



LUT School of Business and Management

Bachelor's Thesis in Economics

Financial Management

**Performance of socially responsible mutual funds in United States
during 2008-2018**

**Vastuullisten sijoitusrahastojen suoriutuminen Yhdysvalloissa
vuosina 2008-2018**

11.3.2020

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TIIVISTELMÄ

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Tutkielman nimi:	Vastuullisten sijoitusrahastojen suoriutuminen Yhdysvalloissa vuosina 2008-2018
Akateeminen yksikkö:	LUT-kauppakorkeakoulu
Koulutusohjelma:	Kauppatieteet, Talusjohtaminen
Ohjaaja:	Roman Teplov
Hakusanat:	Vastuullinen sijoittaminen, SRI, S&P 500, tuotto, riski

Tämän tutkielman tavoitteena on tutkia sosiaalisesti vastuullista sijoittamista (SRI) ja sitä, kuinka Yhdysvalloissa markkinoidut vastuulliset rahastot ovat suoriutuneet vuosina 2008-2018.

Tutkimuksessa tarkastellaan kuuden eri Yhdysvaltalaisen sosiaalisesti vastuullisen rahaston suorituskykyä. Nämä rahastot ottavat huomioon sijoituspäätöksissään ympäristöön, sosiaaliseen vastuuseen ja hyvään hallintotapaan liittyvät tekijät. Vertailuindeksinä tutkimuksessa käytetään S&P 500 -indeksiä. SRI-rahastojen tuotto vertailuindeksiin verrattuna arvioidaan keskimääräisen tuoton perusteella. Rahastojen tuottoa arvioidaan myös kolmella riskisopeutetulla menestysmittauksella: Sharpen luvulla, Treynorin luvulla ja Jensenin alfalla.

Tutkimuksen tulokset osoittavat, että vuosina 2008-2018 valitut vastuulliset sijoitusrahastot Yhdysvaltain markkinoilla ovat tuottaneet heikommin kuin S&P 500 -indeksi.

ABSTRACT

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Title: Performance of socially responsible mutual funds in United States during 2008-2018
School: School of Business and Management
Degree programme: Business Administration / Financial Management
Supervisor: Roman Teplov
Keywords: Socially Responsible Investing, SRI, S&P 500 profit, risk

The goal of this bachelor's thesis is to investigate socially responsible investing (SRI) and how responsible funds marketed in United States have performed in 2008-2018.

The study reviews the performance of six different U.S based SRI funds. These funds take in to account the environment, social responsibility and good corporate governance. The benchmark index used in the study is S&P 500 index. The performance of the SRI funds compared to the benchmark index is evaluated based on the average returns. The performance of the funds is also evaluated by three risk-adjusted success measures: the Sharpe number, the Treynor number, and the Jensen alpha.

The results of the study show that during 2008-2018 the chosen responsible mutual funds in the on the market of United states have performed weaker than S&P 500 index.

Table of contents

1. Introduction.....	1
1.1 Research Objectives	2
1.2 Limitations of the Study and theoretical framework.....	3
1.3 Structure of the thesis	4
2. Socially responsible investing.....	5
2.1 Socially responsible investing strategies	6
2.2 History of socially responsible investing	7
3. Theoretical framework	8
3.1 Portfolio Theory and socially responsible investing.....	8
3.2 Previous research done on the subject	10
4. Research data and methods.....	13
4.1 Selected funds.....	13
4.2 S&P 500 Index and risk-free return	16
4.3 Research methods	18
4.3.1 Sharpe ratio	19
4.3.2 Treynor ratio	19
4.3.3 Jensen's alpha.....	20
4.3.4 Beta	20
4.3.5 Volatility	21
5. Research results.....	22
5.1 Performance in 2008-2018.....	22
6. Summary and conclusions.....	26
References	29

1. Introduction

Climate change and its effects are talked about all over the world and how we humans should act to slow down the deterioration of our planet. In the middle of all this the biggest consumers of the environment are businesses and their practices. Business risks caused by climate change have been on the headlines a lot lately and companies are required to be more transparent on the environmental questions. Business number one priority is usually cost minimization and profit maximization and the stockholders want the maximum value for their holding. At the same time the interest in socially responsible investing and talking about targeting cash flows towards more sustainable business practices has grown. Many financial institutions have noticed this shift toward responsible thinking and are offering different financial instruments to support this movement.

Socially responsible investing (SRI) is an investment strategy that considers environmental, social and corporate governance (ESG) criteria to generate long-term competitive financial returns and positive societal impact (US SIF, 2019). Socially responsible investing is defined as a set of investment-related strategies (portfolio screening, shareholder advocacy, and community investing) aimed at identifying and setting standards for corporate social and environmental performance and leveraging changes in company behavior and impact (Gay and Klaasen, 2005)

According to De Collen & York socially responsible investing has two main purposes. When investor invests according to the SRI principles, investor may take into account his/her own ethical values. On the other hand, it also encourages companies to pay more attention to questions concerning social responsibility and sustainable development. (de Colle & York 2009)

In 1995 the total amount of money invested in SRI funds in the USA was around 12 billion dollars. In the 2018 the amount had increased to 12 trillion dollars. During the same time period the total amount of SRI funds in USA grew from 55 to 780. (US SIF, 2019)

The current research hasn't obtained unambiguous answer whether the SRI funds perform better or worse than the more traditional funds. A study by Barnett & Salomon (2006) suggests that the funds positive or negative performance depends mostly on what environmental, social and corporate governance factors have been weighted out when choosing the investment.

1.1 Research Objectives

The Objective of this study is to find out how responsible funds marketed in United states have performed in period of 2008-2018. The goal is to make a clear picture of what socially responsible investing is and can it be an effective investing strategy. This study's goal is to provide detailed information for those interested in responsible investing.

The main research question is:

"Can socially responsible investing be an effective investing strategy?"

The main research question is specified with following sub questions:

"Have the socially responsible funds performed better than the S&P 500 index in the period of 2008 to 2018"

"From an investor's perspective, can socially responsible investing be a viable strategy?"

The goal of the sub questions is to provide a more accurate answers on how SRI funds have performed compared to the benchmark index. The goal is to find out if SRI funds have performed better than the benchmark index during 2008-2018. We also want to find out what are the reasons why people choose to invest corresponding to the SRI Criteria.

1.2 Limitations of the Study and theoretical framework

The research is limited to eight responsible funds marketed in the United States. The funds have been selected as widely as possible from the selection of MFIs operating in United States. All selected funds invest assets in equities worldwide, taking into account responsibility, sustainable development and ESG-criteria in their investment decision. The benchmark index is S&P 500 index, that measures the performance of 500 large stocks listed on stock exchanges in the U.S It is one of the most followed equity indices in the whole world. Many people consider S&P 500 index to be one of the best representations of the whole United States stock market. The average annual total return of the index includes dividends. (Investopedia 2019) The study is limited from the beginning of 2008 to the end of 2018 and this period is divided into up and down markets according to market conditions.

The theoretical framework of this study is formed by first introducing the concept of responsible investment then it goes through portfolio theory and lastly it goes through previous research done of the subject. In addition, this study presents the key points of responsible investment portfolio theory. The study focuses particularly on the contradiction that is between responsible investing and portfolio theory. Understanding these concepts is important in order to understand this research.

This study also goes through success metrics, which are the Sharpe ratio, the Treynor ratio, and the Jensen's alpha. The preview of previous studies gives an indication of the results for this study.

1.3 Structure of the thesis

After the introduction, the thesis proceeds to the literature review and in depth look of theories. At first it goes through the concept of responsible investing then it goes through the strategies related to SRI and lastly it will take a look at the history of responsible investing in the United States. After this it will take a closer look at portfolio theory, as well as reviewing previous research on responsible investing. The fourth paragraph introduces the material used in the thesis and it also goes through the different research methods. After this, we move on to empirical data analysis and interpretation of the research results. The last paragraph summarizes the study results, answers research questions and compares the results with previous studies. The summary also provides suggestions for further research.

2. Socially responsible investing

Socially responsible investing means an investment process that takes in to account environmental, social and governance factors, or shortly ESG factors. Based on these factors, investors filter out investment targets so they can create a responsible investment portfolio (Henske 2016). Considering ESG factors when making investment decisions is important because previously done unethical investment decisions have led to today's crisis, according to some researchers. One of the recent examples is the financial crisis of 2008-2009 which had an enormous impact on the financial markets, international financial practices and society. Responsible Investment is seen as a bridge between the financial world and society. Many people think that Responsible investment decisions are the solution to today's crises and how to avoid them in the future. (Bilbao-Terol et al. 2016)

The idea behind responsible investment is that the investment decisions take into account both economic and non-economic aspects. As opposed to traditional investing, in SRI the non-economic aspects, such as the environment, social responsibility, and moral concerns are in the center of the decision making (Benson, Brailsford & Humphrey 2006). SRI is described as taking into account the personal values and social concerns when making investment decisions by Berry & Junkus (2013). Schueth (2003) describes SRI as strategy that allows the investor to take into account personal values, financial goals, while still achieving competitive returns.

Socially responsible investing can be portrayed in the model of three P's: "people, planet and profit" (Forte & Miglietta 2007). Investors make decisions based on their own values and attitudes and they choose the mutual funds and companies based on these values. Many investors focus solely on the things they want to avoid investing in such as tobacco products, alcohol or weapons. Other investors focus on the social issues they want to support such as animal rights or feminism. But lately the biggest concern has focused on the environmental issues. (Schwartz 2003) The most typical strategies to support responsible investing are reviewed next in this chapter.

2.1 Socially responsible investing strategies

There are several strategies for responsible investing that can be used either individually, or by applying multiple strategies in parallel. The three most common strategies are following: screening, shareholder advocacy and community investing. These strategies are described as the most popular ones by both Schueth (2003) and de Collen & York. These most common strategies are introduced briefly below.

Screening is the practice of including or excluding companies from portfolio based on the ESG criteria. In general, the investors try to find companies that are profitable but at the same time make positive impact to the society. Investors require the portfolio managers to make a thought-out analysis of the corporate policies, practices, attitudes and impacts. But also, traditional quantitative analysis of profit potential should be done. When both factors are included in the analyzing process it usually results in portfolios that have enterprises with excellent relationships between the employer and employees. These companies usually are also environmentally friendlier than most of the companies. Corporations that produce safe, useful and sustainable products are chosen in the portfolio, and companies whose products and business practices are harmful to the society are left out. (Schueth 2003)

Shareholder advocacy includes participating in discussion with decision-making body of the company and the practices that are against the ESG criteria are tried to be eliminated. These efforts usually positively impact the businesses behavior. Social investors often work together to steer the company's administration on a path that is sustainable and environmentally friendly. Also practices that are fair to the stakeholders such as the workers, retailers and the clients. This should in the long run improve the company's financial performance and bring in bigger profits to the stock holders. (Schueth 2003)

The goal of a community investing is to help the more disadvantaged people and bring in money to the poorer communities. This can be done by donating a portion of the investment to institutions that help to develop these communities. The money helps in building low income and cheaper housing in the area and it also channels the money to small businesses in the community. (Schueth 2003)

2.2 History of socially responsible investing

The earliest signs of the socially responsible movement can be found in the bible. Some of the basics of Socially responsibility can be found in the Jewish law. In the mid-1700s, the founder of Methodism, John Wesley, noted that the responsible use of currency was one of the most important subject of New Testament teachings. So, for long the SRI was based on religion. This trend can still be seen in the United States by the widespread avoidance of stocks that are found to be sinful. These companies include alcohol, tobacco and gambling industries (Schueth 2003)

Modern foundations of social investing can be traced to the 1960s. During that time the most talked about subject were such as: Vietnam war, cold war and women's rights. The amount of socially responsible investors grew significantly through the 1980s as the people learned about the disasters such as: Bhopal, Chernobyl and Exxon Valdez. Also new evidence found about climate change came to the attention of the general public and the investors started to consider the effects of their investment to the environment. Most recent issues such as school shooting, human rights and good working conditions in factories that are in the developing countries such as China have also started to be considered in the 2000s (Schueth 2003)

3. Theoretical framework

This chapter looks at responsible investment from the perspective of modern portfolio theory, and it also goes through the previous research done of the subject. The chapter on portfolio theory and responsible investing addresses the contradiction between financial theory and investment strategy. The chapter of previous studies focuses on research done about responsible investment portfolios performance and the reasons for their positive or negative returns.

With the growing popularity of socially responsible investing, the investment strategies correlation to economic performance has been studied a lot. Individual studies have found both positive and negative relationships between responsible investing and financial performance, so there is no explicit answer for SRI strategies better or worse performance. (Hickman, Teets & Kohls 1999)

3.1 Portfolio Theory and socially responsible investing

Markowitz (1952) is the developer of the modern portfolio theory. The purpose of portfolio theory is to spread the risk while maximizing the returns. Portfolio theory assumes that in order to get bigger return the risk must increase. Another assumption is that the investors want to avoid risk. Based on the principles of portfolio theory, it is important to diversify the portfolio. The portfolio can be diversified by investing in different investment objects that don't correlate too much with each other. The advantage of diversification is the reduction of risk in the investment portfolio. (Markowitz 1952)

The impact of having responsible investments in the investment portfolio has been studied to some extent. A research done by Hickman, Teets and Kohls (1999) studied socially responsible investing and its effects based on the modern portfolio theory.

They examined if the benefits of decentralization increased when responsible companies were added to the investment portfolio. Through their research, they found that decentralization was not at best rate if the portfolio consists solely of responsible mutual funds. They found out that diversification is at its best when also regular funds were added to the investment portfolio along the socially responsible ones.

Portfolio with broadly diversified investments, is only exposed to unavoidable market risk. In case of the responsible investments it is often used to avoid, favor, integrate, or influence strategies. Therefore in practice the addition of extra constraints to the portfolio prevents the formation of an optimal portfolio. When limiting the investment portfolio, the investor is denying himself the benefits of diversification, as manifested by the risk-weighted loss of revenue. In addition, additional costs will be incurred by those responsible factors that can lead to under-performance of responsible funds. (Cortez et al. 2009)

Kurtz (2005) says that the critique towards socially responsible investing is often linked to the fact that according to modern portfolio theory, limiting the investment universe for any reason leads to a suboptimal portfolio. If the investor focuses only on the small and carefully categorized group of equities, SRI strategy may have negative impact on the portfolio. For those who strongly believe in modern portfolio theory, these costs are usually not worth it (Kurtz 2005). As stated earlier, responsible investment strategies often use screening as a strategy that borders many companies automatically away from the field of investments. This kind of act that excludes some stocks and favors some leads from the perspective to a suboptimal portfolio that always loses for the market portfolio according to the principles of Markowitz's (1952) portfolio theory. According to Renneboog et al. (2008b) portfolios consisting only of socially responsible investments is expected to perform poorly for two reasons. Firstly, responsible funds limit out of its reach financially very attractive investments that do not promote the fund's sustainability objectives. These include alcohol, tobacco and gambling industries. Second, harsh screening reduces the investment universe, which in turn

may lead to a weaker financial performance of funds' performance because the lack of decentralization. (Renneboog et al. 2008b)

Barnett and Salomon (2006) emphasize the fact that according to the modern portfolio theory costs are incurred by limiting the investment, but it does not take in considering the benefits of investing responsibly. It's also good to note the theory does not take into account what the stock values of different companies are based on. Effective markets assume that each share is treated the same except in view of their volatility in relation to market volatility. Responsible investing advocates believe that responsible investments are better than others in the market and therefore likely to do better return over time.

3.2 Previous research done on the subject

Previous research results vary, so there is no consensus on the profitability of socially responsible investment strategy. Some studies state socially responsible portfolios produce excess returns over traditional investments, while some studies end up with lower returns on SRI portfolios or as large as regular portfolios.

Hamilton, Jo and Statman (1993) identified three hypotheses about the success of socially responsible and traditional funds. They stated that the risk-adjusted return on socially responsible portfolios and traditional portfolios is the same. Guerard (1997) states that socially responsible companies lose nothing by operating according to the ESG-factors because the cost of capital is usually the same as traditional businesses.

In 2007 Kempf and Osthoff investigate whether an investor can generate excess returns by investing in responsible investments. In their research they formed a variety of responsible investment portfolios based on different criteria. For example, they ranked the companies based on the ESG-criteria. The study found that so called. best-

in-class method worked the best. This method works by choosing the companies that are most responsible from various industries. In this way the best returns were achieved in the period under investigation. By this method the investment portfolio formed achieved an annual surplus of up to 8.7%. According to researchers with the best-in-class method, the investment portfolio achieves the best return when the investor uses several different types of responsible investment strategies to build a portfolio. (Kempf & Osthoff 2007)

The research done by Kempf & Osthoff 2007 built a frame for later research done by Dravenstott & Chieffe (2011). They formed different portfolios A, B and C based on their sustainability. A portfolio consisted of non-sustainable companies, B had both sustainable and non-sustainable companies and C had only sustainable companies. When they investigate the performance of responsible and non-responsible portfolios, responsible portfolios performed worse than non-responsible. According to the research, the difference is due to the methods and criteria used when selecting the investment targets. The study found out that portfolios containing only responsible investments portfolios performed poorly, which led to a conclusion that the company's responsibility should not be the only factor to consider when creating an investment portfolio, but investment decisions should be also based on non-responsible factors. However, the study found out that: even if responsible portfolios appear to be performing poorly, this does not necessarily mean, that a responsible strategy will always result in lower returns for the investor, because of the research portfolio allocation was done in a way that few portfolio managers would use when making investment choices. (Dravenstott & Chieffe 2011)

Von Wallis and Klein (2015) found that in 14 studies, SRI portfolios were outperforming the reference portfolio, 15 performed equally well and in six studies The SRI portfolio was underperforming compared to the reference portfolio. Research on Socially Responsible Investment results are inconclusive, so von Wallis and Klein (2015) state that more conceptual and theoretical work would be needed before comparing SRI portfolios success compared to the regular portfolios. Thus, firstly it should be defined

when the fund is regarded as socially responsible. One possible solution would be to introduce a valuation method to classify funds social responsibility. According to Wimmer (2012), corporate ESG ratings is the best way to measures the social responsibility of the fund.

A lot of research has been done on the subject, but it is still not possible to say with certainty that socially responsible companies would do better or worse than other companies or the index.

4. Research data and methods

This chapter goes through the funds used in the study, the risk-free return and the S&P 500 index. In addition, the research goes through different market situations and they are divided into periods of rising and falling. Six different socially responsible funds were selected for the study. Empirical testing was performed using logarithmic weekly returns. The value quotes of the funds selected for the study and the benchmark index were applied for DataStream for the years 2008-2018. The values of the funds used in the study are dividend-adjusted

4.1 Selected funds

United States has long roots on the field of socially responsible investing, so finding funds that are established on or before the year 2008 is relatively easy. Table 1 has a list of the funds selected for the study. There were total of 6 funds chosen for the study. All funds selected for the study invest their assets back to the fund, so the results are comparable. In the table you can see the name of the fund, the date when the fund was founded, the expense ratio that is the yearly cost that funds charge their investors. It expresses the costs in percentage for all the fund expenses: including all the fees, operating costs, and all other asset-based costs incurred by the fund. (Morningstar 2019). We can also see the net assets of the fund and the 5-year annualized returns for the stock. We can see that the stock with lower expense ratio tend to do better than the ones with bigger one.

Table 1 Selected funds

Name of the fund	Founded	Expense ratio	Net Assets	5 Yr Annualized Return
Vanguard FTSE Social Index Inv	May 31, 2000	0.18%	\$6.74 B	9.7%
DFA Emerging Markets Social Core Port	Aug 31, 2006	0.53%	\$1.47 B	2.9%
VALIC Company II Socially Responsible	Sep 21, 1998	0.61%	\$751 M	4.8%
AMG GW&K Enhanced Core Bond ESG Z	Dec 19, 1997	0.74%	\$35.4 M	0.0%
Pioneer Classic Balanced Y	Dec 16, 1991	0.84%	\$321 M	0.9%
Pax ESG Beta Quality Individual Investor	Jun 11, 1997	0.90%	\$236 M	3.2%

Vanguard FTSE Social Index Inv is a low-cost fund that invests in large- and mid-capitalization stocks that have been chosen according to the social and corporate governance criteria. In addition to stock market unpredictability, one of the fund's key factors is that its socially conscious approach most likely produces yields that are different from the broad market. (Vanguard 2019)

DFA Emerging Markets Social Core Port fund invests at least 80% of its assets in developing economies equity securities that are based outside of the U.S. It may obtain hold of companies in these markets by purchasing equity securities in the form of depositary receipts, which may be listed or traded outside the issuer's home country. (MutualFunds.com 2019) This fund was chosen to also have a fund that mainly invests outside the U.S to find out how the markets are performing on the emerging marketplaces.

VALIC Company II Socially Responsible invests mainly in equity securities and thought out these tries to obtain growth of the capital. Companies that are chosen to the portfolio meet the social criteria created for this fund. The fund invests, around 80% of its equity to U.S based companies under normal circumstances. To determine which

companies, meet the criteria set by the fund, the Valic Company buys research services from outside provider. (Financial Times 2019)

AMG GW&K Enhanced Core Bond fund pursues to reach its objectives by investing in a spread portfolio of stable income securities. The fund seeks to invest around 80% of its capital to regular bonds. The fund may also invest in asset-backed and mortgage-backed debt securities. At most 20% of the funds assets may be invested in so called junk bonds

Pioneer Classic Balanced Y fund invest according to the funds own ESG criteria to find the targets for its investments. In normal situations, the fund invests around 80% of its net assets (along with the borrowed money, if there is any) in securities of issuers that the investment adviser believes adhere to the fund's ESG criteria. (Amundi Pioneer 2019)

Pax ESG Beta Quality Individual Investor fund invests mainly in large companies that are based in the U.S. These companies must have strong Environmental, Social and Governance (ESG) profiles that exhibit higher "quality" characteristics and realistic valuations. It may invest a small amount of its equity to emerging markets investments and American Depositary Receipts ("ADRs") but may invest no more than 25% of its assets in securities that are outside of the U.S. (Pax World Funds 2019)

4.2 S&P 500 Index and risk-free return

The S&P 500 is a stock market index that measures the performance of the 500 biggest companies listed on different stock exchanges in the United States. It is the most followed index in the United States and most of the people believe it to be one of the best representations of the U.S. stock market as a whole. The average annual return of the S&P 500 index, including dividends, since its launch in 1926 has been 9.8% (U.S. News, 2018). This index was chosen for the study because it represents best the U.S. stock market and its performance. Also, the index takes into account both the price growth and the dividends of the stocks, so it's easier to compare it to the different funds.

In practice there is no such thing as a risk-free investment because even the safest investments carry a very small amount of risk. Thus, the interest rate on a three-month U.S. Treasury bill is often used as the risk-free rate for the markets in the United States. (Investopedia 2019) The Treasury Bill is a short-term U.S. government debt obligation backed by the Treasury Department with a maturity of one year or less, in this case we chose the 3-month Treasury Bill. These securities are widely viewed as low-risk and secure investments. (Investopedia 2019) In the Figure 1 we can see the development of three-month U.S. Treasury bill in the period of 2008-2018. In the graph we can see that after the big market crash of 2008 the rate of the Treasury Bill has been at the rate of 0,1% to 0,3% until the year of 2016 when the price started to go up and it is still going up to this date.

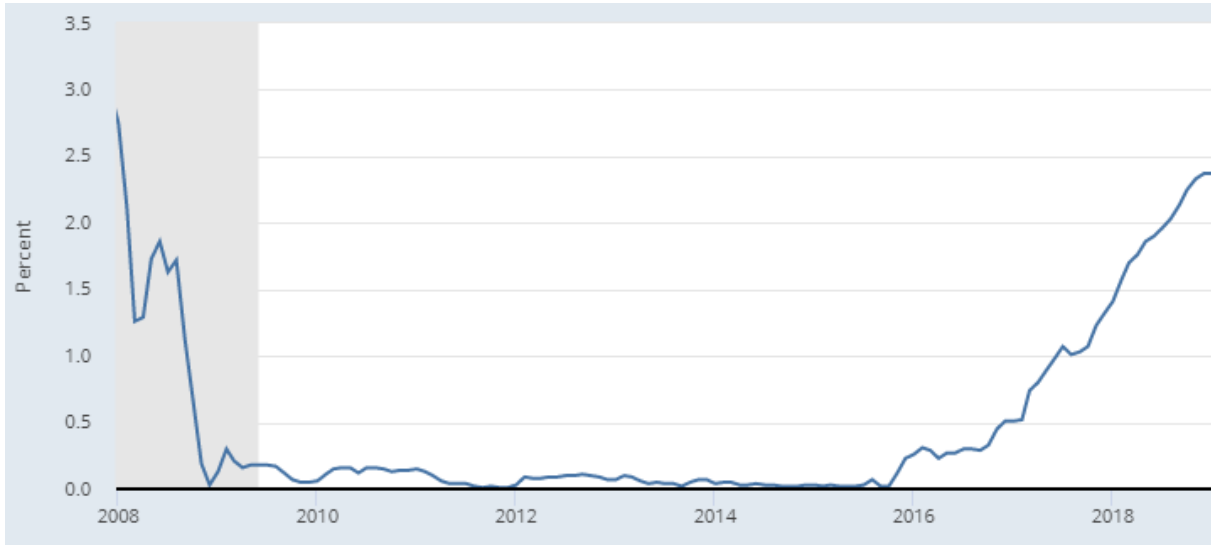


Figure 1 three-month U.S. Treasury bill in the period of 2008-2018

Figure 2 illustrates development of the S&P 500 index that is used as the benchmark index from the beginning of 2008 to the end of 2018. The rising market is defined as the time period when the market index price volatility has been at least 20%.

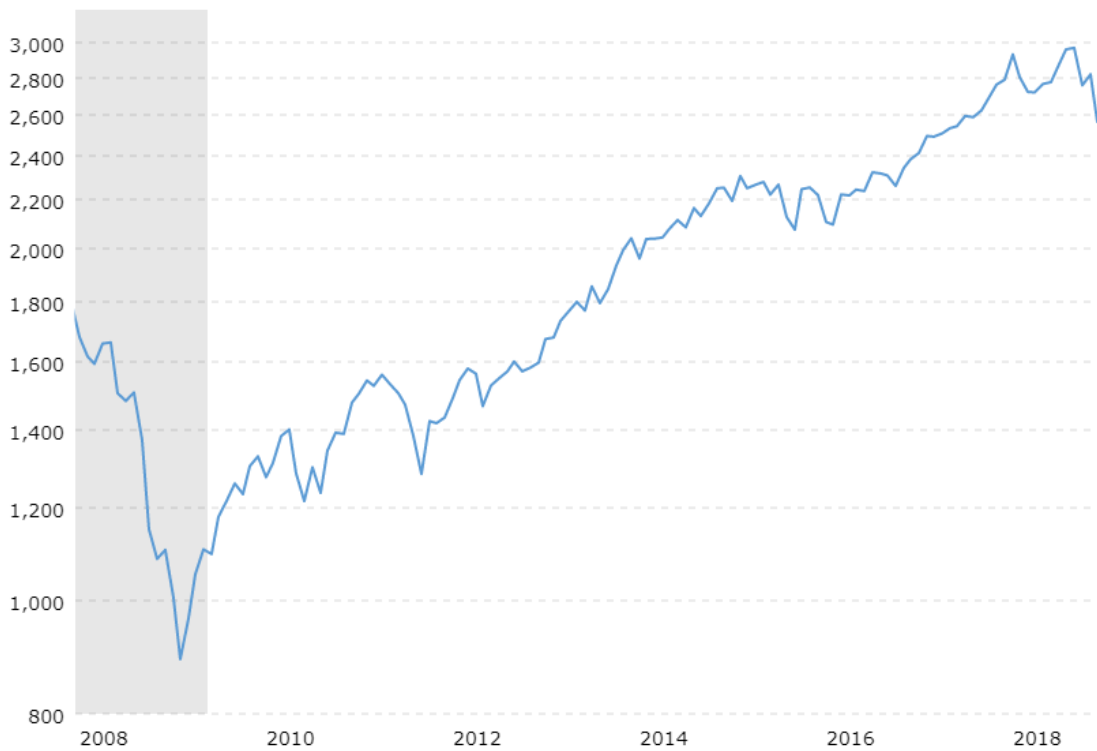


Figure 2 S&P 500 Index Performance from the beginning of 2008 to the end of 2018

4.3 Research methods

The study measures the risk-adjusted success of funds with three well known risk-adjusted success measures. The success indicators selected are Sharpe's ratio (Sharpe, 1966), Treynor's ratio (Treynor, 1966) and Jensen's Alpha (Jensen 1968).

To find out the yields of the different funds weekly values taken from DataStream database are used in this research. Index yields were calculated from yield indices, which take into account both dividends and price changes. When calculating the yields for the funds and the benchmark index logarithmic return or continuously compounded return is used. When the income is calculated as logarithmic, the data obtained follows more normal distribution, which is more useful in statistical research than what it would be in normal form. To find out the logarithmic yield for the funds and the benchmark index the following formula is used (1):

$$r_t = \ln\left(\frac{P_t}{P_{t-1}}\right) \quad (1)$$

r_t = logarithmic return

P_t = Price at the time of t

P_{t-1} = Price at the time of t - 1

Because weekly values are used to calculate the logarithmic returns, the returns will be converted to annual returns by multiplying logarithmic returns by 52. Also the weekly volatility is converted to yearly volatility by multiplying the value by the square root of 52. Volatility is the up-and-down change in the price or value of a financial instrument during a given period of time. (Ally.com 2019)

4.3.1 Sharpe ratio

The Sharpe ratio is a commonly used portfolio success indicator based on a formula made by William Sharpe in 1966. The Sharpe figure is calculated by dividing the excess of the risk-free rate by standard deviation of returns. It compares portfolios over-yield to its volatility. Higher Sharpe number value tells that the fund is performing well compared to its risk. Between portfolios in comparison, the portfolio with the highest Sharpe number has performed best during the review period. (Sharpe, Alexander, Bailey, 1999, 844-846) The Sharpe Chapter was calculated using formula (2):

$$S_i = \frac{R_i - R_f}{\sigma_i} \quad (2)$$

S_i = Sharpe ratio for the portfolio i

R_i = The yield of the portfolio i

R_f = Risk free yield

σ_i = Volatility of the portfolio i

4.3.2 Treynor ratio

Treynor ratio can be calculated by dividing the excess of the risk-free return by the beta, or systematic risk. The difference between Sharpe's and Treynor's ratio is that The Sharpe figure compares portfolio overperformance with total portfolio risk while The Treynor figure compares portfolio overperformance with market risk. (Sharpe, Alexander, Bailey, 1999, 844) Treynor's ratio were calculated using the formula (3):

$$T_i = \frac{R_i - R_f}{\beta_i} \quad (3)$$

T_i = Treynor ratio for the portfolio i

R_i = Yield of the portfolio i

R_f = Risk free yield

β_i = Beta of the portfolio i

4.3.3 Jensen's alpha

Jensen's alpha is a risk-adjusted performance measure that represents the average return on a portfolio or investment, above or below that predicted by the capital asset pricing model (CAPM), given the portfolio's or investment's beta and the median market return. This metric is also commonly referred to as simply alpha. (Investopedia 2019)

$$\alpha_i = R_i - [R_f + \beta_i (R_m - R_f)] \quad (4)$$

α_i = Alpha of the portfolio i

R_i = Yield of the portfolio i

R_f = Risk free yield

R_m = Market yield

β_i = Beta of the portfolio i

4.3.4 Beta

The beta of the portfolio reflects the market risk of the portfolio. The beta is obtained by calculating the portfolios yields and market portfolios yields covariance and dividing it by the portfolio variance in earnings. The formula for beta is shown in formula (5)

$$\beta = \frac{\text{Cov}(r_i, r_m)}{\text{Var}(r_m)} \quad (5)$$

β = portfolio i beta-value

r_i = portfolio i yield

r_m = market portfolios yield

$\text{Cov}(r_i, r_m)$ = r_i and r_m yields covariance

$\text{Var}(r_m)$ = market portfolios variance

4.3.5 Volatility

Volatility (symbol σ) is the degree of variation of a trading price series over time as measured by the standard deviation of logarithmic returns.. The formula for volatility is shown in formula (6)

$$\sigma = \sqrt{\frac{\sum_{i=1}^n (r_i - m)^2}{n-1}} \quad (6)$$

σ = volatility

r_i = portfolio i yield

m = average return

n = number of observations

5. Research results

This chapter goes through the findings of the study. First, we will take a look at the performance of selected responsible funds during the period by taking a closer look at the yearly yield and volatility. After this we will review the performance of the funds through the success indicators selected for the study. Finally, we will try to find out whether investing in responsible funds could outperform the market returns.

5.1 Performance in 2008-2018

To find out more about the performance of the funds the average annual returns, volatilities, Jensen's alpha, and Sharpe's and Treynor's were calculated. Table 2 describes the funds average annual returns and volatilities, Sharpe and Treynor figures are shown in the Table 3, and in the Table 4 we can see beta and alpha values

Table 2 Annualized return for the period, Adjusted Return during 2008-2018 and volatility

Name of the fund	Annualized return for the period	Adjusted Return during 2008-2018	Volatility
Vanguard FTSE Social Index Inv	5,78%	75,40%	12.96%
DFA Emerging Markets Social Core Port	0,61%	6,32%	17.32%
VALIC Company II Socially Responsible	4,11%	49,68%	12.57%
AMG GW&K Enhanced Core Bond ESG Z	4,40%	53,7%	3.94%
Pioneer Balanced ESG Y	5,84%	76,48%	8.30%
Pax ESG Beta Quality Individual Investor	3,25%	37,66%	13.32%
S&P 500	6,01%	79,36%	12.42%

As we can see from the table none of the funds was able to outperform the S&P 500 index. Best out of all the funds preformed the Pioneer Classic Balanced ESG. It had average returns of 5,84%. Comparing that to the S&P 500 index it didn't fall that much behind. The biggest reason why the funds were all falling behind the benchmark index is because in the comparison we took in to account the expense ratio, which eats capital out of the investment every year. If we didn't take in to account the year 2008, all of the funds would perform much better, but they still wouldn't be able to beat the S&P 500 index. The SRI funds can still be a profitable investment.

When we look at the volatility, most of the funds fall in to the 12 to 14 categories. The fund that performed the best also had the smallest volatility compared to the others. Still AMG GW&K Enhanced Core Bond ESG Z had the smaller volatility of 3,94% but it still had pretty low returns It seems like big volatility might correlate with smaller yields. The riskiest fund according to its volatility was DFA Emerging Markets Social Core Port fund with volatility value of 17.32 and it performed also poorly.

Table 3 alphas and betas for the funds

Name of the fund	Alpha	R ²	Beta
Vanguard FTSE Social Index Inv	0.45	97.72	1.03
DFA Emerging Markets Social Core Port	-1.08	82.33	1.08
VALIC Company II Socially Responsible	-0.14	99.27	1.01
AMG GW&K Enhanced Core Bond Z	1.22	39.23	0.84
Pioneer Balanced ESG Y	0.92	93.15	1.04
Pax ESG Beta Quality Individual Investor	-1.39	93.95	1.04
S&P 500			1

In the table 3 we can see the Alphas and Betas for the companies. We can also see the R² values for the funds. All of the other funds get a good R² expect the AMG GW&K Enhanced Core Bond Z, so we have to be more critical when analyzing it.

All of the companies get pretty moderate beta values expect AMG GW&K Enhanced Core Bond Z. But as stated earlier this beta can be unreliable. It is interesting to see that all of the funds expect this one is more volatile than the market. Also, the DFA Emerging Markets Social Core Port is most sensitive to market movements when at the same time it had the lowest yield.

The alpha value indicates how much the investment portfolio has over or underperformed, compared to the prediction given to it by the CAP model. Looking at alpha values is good remembers that the Jensen index favors funds with a low beta factor. Like The table can be observed, the fund that got the biggest alpha value has also the smallest beta. But because the AMG GW&K Enhanced Core Bond Z R² value was so small we can't say that this outcome would be reliable.

Table 4 Sharpe and Traynor ratios

Name of the fund	Sharpe
Vanguard FTSE Social Index Inv	1.06
DFA Emerging Markets Social Core Port	0.26
VALIC Company II Socially Responsible	1.02
AMG GW&K Enhanced Core Bond Z	0.95
Pioneer Balanced ESG Y	1.00
Pax ESG Beta Quality Individual Investor	0.90
S&P 500	1.03

When looking at the Sharpe ratios of the different funds we can see that the companies that performed the best had the biggest Sharpe ratios. The Vanguard FTSE Social Index Inv had the biggest Sharpe value of 1.06 and it performed the second best according to its average yield. Also, the smallest Sharpe value of 0.26 went to the worst performer DFA Emerging Markets Social Core Port.

6. Summary and conclusions

The aim of this bachelor's thesis was to find out how the SRI funds marketed in United states performance from the beginning of 2008 to the end of 2018. The research funds were chosen from the selection of responsible funds marketed in United states from widest possible range of financial institutions. The fund choices were based on their starting year, and the fact that the funds had to invest mainly in stocks in order for the results to be as comparable as possible. The funds selected for the research invested mainly in the U.S market, which is why the benchmark index was chosen to be the S&P 500 Index. The performance of the funds was examined over the whole period under review as annual returns, volatility, as well as selected performance measures. the performance indicators for the study were the Sharpe ratio and the Jensen's alpha.

There is no clear consensus based on previous research findings about the effectiveness of responsible investing or what kind of responsible investment strategies are the most effective. Renneboog et al. (2008) studies suggest that in the long run, when comparing responsible and traditional funds there should be no statistically significant difference in the risk-adjusted return. On the other hand, for example, Statman & Glushkov (1993) found that responsible investing can make the best returns when using best-in-class-method or positive screening. Based on a survey results, it appears that that the costs of responsibility can be explained by the benefits that the investor gets from it.

Previous research has drawn attention to various responsible investment strategies and whether a particular strategy automatically leads to better or worse portfolio performance. No unanimous answer has been received for this question either, but as for example Kempf & Osthoff (2007), Dravenstott & Chieffe (2011) and Barnett & Salomon (2006) found out that the strategy seems to have some importance to the portfolio performance. A rather common finding from previous studies was that Exclusive investment strategy leads to lower returns and. It was also found out in

previous studies that sector-specific selections that exclude or favor some sectors, had a negative impact on portfolio performance.

The aim of the study was to find out how the SRI funds marketed in the USA have performed compared to the S&P 500 index during the years 2008 to 2018. The study shows that on average the SRI funds have performed worse than the benchmark index. None of the funds appeared to have performed better than the benchmark index when looking at the annual returns and success indicators. When we purely focus at the average annual returns of funds it can be said that the investor seems to be suffering some kind of loss in order to be responsible.

The biggest reason for the underwhelming performance of the SRI funds was most likely due to their high expense ratios. Because of the expenses being included in the study it's hard to beat the S&P 500 index in the long run. It doesn't come as a surprise that the stock with the lowest expense ratio (Vanguard FTSE Social Index Inv) had the highest average yield over the 10-year period out of all the funds included in the study.

Socially responsible investing can still be a profitable investing strategy but just not the most profitable option there is out there. Because people who practice socially responsible investing usually have a personal connection to their investments and they want to invest their money in noble causes it might be that the profitability is not the number one priority for the investors. Investors might be willing to give up some of the potential profits in order to follow their own moral principles.

The number of funds involved in the study was only six, so general conclusions can't be drawn from so small sample size. The study has already identified a few potential research topics. Because in the results we can see that a few SRI funds are doing fairly well in all periods, it would be interesting to investigate if this is a result of a successful investment strategy or just due to a pure luck. Further investigating could be done to find out what is the role of different responsible investment strategies to the

performance of the fund and if there is any connection between chosen strategy and profitability. Another interesting research topic could be to find out which ESG factors affect SRI funds performance the most. It would also be interesting to expand on the topic already explored in this study but target different markets and introduce benchmarking such as SRI funds between two different countries. Also, the success of the funds in different market situations could be investigated.

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