a matching factor, while Kreaned et al. (2005) also included investment universe. As all the funds in this study invest globally, the three other factors (size, age and portfolio weighting) are used to match the funds. Additionally, index benchmark is used as a fourth factor to strengthen the comparability.

In this part of the analysis, two tests will be conducted; a paired samples t-test and a 1-factor regression model (Jensen's Alpha). These tests will be explained explicitly in the following. In addition to running the tests on each matched pair, equally weighted portfolios will be constructed for each group. Thus, one ethical and one conventional portfolio are constructed as the equally weighted monthly average return of the SRI funds and conventional funds, respectively. All tests will be run for the full research period of 8 years and the two sub-periods.

Paired samples t-test

T-tests are in general used to assess whether the means of two groups are statistically different from each other. By matching SRI funds with conventional peers based on matching-criteria such as size, age etc., one could, seen apart from the fact that one invests based on ethical guidelines and the other do not, possibly assume that the fund´s returns should be rather similar. It is therefore appropriate to conduct paired samples t-tests on each pair and the portfolios to investigate if there are statically significant differences between the performance of SRI funds and their conventional peers. If the results show no significant differences, this indicates that SRI funds do not perform any better/worse than conventional funds with similar characteristics.

1-factor model; Jensen´s Alpha

As described in the previous section, the 1-factor model will be used to study the matched pairs. First and foremost, the regression will be run on each of the 22 matched funds. Each fund´s risk premium represents the dependent variable, while the market´s risk premium is the explanatory variable. The results from the regression will be compared between the SRI funds and their conventional peers.

Jensen´s alpha will further be calculated at an aggregated level, where the SRI funds represent the ethical portfolio that will be compared to the conventional portfolio. This is in line with the research by Bauer et al. (2005), and allows one to compare one single alpha-value of the ethical portfolio to the alpha value of the conventional. Bauer et al. (2007) extended this model by including a difference portfolio, explicitly assuming that the difference in risk-adjusted return of ethical and conventional funds is a result of ethical screening. The portfolio is constructed by subtracting the return of the conventional portfolio from the return of the ethical. This difference portfolio will represent the dependent variable, while the market risk premium is the explanatory variable in the regression. If the alpha is positive (negative), the ethical funds outperform (underperform) the conventional funds.

Although the 1-factor model is widely used in fund performance research, it has been criticized for its inability to explain the cross-section of expected returns. By using a matched pair analysis this study aims at controlling for some of the factors that the 1-factor model has been criticized for not capturing. More pervious research seems to prefer multi-factor models to single-factor models, thus the next section presents the second part of the analysis: Carhart´s 4-factor model.

5.2.2 Portfolio level analysis

In this par of the analysis, Carhart´s 4-factor regression model will used to compare the performance of an ethical and conventional portfolio. The ethical and conventional portfolio refers the weighted average monthly return of all funds for that respective category. Similar to the matched pair analysis, the regressions will be run for the full sample period of eight years, and sub-period (I) and (II). The difference is that this model includes the full sample of funds, also those who have launched and/or closed during the time period of eight years. The portfolios excess return will be the dependent variable, while market premium, SMB, HML and MOM are the independent variables. The results obtained from the regressions will be compared between the ethical and conventional portfolio in all three periods.

Similar as for the 1-factor model, there will be constructed a difference portfolio for the 4-factor model, referring to the difference between the full-sample ethical

and conventional portfolio. The difference portfolio returns represent the independent variable, while market risk premium, SMB, HML and MOM are the explanatory variables in the regression.

5.2.3 Robustness tests

As a final check, the validity and robustness of the regression results will be investigated. Adjusted R^2 values will be studied for each regression to analyze the models explanatory power. In this study, values below 0.7 will be pointed out. Additionally, several diagnostic tests will be performed on the regression residuals. To test for autocorrelation Durbin-Watson values will be observed, where values between 1.5 and 2.5 are assumed to indicate no autocorrelation. Breusch-Pagan and Koenker tests will be used to control for heteroscedasticity. To further control for normality, the results from Shapiro-Wilk tests will be studied. Lastly, VIF-tests will be performed to control for multicollinearity between the explanatory variables in the 4-factor model.

6 DATA

6.1 Data sources

The period of analysis goes over 8 years, studying actively managed Norwegian mutual funds from January 2010 to December 2017. Further aiming at investigating *Hypothesis 2*, this period is divided into two: year 2010-2013 and 2014-2017 representing sub-period (I) and (II), respectively. The collected data material used with the purpose of answering both research questions is the monthly return data of the funds, relevant index benchmarks, risk free rate, the factors of Carhart´s 4-factor model as well as the four matching criteria.

The historical monthly net asset value (NAV) of the final fund sample is extracted from Thomson Reuters Datastream. The NAV values, which are given in NOK, are used to calculate the monthly return of the funds. Similar to Jensen (1968) and Gregory et al. (1997) (referred to by Kreander et al., 2005), we will in this study use logarithmic returns, calculated by the following equation:

$$r_{jt} = \ln\left(\frac{P_{jt}}{P_{jt-1}}\right)$$

Where r_{jt} is the return of fund j in period t, P_{jt} is the price of fund j in period t and P_{jt-1} is the price of fund j in the last period.

In the first part of the analysis, selected SRI funds are matched with conventional funds based on four "matching-criteria": age, size, portfolio weighting and index benchmark. These factors are identified mainly through Morningstar Inc. and Thomson Reuters Datastream. Monthly data on the four factors in Carhart´s model are extracted from the data library available at Kenneth R. French's homepage. To make it comparable to the studied funds, the global data under "Developed market factors and returns" is used[1]. The global factors include data from 23 countries in four different regions[2].

6.2 Data filtering

This study concentrates on the Norwegian mutual fund market, limited to funds with a global investment universe. The funds were selected based on the following criteria:

Table 2: Fund selection criteria

Criteria	SRI funds	Conventional funds
Open ended	x	x
Min. 75% equity holdings	x	x
Non-specific	x	x
Actively managed	x	x
Investment universe: Global	x	x
SRI screening	x	
Registered in Norway	x	x
Fund data within 2010-2017	x	x

Only funds registered in Norway with global investment universe are included. This is due to the fact that Norwegian companies generally perform very well on SRI screenings. If funds mainly investing in Norwegian companies were to be included, there would possibly be an insignificant change in holdings of SRI funds as compared to conventional funds.

---

[1]http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html#Developed

[2] http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/details_global.html

Only funds that are open ended, hence open to all investors for investment, are included. Since the performance of equity funds is investigated, a minimum of 75% equity holdings is required, in line with Morningstar´s definition of an equity fund. Only actively managed funds are included, and all funds must be non-specific in order for them to be comparable to an appropriate market index. To avoid possible survivorship biases, funds launched and/or closed during the eight-year research period are included in the full sample.

The initial list of SRI funds was extracted from Thomson Reuter´s list of ethical funds matching the above criteria. This list was shortened considerably after control checking the extent of SRI screening and ESG scores for the funds. Both Morningstar´s sustainability and ESG ratings and each fund´s own reports were thoroughly investigated in order to determine which funds could be categorized as "SRI funds" in this study. The reason why additional research felt necessary in this area is the importance of the funds included in the SRI category actually being "ethical" to the fullest extent. Morningstar has a reputation of being the strictest in the market regarding SRI scores.

6.3 Index benchmarks

For the 1-factor model in the matching pair analysis the ethical and conventional funds of each "pair" will be analyzed both separately and as two equally weighted portfolios (one ethical and one conventional). Each fund will be compared to it´s respective index benchmark. As the fund´s index benchmarks are one of the matching criteria, each fund in the same "pair" will be compared to the same index. More specifically, each pair´s index benchmark will be a choice of the best match for either the respective index chosen by the funds in that pair or the one specified by an independent provider of investment analyzes, in this case Morningstar. Information about the fund´s index benchmarks is gathered from Morningstar[3]. Monthly return data (given in USD) for each of the chosen indices has been made available from Oslo Stock Exchange´s (OBSX) database. All data given in USD will be calculated into NOK using Norges Bank´s daily historical USD/NOK exchange rates[4]. To analyze the funds on portfolio level, an index of weighted monthly average returns of the selected indices will be constructed.

---

[3] http://www.morningstar.no/no/fundquickrank/default.aspx
[4] https://www.norges-bank.no/Statistikk/Valutakurser/valuta/USD

For the 4-factor model, an index benchmark is included as the value-weighted estimate of the market, together with the three other factors (SMB, HML, MOM). As monthly data for the other three factors are gathered from Kenneth R. French's homepage, a natural choice was to apply the index included in the same dataset. As we are studying Norwegian funds investing globally, we assessed global data on the four factors as a better fit compared to Norwegian data. On this basis the chosen index benchmark for the 4-factor model is the one available together with the other three factors for the global market.

6.4 Risk free rate

As an estimate for the risk free rate of return in the 1-factor model the Norwegian 3-month Treasury bill obtained from Norges Bank will be used[5]. For the 4-factor model the US 1-month T-bill will be used as a proxy for the risk free rate, obtained from the same global dataset at Kenneth R. French´s homepage

7 RESULTS

To analyze whether *Hypothesis 1* holds, we here report the results from the three different models: 1) the matching pair analysis using Jensen´s alpha 1-factor model, 2) the full sample portfolio analysis using Carhart´s 4-factor model, and 3) the traditional performance measures. Further analyzing *Hypothesis 2,* all results are specified over 1) the main sample period from January 2010 to December 2017, 2) sub-period (I) from 2010-2013 and 3) sub-period (II) from 2014-2017.

7.1 Matching pair analysis

In this section the results from the matching pair analysis will be presented and discussed, by going through the results from the paired t-tests and the 1-factor model specified for the matched pairs.

7.1.1 Matched pairs obtained

Only funds that have available data for the entire sample period of 8 years have been included in this part of the analysis, due to the lack of information about certain matching-criteria for funds that no longer exist. An overview of the final

---

[5] https://www.norges-bank.no/Statistikk/Rentestatistikk/Statskasseveksler-Rente-Manedsgjennomsnitt-av-daglige-noteringer/

11 matched pairs with information about size, age, portfolio weights and other matching criteria can be found in Appendix 1. Dependent on the availability of monthly returns data, one of the two mentioned index benchmarks was chosen for each pair. The final pairs with chosen index benchmarks are presented in table 3.

Table 3: Matched pairs

Pair	Ethical/conventional	Fund name	Index Benchmark
1	Ethical	C World globale aksjer etisk	MSCI World Growth NR USD
	Conventional	C Worldwide globale aksjer	
2	Ethical	Delphi Global	MSCI World NR USD
	Conventional	Holberg Global A	
3	Ethical	DNB Aktiv 100	MSCI World NR USD
	Conventional	Pareto Global A	
4	Ethical	Alfred Berg Global Quant	MSCI World NR USD
	Conventional	Landkreditt Aksje Global	
5	Ethical	Fondsfinans Global Helse	MSCI World/Health Care NR USD
	Conventional	C Worldwide Medical	
6	Ethical	Eika Global	MSCI World NR USD
	Conventional	Danske Invest Investeringsprofil Aksjer	
7	Ethical	DNB Global (IV)	MSCI World NR USD
	Conventional	Skagen Global A NOK	
8	Ethical	Nordea Stabile Aksjer Global Etisk	50% MSCI World NR USD 50% MSCI World Value NR USD
	Conventional	Skagen Vekst A NOK	
9	Ethical	Pluss Utland Etisk	MSCI World NR USD
	Conventional	Vekterfond Aksje I	
10	Ethical	Storebrand Aksjespar	MSCI World NR USD
	Conventional	Fram Global	
11	Ethical	Storebrand Global Verdi	MSCI World Value NR USD
	Conventional	Danske Invest Horisont Aksje	

The table presents the final 11 matched pairs used in the first part of the analysis. Each pair represent one SRI fund and one conventional fund, matched on four factors; size, age, index benchmark and portfolio weighting. On the left side of the table, the funds in each pair are presented. The right side of the table presents the chosen index for each pair, used as a benchmark for the market.

For pair 8 all matching-factors were met besides reference index, and there was therefore created a weighted average index of 50% MSCI Value Index and 50% MSCI World index. All other funds in each pair had at least one matching index, which was chosen for that particular pair. To analyze the matched funds on portfolio level, a weighted average index was constructed. The number of pairs connected to each particular index determines the weight of that index. The final portfolio index will thus be a weighted average of: 68.2% in MSCI World NR USD, 9.1% in MSCI World/Health Care NR USD, 9.1% in MSCI World Growth NR USD and 13.6% in MSCI World Value NR USD.

7.1.2 Paired samples t-test

Paired samples t-tests were run on each pair and at aggregated level in order to investigate whether there was any statistically significant difference between the returns of ethical funds and their matching peers. Positive (negative) alpha values indicate that ethical funds outperform (underperform) their conventional peers. The results are examined at a 0.05 significance level.

Table 4: Paired samples t-test (fund level)

	Full sample period	Sub-period (I)	Sub-period (II)
Pair	Mean difference	Mean difference	Mean difference
1	-0,00045	-0,00074	-0,00015
2	0,00079	0,00325	-0,00167
3	-0,00072	-0,00262	0,00118
4	-0,00118	-0,00255 *	0,00018
5	0,00191	0,00035	0,00348
6	0,00094	0,00227	-0,00040
7	0,00203	0,00129	0,00277
8	0,00472	0,00509	0,00436
9	0,00106	0,00011	0,00201
10	0,00221	0,00439	0,00002
11	0,00264	0,00281	0,00248

*Where: * means significant at 10% level, ** significant at 5% level, *** significant at 1% level. The table presents the results from the paired samples t-test performed on each of the 11 matched pairs. From left to right the mean difference between the funds in each pair are presented for the full sample period, sub-period (I) and sub-period (II), respectively. Negative (positive) mean difference indicates an underperformance (outperformance) of the SRI fund relative to its conventional peer.*

The results from the paired t-test on fund level are presented in table 4. The findings indicate that, on average, SRI funds slightly outperform their matching peers in both the full sample period and the two sub-periods, with some exceptions. These observations are based on the results from all three periods showing mostly positive alpha values, although the findings are not statistically significant. Only one of the findings is statistically significant (at the 10% level), showing that the conventional fund in pair four outperforms the ethical fund in *sub-period (I).*

Table 5: Paired samples t-test (aggregated level)

	Mean difference
Full sample period	0,0012675 *
Sub-period (I)	0,0012401
Sub-period (II)	0,0012949

*Where: * means significant at 10% level, ** significant at 5% level, *** significant at 1% level. The table presents the results from the paired samples t-test performed on aggregated level for the full sample period and sub period (I) and (II). Negative (positive) mean difference indicates an underperformance (outperformance) of the SRI fund relative to its conventional peer.*

Table 5 present the results at aggregated level. All three periods show small positive alpha values, indicating that the ethical portfolio outperforms the conventional. The full research period shows a positive alpha at 10% significance level.

The results presented above indicate that SRI funds slightly outperform their conventional peers in all three periods, although none of the results are statistically significant at the 5% level. This leads us to conclude that we do not have empirical evidence suggesting that there are any differences in the financial performance of SRI funds and conventional funds.

7.1.3 Regression results: 1-factor model

Full sample analysis period: 2010-2017

The results from the 1-factor model at fund level over the full sample period are presented in table 6. The first fund in each pair is ethical.

Table 6: Results; 1-factor model (8 years) – fund level

Pair	Fund name	Alpha		Beta		Adjusted R^2
1	C WorldWide Globale Aksjer Etisk	-0,001		0,981	***	0,809
	C Worldwide Globale Aksjer	-0,001		0,983	***	0,806
2	Delphi Global	0,000		0,970	***	0,745
	Holberg Global A	-0,001		0,891	***	0,699
3	DNB Aktiv 100	-0,002		0,913	***	0,705
	Pareto Global A	-0,002		0,906	***	0,742
4	Alfred Berg Global Quant NOK	-0,003	**	0,963	***	0,882
	Landkreditt Aksje Global	-0,001	**	0,874	***	0,935
5	Fondsfinans Global Helse	0,001		0,782	***	0,791
	C WorldWide Medical	-0,001		1,041	***	0,833
6	Eika Global	-0,002		0,959	***	0,820
	Danske Invest Investeringsprofil Aksjer	-0,003	**	0,887	***	0,837
7	DNB Global (IV)	0,000		1,012	***	0,872
	SKAGEN Global A NOK	-0,002		0,951	***	0,720
8	Nordea Stabile Aksjer Global Etisk	0,001		0,803	***	0,726
	SKAGEN Vekst A NOK	-0,003		0,902	***	0,529
9	PLUSS Utland Etisk	-0,002		1,067	***	0,847
	Vekterfond Aksjer I	-0,004	***	0,885	***	0,837
10	Storebrand Aksjespar	-0,002		0,837	***	0,707
	FRAM Global	-0,005		0,810	***	0,439
11	Storebrand Global Verdi	0,003	**	0,978	***	0,816
	Danske Invest Horisont Aksje	0,000		0,896	***	0,593

*Where: * means significant at 10% level, ** significant at 5% level, *** significant at 1% level. The table presents the results from the 1-factor regression model performed on each of the 11 matched pairs under the full sample period (8 years). The first fund in each pair is an SRI fund. Negative (positive) alpha values indicate an underperformance (outperformance) of the funds relative to the market. The beta values represent the fund`s exposure to market risk premium, while the adjusted R squared values in the right column measures the models explanatory power.*

The table shows three positive alpha values for the ethical funds, while none for the conventional. We also observe that ethical funds slightly outperform their conventional peers in all pairs except from pair 1,3,4 and 6. At the 5% level four funds have significant alpha values, only one of them being positive (Storebrand Global Verdi). Vekterfond Aksjer I has a significant negative alpha at the 1% level.

Table 7: Results; 1-factor model (8 years) – aggregated level

Portfolio	Alpha	Beta		Adjusted R^2
Ethical	-0,001	0,944	***	0,915
Conventional	-0,002	0,909	***	0,835
Difference	0,001 *	0,035		0,011

*Where: * means significant at 10% level, ** significant at 5% level, *** significant at 1% level. The table presents the results from the 1-factor regression for the SRI, conventional and difference portfolios in the full sample period. From left to right, the alpha, beta and adjusted R squared values are presented. Negative (positive) alphas indicate an underperformance (outperformance) of the portfolios relative to the market.*

Table 7 presents the regression results at aggregated level. We observe negative alpha values for both the ethical and conventional portfolio (although not significant). The difference portfolio shows a positive alpha of 0.001, significant at the 10% level, indicating that the ethical portfolio slightly outperforms the conventional.

The above results indicate that the ethical funds tend to outperform the conventional slightly at an overall level. However, from these results we cannot reject Hypothesis 1 that there is no difference between the financial performance of SRI funds and conventional funds. This conclusion is based on the results showing minimal differences and few statistically significant alpha values.

Sub-period (I): 2010-2013

Appendix 2 presents the regression results on fund level in sub-period (I). We observe three positive alpha values for the ethical funds, and none for the conventional. None of these results are statistically significant. Similar to the results in the full sample period the ethical funds slightly outperform their conventional peers in seven of the 11 pairs. Pair four shows significant alpha values for both the ethical (at the 1% level) and conventional (at the 5% level) fund, where the ethical fund underperforms the conventional by 0.2 percentage points.

Table 8: Results; 1-factor model sub-period (I) – aggregated level

Portfolio	Alpha	Beta		Adjusted R^2
Ethical	-0,001	0,939	***	0,872
Conventional	-0,003	0,943	***	0,770
Difference	0,001	-0,004		-0,022

*Where: * means significant at 10% level, ** significant at 5% level, *** significant at 1% level. The table presents the results from the 1-factor regression for the SRI, conventional and difference portfolios in sub-period (I). From left to right, the alpha, beta and adjusted R squared values are presented. Negative (positive) alphas indicate an underperformance (outperformance) of the portfolios relative to the market.*

Table 8 shows the results at an aggregate level. Although none of the values are significant, they do indicate the ethical portfolio underperforms the market *less* than the conventional. Similarly, the difference portfolio shows a positive alpha of 0.001, although not significant. The results from sub-period (I) lead us to a similar conclusion as for the full sample period. The SRI funds slightly outperform the conventional at an overall level, although the results are not statistically significant and we can thereby not reject Hypothesis 1.

Sub-period (II): 2014-2017

The regression results on fund level for sub-period (II) are presented in Appendix 3. The results are similar to the ones presented above, although none of the values are statistically significant. There also seems to be even less differences between the ethical and conventional fund´s performance.

Table 9: Results; 1-factor model sub-period (II) – aggregated level

Porfolio	Alpha	Beta		Adjusted R^2
Ethical	0	0,940	***	0,940
Conventional	-0,001	0,874	***	0,883
Difference	0,001	0,067	**	0,073

*Where: * means significant at 10% level, ** significant at 5% level, *** significant at 1% level. The table presents the results from the 1-factor regression for the SRI, conventional and difference portfolios in sub-period (I). From left to right, the alpha, beta and adjusted R squared values are presented. Negative (positive) alphas indicate an underperformance (outperformance) of the portfolios relative to the market.*

In table 9 the results at an aggregated level are presented. While the ethical portfolio has an alpha of zero, the conventional has an alpha of -0.001. The difference portfolio shows a positive alpha value of 0.001. As the differences are small and none of the alphas are statistically significant, we can also here conclude that we do not have empirical evidence suggesting that there are any differences in the financial performance of SRI funds compared to conventional funds.

7.2 Portfolio level analysis: Carhart´s 4-factor model

To analyze the financial performance of SRI funds relative to conventional funds, additional regressions based on Carhart´s 4-factor model was run at portfolio level. As explained in section 6.2.2, portfolios were constructed as weighted averages of the full sample of 32 SRI funds and 42 conventional funds (see Appendix 4 for full sample). The results from these regressions are presented in table 10. In the following the results will be presented and discussed, mainly focusing on general tendencies and significant findings.

Full sample period: 2010-2017

During the full sample period the ethical portfolio slightly outperforms the conventional, with positive alphas of 0.004 and 0.003, respectively. Similarly, the difference portfolio shows a positive alpha, indicating that the SRI portfolio outperforms the conventional by 0.1%. However, neither of these results are statistically significant. The beta values for the market premium, β_1, are similar for the SRI and conventional portfolio with values of 0.519 and 0.510, respectively. These results are significant at the 1% level, indicating that both portfolios are exposed to the market factor.

The SMB beta (β_2) is positive for both portfolios, denoting that they are biased towards small-cap stocks. The HML beta (β_3) shows negative values for both the SRI and conventional portfolio, indicating a negative relationship with the value premium. However, neither of these results are significant. The results of the difference portfolio indicate that the SRI portfolio is more exposed to both factors, with beta values β_2 and β_3 of 0.038 and 0.114, respectively. The factor loading of SMB is significant at the 1% level. We further observe that the conventional portfolio potentially is more exposed to the momentum factor, as β_4 for the difference portfolio shows a negative (non-significant) value of -0.012.

Sub-Period 1: 2010-2013

Both portfolios show positive alpha values of 0.001 in sub-period (I), indicating that they outperform the market equally. However, the results are not significant. The market premium betas (β_1) are similar for the SRI and conventional portfolios, with values of 0.469 and 0.458 respectively. Both values are significant at the 1% level, indicating that the portfolios are significantly exposed to the

market factor. As seen in table 10, none of the other factor loadings in sub-period (I) are significant. The results show positive values for all three factors (β_1, β_2, β_3) for both the SRI and conventional portfolios, as well as for the difference portfolio. The latter indicates that the SRI portfolio is slightly more exposed to all three factors.

Sub-Period 2: 2014-2017

Similar to the results presented above, we observe positive alphas of 0.005 and 0.004 for the SRI and conventional portfolio, respectively. The difference portfolio shows an alpha of 0.001, indicating that the SRI portfolio slightly outperforms the conventional. None of these results are statistically significant. With similar β_1 values of 0.581 (SRI) and 0.575 (conventional), significant at the 1% level, both portfolios are significantly exposed to the market premium.

As to be seen in table 10, all the following beta values (β_1, β_2, β_3) are insignificant in sub-period (II). We observe from the factor loadings of the difference portfolio that the SRI portfolio seems more exposed to the market- and value premium, while less exposed to the momentum factor compared to the conventional portfolio.

Table 10: Results; 4-factor model

FULL SAMPLE PERIOD: 2010 - 2017						
Portfolio	Alpha	B(Rm-Rf)	B(SMB)	B(HML)	B(MOM)	Adjusted R^2
Ethical Portfolio	0,004	0,519 ***	0,049	-0,023	0,082	0,425
Regular Portfolio	0,003	0,510 ***	0,011	-0,136	0,094	0,452
Difference Portfolio	0,001	0,009	0,038	0,114 ***	-0,012	0,082

SUB-PERIOD (I): 2010 - 2013						
Portfolio	Alpha	B(Rm-Rf)	B(SMB)	B(HML)	B(MOM)	Adjusted R^2
Ethical Portfolio	0,001	0,469 ***	0,144	0,172	0,184	0,540
Regular Portfolio	0,001	0,458 ***	0,109	0,091	0,173	0,540
Difference Portfolio	0,001	0,011	0,035	0,081	0,011	-0,015

SUB-PERIOD (II): 2014 -2017						
Portfolio	Alpha	B(Rm-Rf)	B(SMB)	B(HML)	B(MOM)	Adjusted R^2
Ethical Portfolio	0,005	0,581 ***	0,036	-0,231	-0,064	0,302
Regular Portfolio	0,004	0,575 ***	-0,002	-0,349	-0,025	0,362
Difference Portfolio	0,001	0,006	0,038	0,118	-0,038	0,098

*Where: * means significant at 10% level, ** significant at 5% level, *** significant at 1% level. The table presents the results from Carhart`s 4-factor regression model at portfolio level from the full sample period, sub-period (I) and (II). The regression is run on the SRI portfolio, the conventional portfolio and the difference portfolio for each of the studied periods. A thorough description of the four factors in the model is provided under "Model specifications" for the 4-factor model in section 5.1.2.*

From the above-presented results we observe positive alpha values of 0.001 for the difference portfolio during the full period of eight years and the two sub-periods. Although this indicates a pattern of the SRI portfolio outperforming the conventional, the results show that the performance gap is insignificant. We can thereby not reject Hypothesis 1 based on the results of Carhart´s 4-factor model. We further observe that there are no significant changes in the performance of SRI funds relative to conventional funds from sub-period (I) to (II). We can thereby not reject Hypothesis 2 based on these results.

7.3 Robustness of results

7.3.1 1-factor model

As the 1-factor regression model only includes funds with available data for the full sample period, the sample suffers from survivorship bias. We therefor need to be aware that the results could be overestimated to some degree. Applying comparative analysis can to some extent control for this problem, which we have done by constructing a difference portfolio. Further analyzing the models' adjusted R^2 gives an indication of it´s explanatory power. Amongst the 22 funds in the 1-factor model, three funds have adjusted R^2 below 0.7 in the full sample period, ten funds in sub-period (I) and two funds in sub-period (II). The F-tests show that all those values are greater than zero at the 1% level. At aggregated level we observe that both the ethical and conventional portfolio have high adjusted R^2 values in all three periods. The difference portfolio on the other hand shows relatively low values, none of them being statistically different from zero. However, this was expected in accordance with previous research (Bauer et al., 2005; Bauer et al., 2007).

Three diagnostic tests were executed to further determine the accuracy of the results. The results from these tests at fund- and aggregated level are presented in Appendix 5. To test the assumption of normality, the Shapiro-Wilk test was used. For the ethical funds we observe that the null hypothesis of normally distributed error terms is rejected in 55%, 45% and 36% of the cases in the full sample period, sub-period (I) and (II), respectively. For the conventional funds, H0 is rejected in 55%, 18% and 55% of the cases during the same periods. At portfolio level, H0 is rejected for both portfolios in every period, except for the

conventional portfolio in sub-period (I). Due to the large sample size, cases of non-normality are most likely due to outliers. Breusch-Pagan and Koenker tests were used to test for heteroscedasticity. At fund level, the null hypothesis of homoscedasticity is rejected in 23%, 0% and 50% of the cases in the full sample period, sub period (I) and (II), respectively. The results at aggregated level show signs of heteroscedasticity in sub-period (II) for the ethical portfolio, while in the full sample period and sub-period (II) for the conventional portfolio. To test for autocorrelation, values obtained from the Durbin-Watson (DW) tests where analyzed. The results show little sign of autocorrelation both at fund- and aggregated level.

The conclusion from the 1-factor model will be drawn from the results as they are presented, though also having in mind the results from the diagnostic tests.

7.3.2 4-factor model

Observing adjusted R^2 from the 4-factor regressions, we notice that the values are considerably lower than for the 1-factor model. This might indicate that the multifactor model is less capable than the 1-factor model in explaining aggregate fund returns in this study. Although none of the values exceed 0.7, they all are statistically different from zero looking at the F-test. Similar to the 1-factor model, the adjusted R^2 values are low for the difference portfolio inn all periods.

The results from the diagnostic tests on the 4-factor regression models are presented in Appendix 6. The Shapiro-Wilk tests show that the null hypothesis of normally distributed error terms is rejected for both portfolios in all periods, except for the conventional portfolio in sub-period (I). These results are, similar to the 1-factor model, most likely due to outliers. Further to that, there seems to be no sign of heteroscedastic residuals for any of the portfolios over the three time-periods examined. The Durbin-Watson test results show no sign of autocorrelation for any of the portfolios. Lastly, the results of the VIF-test show that the null hypothesis of multicollinearity is rejected in all periods for both portfolios.

The presented results from various diagnostic tests lead us to confidently draw conclusions from the 4-factor model from the results as they are presented.

7.4 Traditional performance measures

With the aim of strengthening the robustness of the matched pair analysis presented, additional performance measures to the most traditional method (Jensen´s alpha) were estimated. Based on the matched funds and their respective index benchmarks, monthly return, risk premium and standard deviation, the following risk-adjusted performance measures were estimated: Sharpe ratio, adjusted Sharpe ratio, Treynor´s measure, IR, adjusted IR and M^2. The results from these measures are presented at fund- and pair level in Appendix 7-8.

In the following section the results are presented and discussed, mainly focusing on the performance of SRI funds. Across the 22 funds, the results are ranked based on performance, 1 being the top ranked fund. The presentation will be limited to discussing the top and bottom three ranked funds on each measure, as well as how the SRI funds perform compared to their conventional peers at an overall level.

7.4.1 Fund-level performance

The Sharpe ratio results show that, during the full sample period, the three highest ranked funds are SRI funds, while only conventional funds are amongst the three bottoms. We observe different results in the two sub-periods, where SRI funds have two out of three top rankings in both periods, while two bottom rankings in sub-period (I) and none in sub-period (II). At pair level we observe that the SRI funds outperform their conventional peers eight, six and seven out of 11 possible times in the full sample period and sub-period (I) and (II), respectively. Further analyzing the results from the Modified Sharpe ratio, SRI funds also here represent the top three rankings during the full sample period, and two out of three top rankings in both sub-periods. There are no SRI funds among the bottom rankings in any of the periods. The results at pair-level show identical results to the ones for Sharpe ratio.

The results from Treynor´s measure show that SRI funds represent the three top rankings during the full sample period, while two in the following sub-periods. Only one SRI fund is amongst the bottom ranked during all three periods (in sub-period (I)). Out of 11 possible outcomes, the SRI funds outperform their conventional peers eight times during the full sample period, and six times in both

sub-periods. Further analyzing the M^2 ratio, we find similar results as the ones presented above. Two SRI funds are ranked amongst the top three during the full sample period and sub-period (I), and three in sub-period (II). During sub-period (I) two SRI funds are amongst the bottom three, while no SRI funds are bottom ranked in the full sample period or sub-period (II). The number of SRI funds outperforming their conventional peers on the M^2 measure is identical to the results from the Sharpe- and Modified Sharpe ratio.

Results from the information ratio show that SRI funds have three top rankings and one bottom ranking for the full sample period as well as for the first sub-period. In sub-period (II) the SRI funds have two top rankings and no bottom rankings. The SRI funds also outperform their matched peers eight out of eleven possible times for all three periods. The modified information ratio shows similar results, with seven SRI funds outperforming their conventional peers both in the full sample period and the two sub-periods.

The above results indicate a pattern of SRI funds outperforming their conventional peers on all risk-adjusted performance measures, although it should be noted that the differences are small. The SRI funds obtain no less than two out of three top rankings for all measures in either period. At pair-level we observe that more than half of the SRI funds outperform their conventional peers on all measures, and there are no clear patters of differences between the two sub-periods.

7.4.2 Portfolio Level Performance

The six additional performance measures were also estimated at aggregated level. The results are presented in table 11. The results show that the SRI portfolio outperforms the conventional on all performance measures, during both the full sample period and the two sub-periods. These results support the findings at fund-level presented above. Although one can see a pattern of the SRI portfolio outperforming the conventional, the differences are rather small.

Table 11: Results: Traditional performance measures (aggregated level)

	SHARPE RATIO					
Portfolio	2010-2017	RANK	2010-2013	RANK	2014-2017	RANK
SRI	-0,0842	1	-0,3493	1	0,1396	1
Conventional	-0,1270	2	-0,3683	2	0,1033	2

	MODIFIED SHARPE RATIO					
Portfolio	2010-2017	RANK	2010-2013	RANK	2014-2017	RANK
SRI	-0,00007	1	-0,00025	1	0,1396	1
Conventional	-0,00011	2	-0,00030	2	0,1033	2

	TREYNOR INDEX					
Portfolio	2010-2017	RANK	2010-2013	RANK	2014-2017	RANK
SRI	-0,0027	1	-0,0099	1	0,0050	1
Conventional	-0,0042	2	-0,0111	2	0,0037	2

	M&M					
Portfolio	2010-2017	RANK	2010-2013	RANK	2014-2017	RANK
SRI	-0,00069	1	-0,00089	1	-0,00025	1
Conventional	-0,00196	2	-0,00139	2	-0,00144	2

	INFORMATION RATIO					
Portfolio	2010-2017	RANK	2010-2013	RANK	2014-2017	RANK
SRI	-0,07264	1	-0,09065	1	-0,05007	1
Conventional	-0,15162	2	-0,15071	2	-0,15398	2

	MODIFIED INFORMATION RATIO					
Portfolio	2010-2017	RANK	2010-2013	RANK	2014-2017	RANK
SRI	-0,000006	1	-0,000009	1	-0,000003	1
Conventional	-0,000024	2	-0,000031	2	-0,000019	2

The table presents the results from the six additional performance measures at portfolio level, estimated for the full sample period, as well as sub-period (I) and (II). The measures are estimated for the SRI portfolio and conventional portfolio, each constructed as weighted average returns of the 11 SRI funds and 11 conventional funds in the matched pair analysis. Further explanations of the performance measures can be found under "Model specifications", section 5.1.3.

7.5 Interpreting the results

In this section the above-presented results will be interpreted and discussed in relation to the two research questions this study aims at answering:

1) Are there any differences in the financial performance of SRI funds compared to conventional funds on the Norwegian mutual fund market?

2) Has there been a development (positive/negative) in the financial performance of SRI funds from sub-period (I) to sub-period (II)?

The following discussion will thereby be divided in two parts, the first focusing on the full sample period of eight years, and the second focusing on the results obtained for the two sub-periods.

7.5.1 Hypothesis 1: Evaluating performance - full research period (8years)

To analyze the matched pairs, several tests and regressions were run. The results from the paired samples t-test at aggregated level showed that the SRI portfolio outperformed the conventional by 0.127%, significant at the 10% level. We further observed from the 1-factor regression at pair level that seven out of 11 SRI funds outperformed their conventional peers. However, few of these results were statistically significant. At portfolio level, the 1-factor model estimated a positive alpha of 0.1% for the difference portfolio, significant at the 10% level. This denotes that the SRI portfolio slightly outperformed the conventional. We observe the same patters when estimating the additional performance measures on the "matched pair" sample. Overall, there is an overweight of SRI funds outperforming their conventional peers on all six measures. Similarly, the measures at aggregated level show that the SRI portfolio perform better on all measures, although the differences are small.

To analyze the full sample of 32 SRI funds and 42 conventional funds, Carhart´s 4-factor model was used in a regression. Even though also these results weigh in favor of the SRI funds performing better than the conventional, none of the alpha values are significant.

To sum up the results, we observe an overall pattern of SRI funds outperforming conventional funds. However, with few statistically significant results (none at the 5% level), and rather small performance gaps, we do not have enough empirical evidence to reject Hypothesis 1. These results strongly indicate that investors can invest in alignment with their ethical standards without sacrificing financial return.

7.5.2 Hypothesis 2: Evaluating performance – sub-period (I) and (II)

Results from the paired samples t-test show no clear differences between the performance of SRI funds in sub-period (I) and (II). Seven out of 11 SRI funds obtain higher returns that their conventional peers in both periods. At portfolio level, the mean differences are 0.1268% and 0.1295% for sub-period (I) and (II) respectively. Positive values indicate that the SRI portfolio outperforms the conventional in both periods, but the difference between the periods is minimal (0.0027%). Neither of these results are statistically significant. Further supporting

these findings, the results from the 1-factor regressions are similar; the difference portfolio´s positive alphas of 0.001 in both periods indicate that the ethical portfolio outperforms the conventional. However, none of the alpha values estimated in the two sub-periods are statistically significant. The results from the 4-factor regression model lead to similar conclusions.

Summing up the results, we se no pattern of SRI funds performing better/worse compared to conventional funds across the two sub-periods. We can thereby conclude that we do not have empirical evidence to reject Hypothesis 2.

8 CONCLUSION

Along with the growing interest in Socially Responsible Investing (SRI), investors and researchers worldwide have been asking questions on the relationship between SRI and financial performance: Is there a trade-off between the two, or can SRI actually create added value? Researchers have for the past decades tried to answer these questions, often by comparing the performance of SRI funds to conventional funds of similar characteristics. The opinions and empirical findings are contradictory, although most studies find no significant differences between the two.

Norway is known to be in the forefront of SRI, with a great part of its total amount of capital heavily invested according to environmental, social and governmental standards. However, little research has been done on the Norwegian SRI market. The aim of this study has therefore been to evaluate the financial performance of Norwegian SRI mutual funds that invests globally. The SRI funds are compared to conventional funds with similar characteristics, as well as relevant index benchmarks, over the time period of January 2010 to December 2017.

The findings of this study indicate an overall pattern of SRI funds outperforming conventional funds. However, the differences in performance are small, and few of the results are statistically significant. We conclude that we do not have enough empirical evidence suggesting that there are any differences in performance of SRI funds and conventional funds in the Norwegian market. Alongside a

continuously increasing interest towards SRI, we further aimed at examining whether there has been a development in the performance of SRI funds over the time period of our research. Sub-period (I) from 2010-2013 and sub-period (II) from 2014-2017 were analyzed separately, finding no significant differences.

There has been an increasing interest among investors to align their investments with personal values and ethical standards. The results from this study strongly indicate that investors can incorporate those factors into the investment decision without sacrificing financial returns.

REFERENCES

Bauer, R., Koedijk, K., & Otten, R. (2005). International evidence on ethical mutual fund performance and investment style. *Journal of Banking & Finance*, *29*(7), 1751-1767.

Bauer, R., Derwall, J., & Otten, R. (2007). The ethical mutual fund performance debate: New evidence from Canada. *Journal of Business Ethics*, *70*(2), 111-124.

Carhart, M. M. (1997). On persistence in mutual fund performance. *The Journal of finance*, *52*(1), 57-82.

Cortez, M. C., Silva, F., & Areal, N. (2009). The performance of European socially responsible funds. *Journal of Business Ethics*, *87*(4), 573-588.

Dimson, E., Kreutzer, I., Lake, R., Sjo, H., & Starks, L. (2013). Responsible Investment and the Norwegian Government Pension Fund Global (Main Report). Retrieved from:
https://www.regjeringen.no/contentassets/67729d894e5745678a4988d86f210aea/sc_mainrreport.pdf

El Ghoul, S., & Karoui, A. (2017). Does corporate social responsibility affect mutual fund performance and flows?. *Journal of Banking & Finance*, *77*, 53-63.

European Commission. (2011). Communication from the commission to the European Parliament, the Council, the European economic and social committee and the committee of the regions*: A renewed EU strategy 2011-14 for Corporate Social Responsibility*. Retrieved from:

https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A52011DC0681

Eurosif. (2012). European SRI Study 2012. Retrieved from:
http://www.eurosif.org/wp-content/uploads/2014/05/eurosif-sri-study_low-res-v1.1.pdf

Eurosif. (2016). European SRI study 2016. Retrieved from:
http://www.eurosif.org/wp-content/uploads/2016/11/SRI-study-2016-HR.pdf

Fama, E. F., & French, K. R. (1993). Common risk factors in the returns on stocks and bonds. *Journal of financial economics*, *33*(1), 3-56.

Friedman, M. (1962). Capitalism and Freedom, (with new preface in 40th anniversary edition in 2002).

Gil-Bazo, J., Ruiz-Verdú, P., & Santos, A. A. (2010). The performance of socially responsible mutual funds: the role of fees and management companies. *Journal of Business Ethics*, *94*(2), 243-263.

Goldreyer, E. F., & Diltz, J. D. (1999). The performance of socially responsible mutual funds: incorporating sociopolitical information in portfolio selection. *Managerial Finance*, *25*(1), 23-36.

Government (2017). The Government Pension Fund. Retrieved from:
https://www.regjeringen.no/en/topics/the-economy/the-government-pension-fund/id1441/

Gregory, A., Matatko, J., & Luther, R. (1997). Ethical unit trust financial performance: small company effects and fund size effects. *Journal of Business Finance & Accounting*, *24*(5), 705-725.

GSIA (2016). Global Sustainable Investment Review. Retrieved from:
http://www.gsi-alliance.org/wp-content/uploads/2017/03/GSIR_Review2016.F.pdf

Hamilton, S., Jo, H., & Statman, M. (1993). Doing well while doing good? The investment performance of socially responsible mutual funds. *Financial Analysts Journal*, *49*(6), 62-66.

Jaggi, B., & Freedman, M. (1992). An examination of the impact of pollution performance on economic and market performance: pulp and paper firms. *Journal of Business Finance & Accounting*, *19*(5), 697-713.

Jensen, M. C. (1968). The performance of mutual funds in the period 1945–1964. *The Journal of finance*, *23*(2), 389-416.

Kempf, A., & Osthoff, P. (2007). The effect of socially responsible investing on portfolio performance. *European Financial Management*, *13*(5), 908-922.

Kreander, N., Gray, R. H., Power, D. M., & Sinclair, C. D. (2005). Evaluating the performance of ethical and non-ethical funds: a matched pair analysis. *Journal of Business Finance & Accounting*, *32*(7-8), 1465-1493.

Mallin, C. A., Saadouni, B., & Briston, R. J. (1995). The financial performance of ethical investment funds. *Journal of Business Finance & Accounting*, *22*(4), 483-496.

McGuire, J. B., Sundgren, A., & Schneeweis, T. (1988). Corporate social responsibility and firm financial performance. *Academy of management Journal*, *31*(4), 854-872.

Porter, M.E., Kramer M.R. (2006). Strategy and Society: The Link Between Competitive Advantage and Corporate Social Responsibility, Harvard Business Review, 84:12, 78-92.

Porter, M. E., & Kramer, M. R. (2011). The big idea: Creating shared value.

Responsible Business. (2013). Norges Bank Investment Management bryter OECDs retningslinjer. Retrieved from:
http://nettsteder.regjeringen.no/ansvarlignaringsliv2/nyheter/norges-bank-investment-management-bryter-oecds-retningslinjer/

Singh, R., & Pachar, S. (2012) Stakeholders Insight Towards Impact of Organisations CSR Policy on Financial Performance: An Exploratory Study in Indian Context.

Statman, M. (2000). Socially responsible mutual funds (corrected). *Financial Analysts Journal*, *56*(3), 30-39.

Ullmann, A. A. (1985). Data in search of a theory: A critical examination of the relationships among social performance, social disclosure, and economic performance of US firms. *Academy of management review*, *10*(3), 540-557.

US-SIF. (2017). SRI Basics. Retrieved from: https://www.ussif.org/sribasics

APPENDICES

Appendix 1: Fund sample for matched pair analysis

Pair	Ethical/conventional	Fund name	Investment universe (Morningstar category)	Age (launch date)	Size (mill. Kr)	Index benchmark / *Morningstar index*
1	**Ethical**	C World globale aksjer etisk	Global, large firms, growth	28.12.00	1294,71	MSCI ACWI NR USD / *MSCI World Growth NR USD*
1	**Conventional**	C Worldwide globale aksjer	Global, large firms, growth	10.09.95	1285,01	MSCI ACWI NR USD / *MSCI World Growth NR USD*
2	**Ethical**	Delphi Global	Global, large firms, growth	23.05.06	2967,74	MSCI World NR USD / *MSCI World Growth NR USD*
2	**Conventional**	Holberg Global A	Global, large firms, mix	15.12.00	2017,33	MSCI World NR USD / *MSCI World NR USD*
3	**Ethical**	DNB Aktiv 100	Global, large firms, mix	26.09.05	4382,07	80% MSCI ACWI NR USD, 20% OSE FXLT Mutual Fund Index Linked/TOTX / *MSCI World NR USD*
3	**Conventional**	Pareto Global A	Global, large firms, mix	12.08.05	5403,45	MSCI World NR USD / *MSCI World NR USD*
4	**Ethical**	Alfred Berg Global Quant	Global, large firms, mix	31.10.94	175,76	MSCI World NR USD / *MSCI World NR USD*
4	**Conventional**	Landkreditt Aksje Global	Global, large firms, mix	15.11.05	270,09	MSCI ACWI NR USD / *MSCI World NR USD*
5	**Ethical**	Fondsfinans Global Helse	Bransjefond, Healthcare	27.06.00	365,09	Not Benchmarked / *MSCI World/Health Care NR USD*
5	**Conventional**	C Worldwide Medical	Bransjefond, Healthcare	17.09.99	152,2	MSCI World/Health Care NR USD / *MSCI World/Health Care NR USD*
6	**Ethical**	Eika Global	Global, large firms, mix	01.06.01	1600,45	MSCI World NR USD / *MSCI World NR USD*
6	**Conventional**	Danske Invest Investeringsprofil Aksjer	Global, large firms, mix	07.09.06	1282,21	80% MSCI World NR USD, 20% OSE FXLT Mutual Fund Index Linked/TOTX / *MSCI World NR USD*
7	**Ethical**	DNB Global (IV)	Global, large firms, mix	20.09.04	26683,74	MSCI World NR USD / *MSCI World NR USD*
7	**Conventional**	Skagen Global A NOK	Global, large firms, mix	07.08.97	24853,67	MSCI ACWI NR USD / *MSCI World NR USD*
8	**Ethical**	Nordea Stabile Aksjer Global Etisk	Global, large firms, value	10.11.08	8009,24	Not Benchmarked / *MSCI World Value NR USD*
8	**Conventional**	Skagen Vekst A NOK	Gloab, fleksibel kapitalisering	01.12.93	7734,53	MSCI Nordic IMI + ACWI ex Nordic NR NOK / *MSCI World NR USD*
9	**Ethical**	Pluss Utland Etisk	Global, large firms, mix	17.10.06	28,01	MSCI World NR USD / *MSCI World NR USD*
9	**Conventional**	Vekterfond Aksje I	Global, large firms, mix	18.12.06	56,16	80% MSCI World NR USD, 20% OSE FXLT Mutual Fund Index Linked/TOTX / *MSCI World NR USD*
10	**Ethical**	Storebrand Aksjespar	Global, large firms, mix	01.07.81	1045,38	75% MSCI All Countries (Local Ccy), 25% OSEBX TR NOK / *MSCI World NR USD*
10	**Conventional**	Fram Global	Global, large firms, mix	01.03.06	66,31	MSCI World NR USD / *MSCI World NR USD*
11	**Ethical**	Storebrand Global Verdi	Global, large firms, value	05.11.97	1163,13	MSCI World NR USD / *MSCI World Value NR USD*
11	**Conventional**	Danske Invest Horisont Aksje	Global, large firms, value	05.01.05	4737,06	50% MSCI World NR EUR, 50% OSE Oslo Børs Mutual Fund TR NOK / *MSCI World Value NR USD*

The table presents the 11 matched SRI funds and conventional funds with respective; Investment universe (portfolio weights), age, size and index benchmarks. Each fund is presented with two index benchmarks; the one chosen by the fund, and the one chosen by Morningstar.

Appendix 2: Results; 1-factor model sub-period (I) – fund level

Pair	Fund name	Alpha		Beta		Adjusted R^2
1	C WorldWide Globale Aksjer Etisk	-0,004	*	0,888	***	0,768
	C Worldwide Globale Aksjer	-0,003		0,872	***	0,726
2	Delphi Global	0,001		0,979	***	0,634
	Holberg Global A	-0,002		0,985	***	0,667
3	DNB Aktiv 100	-0,003		1,025	***	0,612
	Pareto Global A	-0,001		0,854	***	0,732
4	Alfred Berg Global Quant NOK	-0,004	***	0,931	***	0,858
	Landkreditt Aksje Global	-0,002	**	0,929	***	0,954
5	Fondsfinans Global Helse	-0,001		0,746	***	0,660
	C WorldWide Medical	0,000		0,945	***	0,820
6	Eika Global	-0,002		0,948	***	0,751
	Danske Invest Investeringsprofil Aksjer	-0,004	*	0,961	***	0,770
7	DNB Global (IV)	0,001		1,031	***	0,875
	SKAGEN Global A NOK	-0,001		0,955	***	0,644
8	Nordea Stabile Aksjer Global Etisk	-0,002		0,631	***	0,566
	SKAGEN Vekst A NOK	-0,004		1,005	***	0,488
9	PLUSS Utland Etisk	-0,003		1,050	***	0,754
	Vekterfond Aksjer I	-0,004	*	0,960	***	0,770
10	Storebrand Aksjespar	-0,002		0,998	***	0,673
	FRAM Global	-0,007		0,895	***	0,416
11	Storebrand Global Verdi	0,002		0,919	***	0,803
	Danske Invest Horisont Aksje	0,000		0,995	***	0,498

*Where: * means significant at 10% level, ** significant at 5% level, *** significant at 1% level. The table presents the results from the 1-factor regression model performed on each of the 11 matched pairs under sub-period (I). The first fund in each pair is an SRI fund. Negative (positive) alpha values indicate an underperformance (outperformance) of the funds relative to the market. The beta values represent the fund`s exposure to market risk premium, while the adjusted R squared values in the right column measures the models explanatory power.*

Appendix 3: Results; 1-factor model sub-period (II) – fund level

Pair	Fund name	Alpha	Beta		Adjusted R^2
1	C WorldWide Globale Aksjer Etisk	0,000	1,029	***	0,821
	C Worldwide Globale Aksjer	0,000	1,047	***	0,845
2	Delphi Global	-0,001	0,974	***	0,841
	Holberg Global A	0,002	0,790	***	0,717
3	DNB Aktiv 100	-0,001	0,812	***	0,845
	Pareto Global A	-0,003	0,959	***	0,737
4	Alfred Berg Global Quant NOK	-0,001	0,968	***	0,889
	Landkreditt Aksje Global	0,000	0,821	***	0,917
5	Fondsfinans Global Helse	0,002	0,795	***	0,865
	C WorldWide Medical	-0,003	1,108	***	0,843
6	Eika Global	-0,003	0,973	***	0,865
	Danske Invest Investeringsprofil Aksjer	-0,001	0,810	***	0,916
7	DNB Global (IV)	-0,001	1,008	***	0,859
	SKAGEN Global A NOK	-0,004	0,963	***	0,772
8	Nordea Stabile Aksjer Global Etisk	0,002	0,924	***	0,831
	SKAGEN Vekst A NOK	-0,002	0,794	***	0,552
9	PLUSS Utland Etisk	-0,001	1,065	***	0,915
	Vekterfond Aksjer I	-0,002	0,808	***	0,914
10	Storebrand Aksjespar	0,000	0,695	***	0,788
	FRAM Global	0,000	0,697	***	0,415
11	Storebrand Global Verdi	0,003	1,029	***	0,815
	Danske Invest Horisont Aksje	0,001	0,793	***	0,768

*Where: * means significant at 10% level, ** significant at 5% level, *** significant at 1% level. The table presents the results from the 1-factor regression model performed on each of the 11 matched pairs under sub-period (II). The first fund in each pair is an SRI fund. Negative (positive) alpha values indicate an underperformance (outperformance) of the funds relative to the market. The beta values represent the fund`s exposure to market risk premium, while the adjusted R squared values in the right column measures the models explanatory power.*

Appendix 4: Final fund sample - portfolio level analysis (4-factor model)

	SRI FUNDS	CONVENTIONAL FUNDS
1	Alfred Berg Global Quant NOK	Alfred Berg Global Deepwater Energy C I
2	C WorldWide Globale Aksjer Etisk	C Worldwide Globale Aksjer
3	Carnegie WorldWide Etisk II	C WorldWide Medical
4	Delphi Global	C WorldWide Stabile Aksjer
5	DNB Aktiv 100	Danica Pensjon Norge - Aksjer
6	DNB AM Global Valutasikret	Danske Invest Horisont Aksje
7	DNB Finans	Danske Invest Investeringsprofil Aksjer
8	DNB Global (IV)	Delphi Global Valutasikret
9	DNB Global Etisk (V)	DNB Aksjefokus
10	DNB Health Care	DNB Global (duplicate)
11	DNB Miljoinvest	DNB Global Eiendom
12	DNB Navigator (I)	DNB Global Quant
13	DNB Navigator (II)	DNB Globalspar
14	DNB Private Banking Premium 100	FORTE Global
15	DNB Teknologi	FRAM Global
16	DNB Telecom	Holberg Global A
17	Eika Global	Holberg Triton
18	Fondsfinans Global Energi	Landkreditt Aksje Global
19	Fondsfinans Global Helse	Nordea Global NOK
20	KLP AksjeGlobal Lavbeta I	Nordea Internasjonale Aksjer
21	KLP AksjeGlobal Lavbeta II	Nordea Plan 100 (Nordea aksjer verden)
22	KLP Framtid	Nordea Stabile Aksjer Global
23	Nordea Stabile Aksjer Global Etisk	ODIN Aksje C
24	PLUSS Utland Etisk	ODIN Energi C (NOK)
25	Storebrand Aksjespar	ODIN Global C
26	Storebrand Aktiv Allokering	ODIN Global II
27	Storebrand Global Multifaktor	Odin Global SMB
28	Storebrand Global Pluss	ODIN Maritim
29	Storebrand Global SRI	Omega Global
30	Storebrand Global Verdi	Pareto Global A
31	Storebrand Global Miljo Open Fund	PLUSS Utland Aksje
32	Storebrand Trippel Smart	SKAGEN Focus A NOK
33		SKAGEN Global II NOK
34		SKAGEN Global A NOK
35		SKAGEN m2 A
36		Skagen Select 100
37		SKAGEN Vekst A NOK
38		Sparebanken Vest Aksje
39		Storebrand WGA Health Care
40		Terra Global
41		Vekterfond Aksjer I
42		WarrenWicklund Teknologi

The table present the final fund sample of 32 SRI funds and 42 conventional funds, used in the portfolio level analysis (Carhart`s 4-factor model). The funds are selected based on the specifications presented in section 6.2 Data Filtering.

Appendix 5: Robustness test 1-factor model

FUND LEVEL

FULL SAMPLE PERIOD

Test	SRI funds		Conventional funds	
	H0 Rejected	H0 Not rejected	H0 Rejected	H0 Not rejected
Shapiro-Wilk test	6	5	6	5
H0: Normal distribution				
Breush-Pagan & Koenker test	2	9	3	8
H0: Homoscedasticity				
Durbin Watson test	10	1	11	0
H0: Autocorrelation				

SUB-PERIOD (I)

Test	SRI funds		Conventional funds	
	H0 Rejected	H0 Not rejected	H0 Rejected	H0 Not rejected
Shapiro-Wilk test	5	6	2	9
H0: Normal distribution				
Breush-Pagan & Koenker test	0	11	0	11
H0: Homoscedasticity				
Durbin Watson test	9	2	11	0
H0: Autocorrelation				

SUB-PERIOD (II)

Test	SRI funds		Conventional funds	
	H0 Rejected	H0 Not rejected	H0 Rejected	H0 Not rejected
Shapiro-Wilk test	4	7	6	5
H0: Normal distribution				
Breush-Pagan & Koenker test	5	6	6	5
H0: Homoscedasticity				
Durbin Watson test	11	0	10	1
H0: Autocorrelation				

PORTFOLIO LEVEL

FULL SAMPLE PERIOD

Test	SRI porftolio		Conventional Portfolio	
	H0 Rejected	H0 Not rejected	H0 Rejected	H0 Not rejected
Shapiro-Wilk test	x		x	
H0: Normal distribution				
Breush-Pagan & Koenker test		x	x	
H0: Homoscedasticity				
Durbin Watson test	x		x	
H0: Autocorrelation				

SUB-PERIOD (I)

Test	SRI porftolio		Conventional Portfolio	
	H0 Rejected	H0 Not rejected	H0 Rejected	H0 Not rejected
Shapiro-Wilk test	x			x
H0: Normal distribution				
Breush-Pagan & Koenker test		x		x
H0: Homoscedasticity				
Durbin Watson test	x		x	
H0: Autocorrelation				

SUB-PERIOD (II)

Test	SRI porftolio		Conventional Portfolio	
	H0 Rejected	H0 Not rejected	H0 Rejected	H0 Not rejected
Shapiro-Wilk test	x		x	
H0: Normal distribution				
Breush-Pagan & Koenker test	x		x	
H0: Homoscedasticity				
Durbin Watson test	x		x	
H0: Autocorrelation				

The table presents the results from the robustness tests for the 1-factor regressions at fund level (left side) and portfolio level (right side) in the full sample period, as well as sub-period (I) and (II). At fund level, the numbers stand for how many funds reject (or not) H0 in each test. At portfolio level, the x`s tell whether H0 is rejected for that particular portfolio (SRI or conventional) in each test.

Appendix 6: Robustness test 4-factor model

FULL SAMPLE PERIOD

	SRI porftolio		Conventional Portfolio	
Test	**H0 Rejected**	**H0 Not rejected**	**H0 Rejected**	**H0 Not rejected**
Shapiro-Wilk test	x		x	
H0: Normal distribution				
Breusch-Pagan & Koenker test		x		x
H0: Homoscedasticity				
Durbin Watson test	x		x	
H0: Autocorrelation				
VIF-test	x		x	
H0: Multicollinearity				

SUB-PERIOD (I)

	SRI porftolio		Conventional Portfolio	
Test	**H0 Rejected**	**H0 Not rejected**	**H0 Rejected**	**H0 Not rejected**
Shapiro-Wilk test	x			x
H0: Normal distribution				
Breusch-Pagan & Koenker test		x		x
H0: Homoscedasticity				
Durbin Watson test	x		x	
H0: Autocorrelation				
VIF-test	x		x	
H0: Multicollinearity				

SUB-PERIOD (II)

	SRI porftolio		Conventional Portfolio	
Test	**H0 Rejected**	**H0 Not rejected**	**H0 Rejected**	**H0 Not rejected**
Shapiro-Wilk test	x		x	
H0: Normal distribution				
Breusch-Pagan & Koenker test		x		x
H0: Homoscedasticity				
Durbin Watson test	x		x	
H0: Autocorrelation				
VIF-test	x		x	
H0: Multicollinearity				

The table shows the results from the robustness tests for the 4-factor regression model at portfolio level in the full sample period, as well as sub-period (I) and (II) The x`s tell whether H0 is rejected for that particular portfolio (SRI or conventional) in each test.

Appendix 7: Results; Traditional performance measures (fund level)

SHARPE RATIO

	Pair	2010-2017	RANK	2010-2013	RANK	2014-2017	RANK
SRI funds	1 C WorldWide Globale Aksjer Etisk	-0,0881	9	**-0,4103**	**21**	0,1419	7
	2 Delphi Global	**-0,0459**	**3**	**-0,2147**	**3**	0,1207	13
	3 DNB Aktiv 100	-0,1150	16	-0,3028	8	0,1225	12
	4 Alfred Berg Global Quant NOK	-0,1271	18	**-0,4349**	**22**	0,1264	10
	5 Fondsfinans Global Helse	**-0,0051**	**1**	**-0,2036**	**2**	0,1441	6
	6 Eika Global	-0,1060	12	-0,3135	11	0,0790	18
	7 DNB Global (IV)	-0,0533	6	-0,2588	5	0,123	11
	8 Nordea Stabile Aksjer Global Etisk	-0,0495	5	-0,3722	16	**0,1768**	**2**
	9 PLUSS Utland Etisk	-0,1069	13	-0,3619	14	0,1285	9
	10 Storebrand Aksjespar	-0,1164	17	-0,3078	10	0,1363	8
	11 Storebrand Global Verdi	**-0,0372**	**2**	-0,2627	6	**0,1485**	**3**
Conventional funds	1 C Worldwide Globale Aksjer	-0,0744	7	-0,3779	17	0,1458	4
	2 Holberg Global A	-0,0744	8	-0,3184	12	**0,1934**	**1**
	3 Pareto Global A	-0,0945	10	-0,3039	9	0,0641	19
	4 Landkreditt Aksje Global	-0,1007	11	-0,3655	15	0,1448	5
	5 C WorldWide Medical	-0,0482	4	**-0,1883**	**1**	**0,0361**	**22**
	6 Danske Invest Investeringsprofil Aksjer	-0,1504	19	-0,3901	19	0,1119	14
	7 SKAGEN Global A NOK	-0,1114	14	-0,2764	7	**0,0436**	**20**
	8 SKAGEN Vekst A NOK	**-0,1674**	**22**	-0,3388	13	**0,0403**	**21**
	9 Vekterfond Aksjer I	**-0,1670**	**21**	**-0,4072**	**20**	0,0960	17
	10 FRAM Global	**-0,1554**	**20**	-0,3833	18	0,0996	15
	11 Danske Invest Horisont Aksje	-0,1118	15	-0,2583	4	0,0996	15

MODIFIED SHARPE RATIO

	Pair	2010-2017	RANK	2010-2013	RANK	2014-2017	RANK
SRI funds	1 C WorldWide Globale Aksjer Etisk	-0,00010	12	-0,00030	11	0,1419	7
	2 Delphi Global	-0,00005	4	**-0,00020**	**3**	0,1207	13
	3 DNB Aktiv 100	-0,00012	14	-0,00040	18	0,1225	12
	4 Alfred Berg Global Quant NOK	-0,00012	15	-0,00030	9	0,1264	10
	5 Fondsfinans Global Helse	**-0,00001**	**1**	-0,00020	4	0,1441	6
	6 Eika Global	-0,00011	13	-0,00030	10	0,0790	18
	7 DNB Global (IV)	-0,00006	5	-0,00023	7	0,1230	11
	8 Nordea Stabile Aksjer Global Etisk	**-0,00004**	**2**	**-0,00019**	**2**	**0,1768**	**2**
	9 PLUSS Utland Etisk	-0,00013	17	-0,00040	19	0,1285	9
	10 Storebrand Aksjespar	-0,00010	11	-0,00034	14	0,1363	8
	11 Storebrand Global Verdi	**-0,00004**	**3**	-0,00022	5	**0,1485**	**3**
Conventional funds	1 C Worldwide Globale Aksjer	-0,00008	8	-0,00030	12	0,1458	4
	2 Holberg Global A	-0,00007	6	-0,00034	15	**0,1934**	**1**
	3 Pareto Global A	-0,00009	9	-0,00022	6	0,0641	19
	4 Landkreditt Aksje Global	-0,00007	7	-0,00024	8	0,1448	5
	5 C WorldWide Medical	-0,00009	10	**-0,00019**	**1**	**0,0361**	**22**
	6 Danske Invest Investeringsprofil Aksjer	-0,00012	16	-0,00035	16	0,1119	14
	7 SKAGEN Global A NOK	-0,00013	18	-0,00030	13	**0,0436**	**20**
	8 SKAGEN Vekst A NOK	**-0,00022**	**22**	**-0,00054**	**21**	**0,0403**	**21**
	9 Vekterfond Aksjer I	**-0,00014**	**20**	-0,00036	17	0,096	17
	10 FRAM Global	**-0,00020**	**21**	**-0,00056**	**22**	0,0996	15
	11 Danske Invest Horisont Aksje	-0,00013	19	**-0,00042**	**20**	0,0996	16

TREYNOR INDEX

	Pair	2010-2017	RANK	2010-2013	RANK	2014-2017	RANK
SRI funds							
1	C WorldWide Globale Aksjer Etisk	-0,0030	9	-0,0127	18	0,0053	4
2	Delphi Global	**-0,0016**	**3**	**-0,0074**	**2**	0,0042	14
3	DNB Aktiv 100	-0,0041	17	-0,0106	12	0,0043	10
4	Alfred Berg Global Quant NOK	-0,0040	15	-0,0128	19	0,0043	11
5	Fondsfinans Global Helse	**-0,0002**	**1**	-0,0076	4	**0,0067**	**2**
6	Eika Global	-0,0035	13	-0,0099	8	0,0027	18
7	DNB Global (IV)	-0,0017	4	**-0,0075**	**3**	0,0043	12
8	Nordea Stabile Aksjer Global Etisk	-0,0017	5	**-0,0134**	**20**	**0,0062**	**3**
9	PLUSS Utland Etisk	-0,0035	12	-0,0114	14	0,0043	13
10	Storebrand Aksjespar	-0,0041	16	-0,0103	10	0,0049	7
11	Storebrand Global Verdi	**-0,0012**	**2**	-0,0083	5	0,0051	6
Conventional funds							
1	C Worldwide Globale Aksjer	-0,0025	7	-0,0121	15	0,0053	5
2	Holberg Global A	-0,0026	8	-0,0106	13	**0,0073**	**1**
3	Pareto Global A	-0,0033	11	-0,0097	7	0,0024	19
4	Landkreditt Aksje Global	-0,0031	10	-0,0101	9	0,0049	9
5	C WorldWide Medical	-0,0020	6	**-0,0064**	**1**	0,0017	20
6	Danske Invest Investeringsprofil Aksjer	-0,0048	19	-0,0121	16	0,0038	15
7	SKAGEN Global A NOK	-0,0039	14	-0,0095	6	**0,0016**	**22**
8	SKAGEN Vekst A NOK	**-0,0068**	**21**	**-0,0134**	**21**	**0,0017**	**21**
9	Vekterfond Aksjer I	**-0,0054**	**20**	-0,0126	17	0,0032	17
10	FRAM Global	**-0,0069**	**22**	**-0,0163**	**22**	0,0049	8
11	Danske Invest Horisont Aksje	-0,0043	18	-0,0104	11	0,0034	16

M&M

	Pair	2010-2017	RANK	2010-2013	RANK	2014-2017	RANK
SRI funds							
1	C WorldWide Globale Aksjer Etisk	-0,0010	10	**-0,0027**	**20**	-0,0003	7
2	Delphi Global	0,0000	5	**0,0023**	**3**	-0,0015	14
3	DNB Aktiv 100	-0,0021	17	-0,0001	9	-0,0014	13
4	Alfred Berg Global Quant NOK	-0,0024	19	**-0,0037**	**22**	-0,0013	11
5	Fondsfinans Global Helse	0,0009	4	0,0005	7	**0,0017**	**3**
6	Eika Global	-0,0018	13	-0,0004	12	-0,0028	19
7	DNB Global (IV)	-0,0002	6	0,0011	4	-0,0014	12
8	Nordea Stabile Aksjer Global Etisk	**0,0015**	**2**	-0,0007	14	**0,0019**	**2**
9	PLUSS Utland Etisk	-0,0018	14	-0,0017	15	-0,0012	10
10	Storebrand Aksjespar	-0,0021	18	-0,0003	11	-0,0010	9
11	Storebrand Global Verdi	**0,0034**	**1**	**0,0034**	**2**	**0,0027**	**1**
Conventional funds							
1	C Worldwide Globale Aksjer	-0,0005	7	-0,0018	16	-0,0002	6
2	Holberg Global A	-0,0008	9	-0,0006	13	0,0009	5
3	Pareto Global A	-0,0014	11	-0,0002	10	**-0,0033**	**21**
4	Landkreditt Aksje Global	-0,0016	12	-0,0018	17	-0,0007	8
5	C WorldWide Medical	-0,0007	8	0,0010	5	**-0,0030**	**20**
6	Danske Invest Investeringsprofil Aksjer	**-0,0031**	**20**	-0,0025	19	-0,0017	15
7	SKAGEN Global A NOK	-0,0019	15	0,0006	6	**-0,0040**	**22**
8	SKAGEN Vekst A NOK	-0,0020	16	0,0002	8	-0,0024	18
9	Vekterfond Aksjer I	**-0,0036**	**22**	**-0,0030**	**21**	-0,0023	17
10	FRAM Global	**-0,0033**	**21**	-0,0023	18	-0,0021	16
11	Danske Invest Horisont Aksje	**0,0012**	**3**	**0,0035**	**1**	0,0012	4

INFORMATION RATIO

	Pair		2010-2017	RANK	2010-2013	RANK	2014-2017	RANK
SRI funds	1	C WorldWide Globale Aksjer Etisk	-0,0793	10	-0,19147	16	0,0201	7
	2	Delphi Global	-0,0104	5	0,04177	5	-0,0915	11
	3	DNB Aktiv 100	-0,1275	14	-0,12200	12	-0,1501	17
	4	Alfred Berg Global Quant NOK	-0,2291	20	-0,35383	22	-0,1065	13
	5	Fondsfinans Global Helse	0,0546	3	0,05982	2	0,0482	4
	6	Eika Global	-0,1429	16	-0,08160	10	-0,2205	19
	7	DNB Global (IV)	-0,0298	6	0,03230	6	-0,0823	10
	8	Nordea Stabile Aksjer Global Etisk	0,0952	2	0,05461	3	0,1563	2
	9	PLUSS Utland Etisk	-0,1651	19	-0,23186	19	-0,0702	8
	10	Storebrand Aksjespar	-0,1181	12	-0,11013	11	-0,1290	14
	11	Storebrand Global Verdi	0,2302	1	0,23944	1	0,2202	1
Conventional funds	1	C Worldwide Globale Aksjer	-0,0491	7	-0,12648	14	0,0317	5
	2	Holberg Global A	-0,0530	8	-0,12221	13	0,0256	6
	3	Pareto Global A	-0,0968	11	-0,01076	8	-0,1683	18
	4	Landkreditt Aksje Global	-0,1625	18	-0,20990	17	-0,1384	16
	5	C WorldWide Medical	-0,0547	9	0,05455	4	-0,1312	15
	6	Danske Invest Investeringsprofil Aksjer	-0,2328	21	-0,23877	20	-0,2327	21
	7	SKAGEN Global A NOK	-0,1302	15	-0,04697	9	-0,2299	20
	8	SKAGEN Vekst A NOK	-0,1229	13	-0,14023	15	-0,1015	12
	9	Vekterfond Aksjer I	-0,2696	22	-0,27242	21	-0,2748	22
	10	FRAM Global	-0,1486	17	-0,22120	18	-0,0710	9
	11	Danske Invest Horisont Aksje	0,0270	4	0,01451	7	0,0552	3

MODIFIED INFORMATION RATIO

	Pair		2010-2017	RANK	2010-2013	RANK	2014-2017	RANK
SRI funds	1	C WorldWide Globale Aksjer Etisk	-0,00002	11	-0,00004	13	0,02008	7
	2	Delphi Global	0,00000	5	0,04177	5	-0,00002	12
	3	DNB Aktiv 100	-0,00004	20	-0,00006	19	-0,00002	13
	4	Alfred Berg Global Quant NOK	-0,00003	13	-0,00004	14	-0,00001	8
	5	Fondsfinans Global Helse	0,05460	3	0,05982	2	0,04822	4
	6	Eika Global	-0,00003	14	-0,00002	10	-0,00003	15
	7	DNB Global (IV)	0,00000	6	0,03230	6	-0,00001	9
	8	Nordea Stabile Aksjer Global Etisk	0,09517	2	0,05461	3	0,15627	2
	9	PLUSS Utland Etisk	-0,00003	16	-0,00007	20	-0,00001	10
	10	Storebrand Aksjespar	-0,00004	17	-0,00004	15	-0,00003	17
	11	Storebrand Global Verdi	0,23023	1	0,23945	1	0,22017	1
Conventional funds	1	C Worldwide Globale Aksjer	-0,00001	7	-0,00003	12	0,03166	5
	2	Holberg Global A	-0,00002	12	-0,00005	16	0,02557	6
	3	Pareto Global A	-0,00003	15	0,00000	8	-0,00006	21
	4	Landkreditt Aksje Global	-0,00001	8	-0,00001	9	-0,00001	11
	5	C WorldWide Medical	-0,00002	10	0,05455	4	-0,00006	22
	6	Danske Invest Investeringsprofil Aksjer	-0,00004	18	-0,00005	17	-0,00002	14
	7	SKAGEN Global A NOK	-0,00004	21	-0,00002	11	-0,00006	20
	8	SKAGEN Vekst A NOK	-0,00008	22	-0,00012	21	-0,00005	18
	9	Vekterfond Aksjer I	-0,00004	19	-0,00006	18	-0,00003	16
	10	FRAM Global	-0,00001	9	-0,00019	22	-0,00005	19
	11	Danske Invest Horisont Aksje	0,02698	4	0,01451	7	0,05521	3

The above tables represent the results from each of the six measurements; the numbers marked in green are the top three rankings, while the ones marked in red are the bottom three rankings. The results are shown in the left column, and the ranking in the right column (where the highest values are ranked from highest (1)). Each measurement is estimated over the full sample period (2010-2017), as well as the two sub-periods; 2010-2013 (I) and 2014 – 2017 (II).

Appendix 8: Results; Traditional performance measures (pair level)

SHARPE RATIO	2010-2017	2010-2013	2014-2017		Modified Sharpe Ratio	2010-2017	2010-2013	2014-2017
Pair 1	0	0	0		Pair 1	0	0	0
Pair 2	1	1	0		Pair 2	1	1	0
Pair 3	0	1	1		Pair 3	0	0	1
Pair 4	0	0	0		Pair 4	0	0	0
Pair 5	1	0	1		Pair 5	1	0	1
Pair 6	1	1	0		Pair 6	1	1	0
Pair 7	1	1	1		Pair 7	1	1	1
Pair 8	1	0	1		Pair 8	1	1	1
Pair 9	1	1	1		Pair 9	1	0	1
Pair 10	1	1	1		Pair 10	1	1	1
Pair 11	1	0	1		Pair 11	1	1	1
Total	8	6	7		Total	8	6	7

TREYNOR INDEX	2010-2017	2010-2013	2014-2017		M&M	2010-2017	2010-2013	2014-2017
Pair 1	0	0	0		Pair 1	0	0	0
Pair 2	1	1	0		Pair 2	1	1	0
Pair 3	0	0	1		Pair 3	0	1	1
Pair 4	0	0	0		Pair 4	0	0	0
Pair 5	1	0	1		Pair 5	1	0	1
Pair 6	1	1	0		Pair 6	1	1	0
Pair 7	1	1	1		Pair 7	1	1	1
Pair 8	1	0	1		Pair 8	1	0	1
Pair 9	1	1	1		Pair 9	1	1	1
Pair 10	1	1	0		Pair 10	1	1	1
Pair 11	1	1	1		Pair 11	1	0	1
Total	8	6	6		Total	8	6	7

INFORMATION RATIO	2010-2017	2010-2013	2014-2017		MODIFIED INFORMATON	2010-2017	2010-2013	2014-2017
Pair 1	0	0	0		Pair 1	0	0	0
Pair 2	1	1	0		Pair 2	1	1	0
Pair 3	0	0	1		Pair 3	0	0	1
Pair 4	0	0	1		Pair 4	0	0	0
Pair 5	1	1	1		Pair 5	1	1	1
Pair 6	1	1	1		Pair 6	1	1	0
Pair 7	1	1	1		Pair 7	1	1	1
Pair 8	1	1	1		Pair 8	1	1	1
Pair 9	1	1	1		Pair 9	1	0	1
Pair 10	1	1	0		Pair 10	0	1	1
Pair 11	1	1	1		Pair 11	1	1	1
Total	8	8	8		Total	7	7	7

Where: 1 means the SRI fund performed better than its conventional peer. The results are presented at pair level from pair 1-11, as well as a total measurement for each specific performance measure.