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Performance of socially responsible stocks in USA during 2017-2021

Bachelor's thesis
International Business Administration, Finance and accounting

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ABSTRACT

The purpose of this paper is to find out how responsible investment strategies have been successful in the United States during 2017-to 2021. Socially responsible investing has grown significantly throughout the years and has led investors to focus on responsible investing to make a change in today's world. This thesis is based on the collected ESG data, and from that data, the thesis has two different portfolios created. One portfolio has low ESG companies from the NYSE and the other high ESG companies from the same marketplace. This thesis used cumulative return, Treynor number, Jensen alpha, and Sharpe number for the measurements of success.

Keywords: Socially responsible investing (SRI), ESG, CAPM, Sustainablilty

INTRODUCTION

Climate change and climate awareness have been in the headlines all over the world and are going to be the most significant threat that human civilization has faced. Humans consumption has reached a point where we need to find solutions to cut our emissions to keep living on this planet for many decades. Businesses have gotten more attention for their positive impact on responsible investing and finding ways to compensate or eliminate the adverse effects of their businesses. Businesses have a focus on profit maximization and give the stakeholders maximum value for their investment. At the same time, the pressure to make a responsible decision has led many businesses to start focusing on their cash flows to responsible investing and sustainable business practices for a better future on the planet. Countries and businesses are changing their business model to be more sustainable (Milinchuk, 2021). In 2020 sustainable funds reached nearly 51 billion in their new investments. That is nearly double the amount compared to 2019. These investments were specifically aimed at companies that are taking ESG factors into account. This growth isn't most likely going to end since companies have to find solutions to prevent the world from a natural disasters. Investors have a variety of different investing options to aim for positive impact and high returns by socially responsible investing. Nowadays there are approximately 400 different sustainable funds for the investor to choose from. This is a great increase in numbers from the 139 funds there was back in 2015. This illustrates the direction of the trend of SRI as well as the demand for change and the willingness to fight the ongoing climate crisis. (Adamczyk, 2021)

Moskowitz (1972) was the first to suggest that social factors should perhaps be considered in an investment decision. The investing world has come a long way from today, with investors increasingly starting to incorporate socially responsible investing and sustainable assessments into their investment decisions. This strategy is called socially responsible investing (SRI). With the rapid growth in popularity, socially responsible investing has been criticized but has also gotten plenty of positive results based on numerous further introduced studies in this thesis.

It is not easy to conclude whether socially responsible funds or companies outperform or underperform market portfolios or traditional funds because many factors need to be looked into when researching these topics.

This thesis seeks to determine whether it is profitable to invest in responsible stocks between the period of 2017-2021 and how the New York stocks exchange high ESG and low ESG companies have outperformed the S&P 500 index. ESG scores are used to create high and low responsibility portfolios and are used to select companies with the lowest and highest score in the same industry for the reference portfolios. The two main research questions are :

1. How successful has the socially responsible investment strategy been in the New York stock exchange during 2017-2021
2. How have U.S. high and low ESG scoring portfolios performed relative to the S&P 500 index

The marketplace in this study is the New York Stock exchange due to its large size and availability of ESG data overall. The time period is 2017-2021 because responsible investing has grown through the years, making the study more relevant when it's up to date. The socially responsible investing performance is studied with annual and cumulative returns. After that comes the risk-adjusted metrics to measure the risk of the investments. The risk-adjusted metrics used in this study are Jensens Alpha, Treynor ratio, and Sharpes ratio. The source for both, the static ESG data and the time series data for the quantitative research regarding the thesis is Thomson Reuters Datastream. The thesis is divided into three main chapters. The thesis starts with the introduction, which describes the basics of the whole thesis. After that comes the theoretical framework, data and methodology and research results. The last part contains the conclusion of the thesis. The theoretical framework reviews the financial theory and evaluates the portfolio's performance metrics. There are also the theories discussed that explain what socially responsible investing is. Data and methodology is explained overall in the second chapter. That chapter focuses on the research portfolios and what research methods were used in this study. The third chapter is a continuation of the previous chapter, and it presents the results of the empirical study. Lastly, in the thesis is the conclusion which gives an overview of the thesis and concludes the paper. The end of the thesis will have the references used for this study.

2. Theoretical framework

This chapter will examine the previous research findings on responsible investing. The main focus is on the previously done research on socially responsible investing and its success. Also, this chapter consists of financing-related theory in SRI, so the viewer gets a comprehensive understanding of how previous research has been conducted.

2.1 Previously done research

Previous research has varied, and thus, no consensus has been reached on the profitability of socially responsible investment strategies. In some cases, socially responsible portfolios have outperformed conventional investments, while other studies have found that SRI portfolios/funds have lower or as large of return as conventional portfolios. Hamilton, Jo, and Statham (1993) were one of the first studies to conduct research on SRI performance. The first assumption was that risk-adjusted returns in socially responsible portfolios are the same as in traditional portfolios. Since the expected rate of return is equal to the firm's cost of capital, this assumption implies that socially responsible investors will not reduce the relative cost of capital of socially responsible companies by favoring their stocks. The second hypothesis was that socially responsible funds' expected rate of return is lower than that of traditional funds. The third hypothesis is described as " doing good while doing good". This assumes that socially responsible portfolios have higher returns than conventional funds.

Von Wallis and Klein (2015) researched how private and institutional investors act in ethical concerns and financial decisions. In their meta-study, they noticed that in most of the research papers they used, the SRI fund performed almost as equally as the conventional investments. However, they still found SR investment outperforming, and also some studies even found that it has a negative impact on the SR investments. So, they mostly found a positive impact in SRI investments if the company implemented SRI fundamentals to their company. (Wallis, Klein, 2014).

Rooseboog (2008) is one of the most extensive studies conducted on socially responsible funds. It covers more than 400 SRI funds in 17 countries. Local market indices and traditional funds are used as benchmarks in the study. The capital asset pricing model (CAPM) and the Fama French 3 model were used to measure the risk-adjusted returns of the funds that were selected for the study. Additionally, the study used the effect of fund size and screening on fund performance. According to the specific study, all selected European SRI funds underperformed the market. When analyzing the risk-adjusted returns of the SRI funds and the traditional funds, the results were not statistically significantly different, except for a few countries in the research. The study also found that SRI fund screening strategies have an impact on the SRI fund performance. (Rooseboog, 2008)

Kempf and Osthoff researched the effects of investing in socially responsible portfolios since investors have incorporated several different SRI screening methods into their decision-making. This research was conducted in 2007, so it is not the latest, but they found some interesting results. Their research implemented negative screening, positive screening, and best-in-class screening. The results show that the best-in-class screening had the highest alpha of up to 8.9%. They found out that implementing several other SRI screenings with the best-in-class screening leads to good performance in the portfolio and high abnormal returns. These screening methods are described further in this thesis (Kempf, Osthoff, 2007).

Meir Statman studies the performance of socially responsible mutual funds. He studies the Domini Social index and the socially responsible mutual funds and compares it to the S&P 500 index. The Domini Social index consists of 250 S&P 500 companies and 400 stocks overall. There are also 50 non-S&P 500 companies that have socially responsible and about 100 non S&P 500 companies that are. In this study, Statman shows that the Domini Social Index, which consists of socially responsible stocks, did almost as well as the S&P 500 overall during the time period. However, the socially responsible mutual funds performed worse than the S&P 500 and the Domini Social index. (Statman, 2000)

Vesa Puttosen's report discusses socially responsible investments overall. He criticizes the end result since it is a seemingly exact ESG score, which depends on the classifier. The differences between classifiers are partly natural since no single institution defines them. There are many different ways to define a company ESG score, and different metrics used to calculate an ESG score and also different companies who report the ESG data. In his opinion, share prices have risen, and green bond prices have risen because of the popularity of socially responsible investing. This has led to a decline in expected returns. Investing in companies with higher ESG scores is no longer justified due to lower return expectations. It is, in his opinion, up to the investor to decide what responsibilities the company should bear. For example, if they want to focus on climate change, they should focus more on the environmental perimeter and not only on the ESG score. This report shows how difficult and paradoxical it can be to consider responsibility when investing. Responsible investing is not always the right way to tackle climate change since ESG investing does not necessarily lead to the best environmental outcomes (Puttonen, 2021)

2.2. Modern Portfolio theory

In 1952 the portfolio theory was developed for portfolio management and other economic theories, for example, wealth valuation, different assets, investment optimization, and portfolio selection. The theory aims to optimize the portfolio for maximum return with a minimum risk. The overall risk of an investment object is described by the standard deviation of the portfolio returns. However, it cannot be completely eliminated by diversification (Markowitz, 1952). The cornerstone of Markowitz is the efficient frontier, which describes the highest possible return with the lowest possible risk. The diversification benefit is large if the correlation between the return of the securities in the portfolio is negative or weak which means that they move in different directions. Sharpe (1964) extends the modern portfolio theory with the concept of systematic risk and portfolio beta. (Beyhaghi, Hawley, 2012) The Sharpe ratio is explained later in the thesis.

2.2.1 diversification

The overall risk of a stock investment can be divided into systematic risk and unsystematic risk. Diversification can reduce or even eliminate unsystematic risk in a portfolio, that is, firm-specific risk arising from uncertainty associated with a single security's return (Kallunki et al., 2019). Such uncertainty could be, for example, customer bankruptcies, layoffs, or other factors that negatively impact a company's future earnings (Knüpfer & Puttonen, 2018). Systemic risk is the part of total risk that cannot be eliminated through diversification, which is why investors are very interested in it. The causes of systematic risk are general stock market volatility, inflation, and interest rates, and it affects the market more broadly, i.e., more different investments at the same time. (Kallunki et al., 2019; Knüpfer and Puttonen, 2018)

Portfolio diversification is based on the principle of diminishing marginal benefit, i.e. the next stock added to the portfolio creates less diversification benefit than before. The key question is to what extent the portfolio should be diversified. There are often different opinions on this. Statman (1987) suggested in his article that a diversified portfolio should consist of at least 30-40 different stocks, depending on the investor's institutional position. In his article, Statman also addresses the reasons why investors are not sufficiently diversifying their portfolios, listing ignorance as one of the possible reasons. Financial expert and CNBC News anchor Jim Cramer (2019) takes a different stance, as he emphasizes the importance of information and knowledge in choosing stocks when building a portfolio. If the investor can well explain why the stocks in question are in the portfolio, then 5-10 stocks are sufficient for the size of the portfolio. However, the risk-decreasing benefits of additional diversification will be at the forefront of declining returns when the investor does not have the time or expertise to select more than ten or twenty shares. (CNBC, 2019) According to Malkiel (1973), diversification in which the portfolio contains about 20 different stocks, reduces the risk of the portfolio by about 70 percent, and further diversification does not significantly reduce the risk thereafter (Stannard-Stockton, 2016). In the Helsinki Stock Exchange, by diversifying the portfolio among 10 shares, the standard deviation of annual return was about 19 percent and among 30 shares about 16 percent. Thus, this triple number of shares did not bring much additional diversification benefit. (Kallunki et al., 2019) As a result, diversification has repeatedly been found to reduce portfolio risk and increase expected returns.

However, the correlation of securities' returns determines the diversification advantage, so many different securities by themselves does not guarantee a diversification advantage, but a negative or weak correlation. So, for example, a portfolio consisting of stocks of several tech companies isn't optimal or even well-diversified. (Biswas, 2015) These earlier studies and perspectives were also used in this thesis. Later in the thesis, portfolios with low and high ESG scores created for empirical research are presented by selecting stocks of 10 companies operating in different industries.

2.2.2. Diversification risks in SRI

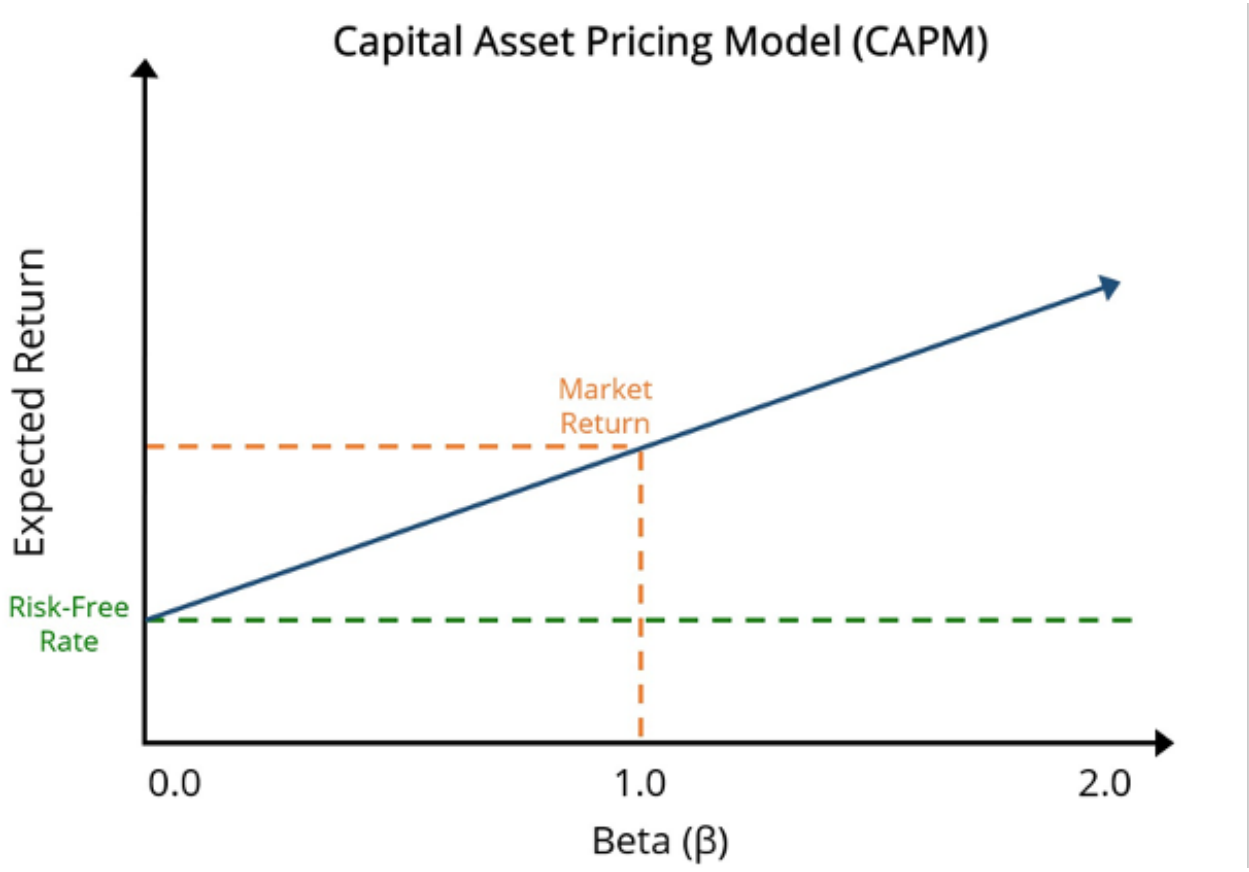
The purpose of diversification is to reduce or eliminate unsystematic risk in a portfolio. By selecting only certain types of companies in certain industries for a portfolio, the full potential of diversification is not reached as for example ESG standards eliminate a significant portion of potential investment options from a pool of all options. As a result, portfolio volatility increases and risk-adjusted returns decline. Investment strategy which uses negative or positive screening, can be seen as at least partially benefiting and penalizing certain industries. The cost of implementing socially focused metrics in an investment strategy also consumes revenue indirectly and cannot be ignored entirely. (Sauer, 1997) For example, the ESG data used in this thesis is from EIKON/Thomson Reuters' paid DataStream service, the license fee of which can be considered part of the costs of implementing such an investment strategy. Temper (1991) estimated that funds that emphasized responsibility in their portfolios created about 1% lower returns than fully diversified funds. According to the results obtained by Rudd (1981), portfolios from which companies with holdings and operations in South Africa were eliminated achieved a 4 percent lower return. (Iraya, 2018) It has been suggested that the declining return and increasing risk resulting from the emphasis on responsibility acts as a cost of positive externalities (Michelson, 2004).

2.3. Capital Asset Pricing Model

Sharpe (1964) and Lintner (1965) presented the Capital Asset Pricing Model (CAPM) for estimating the long-term risk-adjusted return on a portfolio. Decades later, CAPM is still widely used to assess the cost of capital for companies and the success of their investment portfolios. It is presented or used in almost all risk-return research and takes up a significant portion of the investment and corporate finance textbooks. (Fama & French, 2004; Levy, 2012; Markowitz, 2010)

CAPM, which is considered to be the equilibrium model of the securities market, is based on the idea that the expected return of investment should exceed the risk-free return, and the expected return should increase as the risk level increases. According to CAPM, a risk-free return plus a risk premium, based on the beta of security, determines the security's expected return (CFI, 2022). By diversifying the portfolio, idiosyncratic, unsystematic risks can be removed. CAPM specifically focuses on the systematic risk which cannot be eliminated through diversification and on its relationship between the expected return for assets, particularly stocks. (Kenton, 2022; Levy, 2012; Sharpe, 1964) This is very important information for investors. CAPM has faced criticism over its fundamental assumptions. CAPM is based on Modern Portfolio Theory and relies on assumptions about investor behavior, risk and return distributions, and market fundamentals that do not match reality. (Fama & French, 2004; Kenton, 2022)

Based on CAPM, risk-adjusted returns on the portfolios are calculated as well as Jensen's alpha to dictate if excessive returns by socially responsible investment strategy can be achieved in this thesis. To justify the increasing returns investor receives by bearing additional systematic risk - it is essential to understand how the standard deviation of a single stock added to a portfolio affects the standard deviation of the portfolio. Therefore, the usage of CAPM in this thesis is well-founded. Below you can see the image of the model.



Source: Wall Street Prep

3. Socially responsible investing

This chapter will introduce the theory of socially responsible investing and go through the different strategies used in SRI. This chapter will also explain ESG score in further details.

Responsible investing is a comprehensive term used in the investing world. It is very multidimensional and can be approached from many different perspectives. When investors talk about responsible investing, it is often referred to as socially responsible investing (SRI). Nowadays, responsible investing is possible to be part of all types of assets, and many investors consider investment activities based on the many different approaches you can take in SRI strategy. Despite the popularity of responsible equity investing, responsible investing is not limited to any particular asset class. Investors implement very differ (Finsif, 2015).

As stated before, SRI as a phenomenon has taken a massive leap into the public knowledge, and its popularity has risen immensely in recent years- yet it is not exactly a new thing if you look at the recent history. Foundations for today's SRI were first really laid down in the early 1980s. France and USA were the first countries where some stage of ESG screening was implemented in the decision-making over the possible investment. The market for responsible investing was still relatively small at that time, and responsible investing was something mainly done within various religious investor groups. The goal behind this was not to maximize risk-adjusted returns but to create a positive impact through financing. The very first socially responsible investment fund was established in 1971 called the “World Pax Fund” when the USA was still fighting in the Vietnam war. The founder of the fund was against the war in Vietnam and demanded that the fund’s assets wouldn’t be invested in the arms industry. ESG has become more popular over the last 20 years, and in 2006 UN formed the principles for socially responsible investing. These principles are used still to this day and are the basis of which almost the entire market for responsible investment operates today. The United Nations published the fundamentals of Socially responsible investing in 2006. To this date, more than 1000 stakeholders has signed the principles and promised to take the principles into account in their investments.

These principles were designed to enable operators to act in the long-term interests of their beneficiaries. UN signatories believe that environmental, social and governance (ESG) factors contribute to the success of the portfolios. Down below is listed the six principles for Responsible investment. These principles were made by an international group of investors whose interest was to bring out the ESG issues and bring them to investment practices. (UNPRI)

UN Principles of responsible investment:

1. We will incorporate ESG issues into investment analysis and decision-making process
2. We will be active owners and incorporate ESG issues into our ownership policies and practices
3. We will seek appropriate disclosure on ESG issues by the entities in which we invest
4. We will promote acceptance and implementation of the principles within the investment industry
5. We will work together to enhance our effectiveness in implementing the principles
6. We will each report our activities and progress towards implementing the principles.

Source: UNPRI

3.1 Socially responsible investing strategies

There are many different investment strategies where an investor can choose from. There are mainly three strategies that investors have used in recent years: screening, shareholder advocacy, and community investing. Since responsible investment techniques are not mutually exclusive, they can be used simultaneously. For example, an investor can share purchase, then eliminate companies that don't match the investor's responsibility requirements. The following section discusses the three different investment strategies. (Finsif, 2015)

Negative screening is a strategy where an investor eliminates or reduces a specific investment strategy. The reason for this is that investors want to make a change and reduce the portfolio's impact on for example, ESG factors (Environmental, social, governance). Usually, investors know that they cannot directly affect certain matters but by screening investments, they can achieve a more responsible portfolio and achieve their goals. The idea is that the investors and consumers are able to affect the decision-making that is followed by others. (Schueth, 2003). In negative screening, the investor usually excludes the companies that promote firearms, alcohol, tobacco, and gambling. (Kempf, Osthoff,2007)

Positive screening, on the other hand, is the opposite of negative screening. Positive screening is part of ESG integration which means it takes into account the ESG criteria and has adapted responsible practices. In the so-called “Best in class investments”, only the best companies are selected. Initially, narrowing the criteria will certainly increase the risk-adjustment return. Risk-adjusted returns will begin to decline if the requirements are reduced further on. (Nordea 2022)
The best-in-class approach is when an investor does not exclude some controversial sector, for example, alcohol, guns, or fossil fuels the idea is. The idea is to invest in companies that are at the top of their sector in ESG metrics and meet the criteria for ESG analysis. The controversial companies are left off and focus more on the leader of the ESG metrics. (Robeco,2021) This study uses the best-in-class method since the high ESG portfolio is gathered from the best-in-class ESG combined scores. This way, the portfolios have the highest possible ESG companies from the industries that are compared to the low ESG portfolio.

Shareholder advocacy is also a common responsible investment strategy. The idea is to influence corporate behavior in a positive way. The investor uses his ownership ability and rights to get his word heard for more responsible operations and a better investment return from the clients. This can also lead to activity that can influence the market standards and practices in the industry. For example, to improve effectiveness, the investor can communicate with the company, participate in the decision-making process at the meeting, offer general ideas in the meetings, and conduct a conversation with the owners. Also, contributing to public discussions are a very good example of shareholder advocacy. (Finsif, 2015)

Community advocacy brings private and public funding and investments to communities which lack the opportunities to receive it on equally beneficial terms. Investors provide communities with the capital, credit, and training in the hope of improving the quality of life in the community. They also provide knowledge, education, and tools for their families, themselves, and the communities. (USSIF, 2021). Most low-income communities don’t have any access to the things I brought out earlier. Community development financial institution (CDFIs) is an institution where many investors donate a small percentage of their investments to disadvantaged communities. (Schueth 2003) Overall, community advocacy corresponds to approximately one percent of all USA SRI investing. (Simone & York, 2009).

3.2. ESG scoring

The environmental and social responsibility scores for the ESG scores are based on The Refinitiv Business Classification (TRBC) industry scores, based on the fact that these factors are in line with the guidelines for companies in the same industry. Since the thesis examines the ESG scores of the companies selected for the portfolio, it is critical to understand the basics of ESG. It is not enough anymore for investors to make only a profit from their investment strategies. However, they also focus on incorporating environmental, social, and governance or, in other words, ESG for their long-term investment strategies.

The debate over measuring corporate responsibility has been widespread in the past 20 years. The Kinder, Lyndenberg, Domini & Co sustainable score (KLD) has provided a good basis for ESG measurement. (Liang, Renneboog,2017). Many other agencies have followed the ratting that KLD had, such as Vigeo and Thomson Reuters Asset4. The Thomson Reuters ESG score is one of the most comprehensive in the world, based on the financial statements, its websites, securities market, corporate responsibility reports, and a vast variety of news sources. Thomson Reuters collected data covering more than 400 different factors and selected about 178 of the most appropriate indicators to use in the company's final ESG assessment. (Thomson Reuters, 2017) Nevertheless, there are also critical views about the ESG score for researchers and investors.

Drempetic, Klein, and Zwergel's research paper suggest that in most cases, the ESG score does not provide the researcher or the investor with enough information for their analysis. There has been a relatively small amount of critical review of ESG scores, even though it has had tremendous growth in responsible investing. It can be assumed that such an evaluation mechanism involves at least some imprecision and margin of error. The Thomson Reuters ASSET4 ESG score used in this research was also found to be highly correlated with the company size. The larger the company, the more resources there are for producing and publishing high-quality integrated reports and other material to support ESG scoring. It is worth considering whether large companies benefit too much from ESG scores and whether investors who emphasize responsibility when choosing investment targets have a real understanding of the difference between the responsible scores of small and large companies. (Drempetic, Klein, Zwergel,2019).

4. Data and methodology

This chapter provides an overview of the materials and research methods used in the empirical part of the thesis. Quantitative research has been used in the research. The chapter also describes the portfolios that were created for the thesis and the benchmark index S&P 500 used for comparison. The end of the chapter contains the research methods used in this research. There is a short description and the calculation formula of the methods, Treynor's ratio, Jensen's Alpha and Sharpe Ratio. The chapter also justifies the selection of markets-based national indicators. Research material was collected using the Thomson Reuters DataStream. Research material for the paper is monthly time-series data of Total return index (TRI). TRI is an equity index which takes both the capital gains as well as cash distributions, such as dividends or interest into account.

Responsibility data used in this thesis is the ESG combined score, which is essential for the research since the data must be reliable to get as precise ESG scores as possible. ESG combined comprehensive score assessments of each company's ESG performance, which are reported based on the information received from the company's reports and many other outlets and sources. The company's performance is commitment to the three basic pillars of E, S and G pillars and also 10 themes such as human rights, shareholders, emissions and environmental product innovation. These were an example of the themes used since it has a few more themes that weren't explained. These reports use publicly reported data and takes into account the negative impact of ESG controversies taken from the global media sources to get an even more comprehensive ESG combined score. (Refinitive, 2021) The regression of the thesis was performed using Microsoft Excel.

4.1 Research portfolios

Stocks on the New York stock exchange are constructed from a combination of sustainable scores, with high ESG and low ESG scores, and their total returns are compared based on the monthly time series data from January 1, 2017, to December 31, 2021. These portfolios were created in such a way that companies with low and high ESG scores in the portfolio correspond to each other by industry. The shares in the NYSE portfolios have also been selected as accurately as possible so that the portfolios are comparable in content. The industry Classification Benchmark (ICB) structure from FTSE Russel, a subsidiary of the London Stock Exchange group, is used for the industry selection and classification in this portfolio. This is done so the low and high portfolios would be as similar to a business as possible. This data is available in the ASSET4 database what was used in this thesis. Both of the portfolios include 10 different equities to match the weight of an individual share in the portfolios. This decision is based on practical and adequate markets, which is explained in chapter two. The company size isn't used as a precise classification factor in this study, yet the minimum size requirement of 1 billion annual revenue has been implemented to increase the comparability of the portfolios. United States represent the market economy in this paper and that is one reason for it being selected for this thesis since it is the biggest market in the world.

New York stock exchange is the world's biggest equities-based exchange market in the world and for that reason it was selected for this thesis. NYSE dates back to1792 making it one of the oldest stock exchanges and the oldest publicly traded companies are mostly listed in the NYSE (Kenton,2019). Thomas Reuters has set the ESG score to the scale of 0-100. The average ESG score in the high ESG portfolio is 82,81 and the low ESG portfolio has an average ESG score of 21,58.

High ESG portfolio

COMPANY	INDUSTRY/ICB	ESG SCORE 2017-2021
INTL.FLOVORS&FRAG.	Chemicals/5520	81,49
KOHL'S	Retail/4040	72,63
COLGATE-PALM	Personal care, Drug, And grocery stores/4520	87,38
HESS	Oil, Gas and Coal/6010	78,72
S&P GLOBAL	Finance and Global services/3020	82,00
AGILENT TECHS.	Medical equipment and services/	88,55
OWENS CORNING	Construction and materials	91,93
HEALTHPEAK PROPERTIES	Real Estate investment trusts	83,46
KBR	Software computer services	83,62
TELUS(NYSE)	Telecommunications Service Providers	78,36

Source: Authors calculations on ESG score, Thomson Reuter DataStream

Low ESG portfolio

COMPANY	INDUSTRY/ICB	ESG SCORE 2017-2021
QUAKER HOUGHTON	Chemicals	22,55
MURPHY USA	Retailers	25,14
PERFORMANCE FOOD GROUP	Personal Care, Drug and Grocery Stores	25,23
CONTINENTAL RESOURCES	Oil, Gas and Coal	23,67
COMPASS DIVERSIFIED	Investment Banking and Brokerage Services	20,93
TELADOC HEALTH	Health Care Providers	25,30
EAGLE MATERIALS	Construction and Materials	8,36
FORESTAR GROUP	Real Estate Investment and Services	16,91
TWITTER	Software and Computer Services	25,34
UNITED STATES CELLULAR	Telecommunications Service Providers	22,41

Source: Authors calculations on ESG score, Thomson Reuters Datastream

4.2. S&P 500 Index and risk-free return

The benchmark index used in this study is the total return of the S&P 500, which describes the USA market and the development of stock price, including any dividend payments by companies included in the index. S&P 500 has the leading 500 biggest publicly traded companies, but that does not mean they are the biggest 500 companies by market cap. It is still the best gauge of the most extensive USA stocks. (Kenton 2022, Investopedia). S&P 500 covers nearly 80 percent of the market value of all listed companies in the United States. The index is fairly close to the development of the largest companies in the United States and at the same time the world. (S&P global, Nordnet). The figure below illustrates the cumulative five-year return of the benchmarks index from 2017-to 2021.

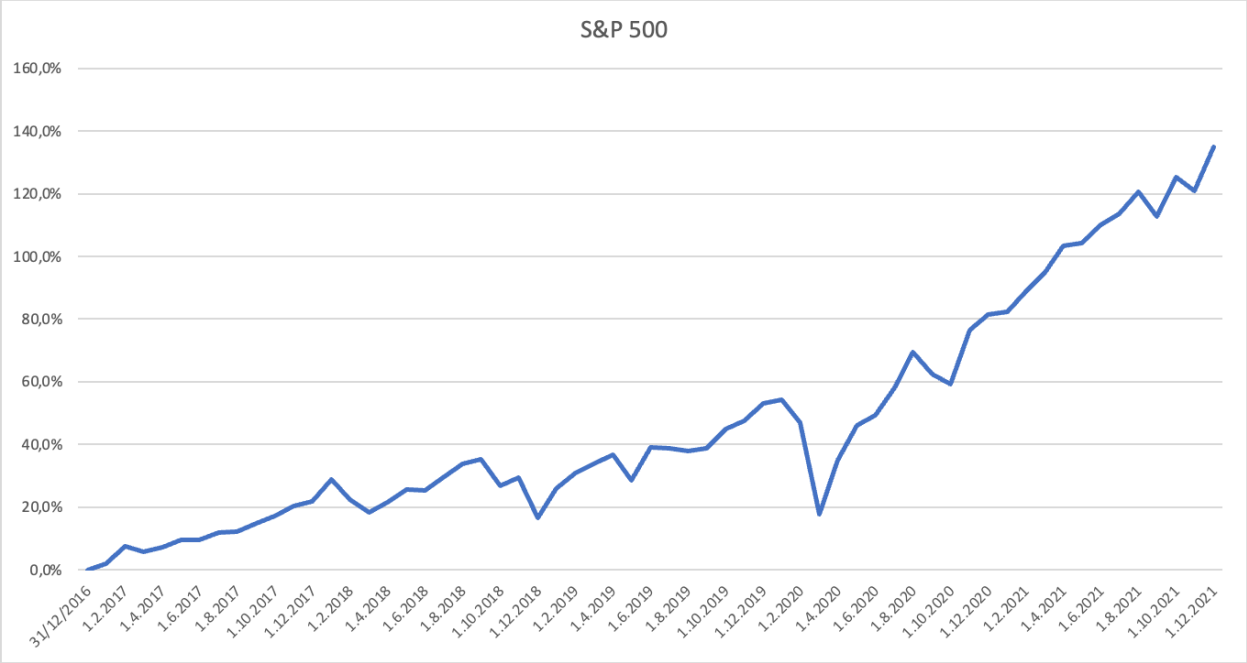


Figure: S&P 500 growth during 2017-2021

Source: Authors calculations, Thomson Reuters Datastream

The risk- free return on the New York stock exchange portfolios was chosen to be the three-month U.S. Treasury Bill. The treasury bill is a short-term debt instrument issued by the U.S. government and guaranteed by the U.S. Treasury for a term of up to one year. (Kenton, 2021). Since the yield on 3- month Treasury bills fluctuates appropriately over the 5- year period of the thesis, the risk-free rate used in the risk-adjusted indicators in the thesis is an average of the monthly yield observations for the time period of 2017-2021. The risk-free rate has been set to 1,05%. The development of the three-month treasury is shown in the picture below.

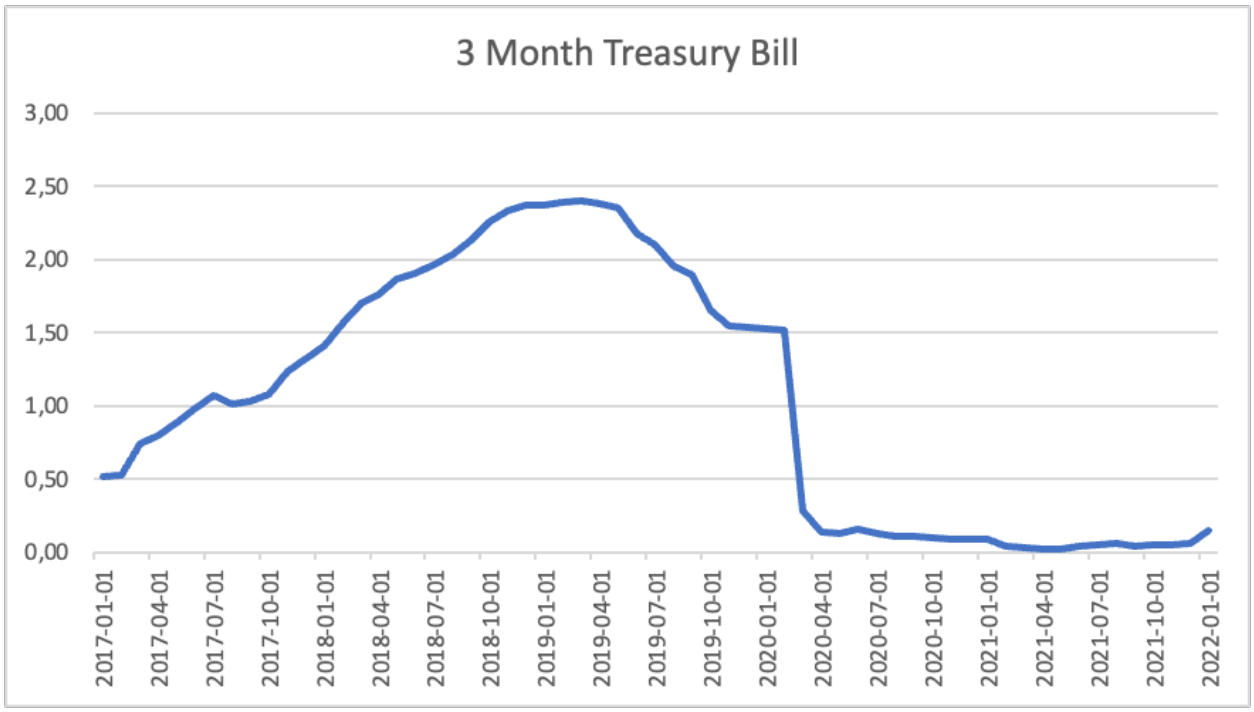


Figure: USA 3-month Treasury Bill during 2017-2021

Source: Authors calculations

4.3 Research methods

4.3.1. Sharpe ratio

Twenty-five years ago, an American economist called William Sharpe (1966) introduced a key performance indicator known as the Sharpe key. It is one of the most used risk-adjusted return measures there are. The idea of the Sharpe method is to measure the risk-adjusted return per unit of risk in the specific portfolio. The higher the value of the Sharpe ratio, the better the risk-adjusted return of the portfolio. The Sharpe number is calculated according to equation one below. (Corporate, 2015)

The Sharpe ratio is represented by the mathematical formula (1) below:

$$\boldsymbol{Sp} = \boldsymbol{Rp} - \boldsymbol{Rf} \,/\sigma \mathrm{i}$$

$\boldsymbol{Sp}$= Sharpe ratio for the portfolio

$\boldsymbol{Rp}$= Yield of the portfolio

$\boldsymbol{Rf}$= risk-free Yield

$\boldsymbol{\sigma i}$= portfolios volatility

4.3.2. Treynor ratio

Treynor (1965) was introduced as a measure of portfolio performance that, like the Sharpe ratio, compares the return to the risk-free portion of the specific portfolio. The difference between Treynor and Sharpe is the risk variable used. The Treynor ratio is a beta factor that describes market risk and the systematic risk of the portfolio. (Morey, Morey 2000). The method of calculation is shown below (2).

$$T = Ri - Rf / \beta i$$

T = Treynor ratio of the portfolio

Ri = Yield of portfolio

Rf = risk-free Yield

βi = portfolios beta

4.3.3. Jensen alpha

Jensen's Alpha is a measure of risk-adjusted return named after its developer, Michael C. Jensen. Jensen presented his metrics in his 1986 academic paper, which is called "The performance of mutual funds 1945-1964". (Jensen 1986). Alpha describes the performance of a stock portfolio in relation to the risk it contains. It is derived from the CAP model. The numerator measures difference between a portfolio's actual return and its expected return. Jensen's Alpha is often used to test CAP models, but investors can also use this metric to report a stock's high or low performance relative to the market risk.

$$\boldsymbol{\alpha p} = \boldsymbol{Rp} - [\boldsymbol{Rf} + \boldsymbol{\beta p} \times (\boldsymbol{Rm} - \boldsymbol{Rf})]$$

$\boldsymbol{\alpha p}$=Jensen alpha portfolio

$\boldsymbol{Rp}$= Portfolio yield

$\boldsymbol{Rf}$ = Risk-free return

$\boldsymbol{\beta p}$= Portfolios Beta

$\boldsymbol{Rm}$= Market return

5. Results

This chapter aims to answer the research questions of the thesis on the profitability of responsible investment in the United States from 2017- to 2021 and present the research findings comprehensively. The chapter will begin by introducing the annual and cumulative return from the high and low ESG portfolios and the benchmark index S&P 500. Followed by results obtained using the metrics included in the research methodology of the previous chapter. A summary of the full results is at the end of this chapter.

5.1. Returns

Table: Annual and cumulative returns

	NYSE High ESH	**NYSE Low ESG**	**S&P 500**
Annual return	21,47%	26,13%	20,45%
Cumulative return	132,9 %	168,3%	134,9%

Source: Authors calculations

The table above shows that the best returns from 2017-to 2021 came from the NYSE low ESG portfolio, which outperformed the benchmark index S&P 500 and the high ESG portfolio. The low ESG portfolio's annual return was 26,13%, and the cumulative return was 168,3 %. NYSE's high ESH portfolio performed better in annual return (21,47%) than the benchmark index S&P 500 (20,45%). On the other hand, the S&P 500 performed better in cumulative returns (134,9%) than the NYSE high ESG portfolio (132,9%). Overall, the table shows that the overall returns during this time period, 2017-2021, gave extensive returns in the portfolios and the index S&P 500.

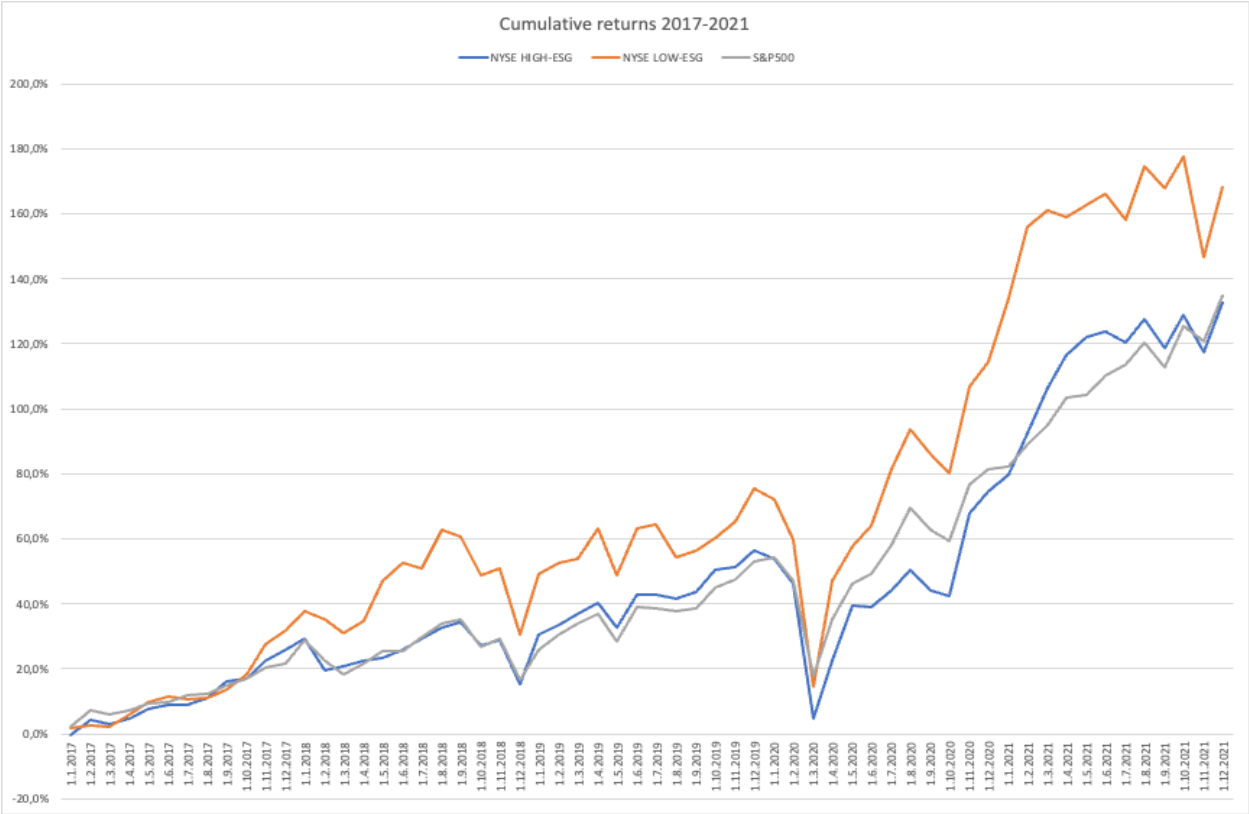


Figure: Cumulative returns 2017-2021

Source: Authors calculations

5.2. Risk-adjusted results

Using metrics is an essential part of analyzing the success and performance of the portfolio. Looking just into the returns alone gives a very narrow perspective of the returns. It is important to take risk into account in this specific study since risk and return goes hand in hand based on the financial theory. The table below shows the Sharpe's numbers and also the factors that affect them. As expected, the benchmark index had the highest Sharpe ratio with 3,85, and it can be explained by its low standard deviation (volatility) of 5,04% and high annual returns. The low volatility can be explained by the broad diversification of the 500 companies in the S&P 500. The NYSE low ESG portfolio has a high Sharpe ratio and volatility (7,59%, 3,30) than the NYSE high ESG portfolio, which has a Sharpe ratio of 3,20 and volatility of 6,38%.

Sharpe ratio	NYSE High ESG	NYSE Low ESG	S&P 500
Annual return	21,47%	26,12%	20,45%
Risk-free return	1,05%	1,05%	1,05%
Standard deviation	6,38%	7,59%	5,04%
Sharpe	3,20	3,30	3,85

Source: Authors calculations, Thomson Reuters DataStream

The beta component of Treynor's figure measures the market risk. For a constructed portfolio, this means that the risk of the portfolio is proportional to the risk of the market index, which forms the beta factor. The highest return came from S&P 500 with the Treynor number of (0,19), but that can be explained due to the beta of 1 in the market portfolio. The results are presented below in the table. The low ESG portfolio (0,17) barely has a lower Treynor's ratio than the high ESG portfolio (0,18). This means that responsible investing cannot be considered more profitable than investing in market indices.

	NYSE High ESG	NYSE Low ESG	S&P 500
Annual return	21,47%	26,12%	20,45%
Risk-free return	1,05%	1,05%	1,05%
Beta	1,19	1,36	1,0
Treynor	0,17	0,18	0,19

Source: Author calculations, Thomson Reuter DataStream

Jensen alpha is measured to see if there is any potential excess. The table below shows the Jensen's results. None of the portfolios produced high return than the CAPM expected. Again, the low ESG portfolio (-1,31) was the closest to the efficient frontier. This shows again that excessive return cannot be achieved through responsible investing. The high ESG portfolio has a Jensen of (-2,72).

Jensen Alpha	NYSE High ESG	NYSE Low ESG	S&P 500
Annual return	21,47%	26,12%	20,45%
Risk-free return	1,05%	1,05%	1,05%
Jensen	-2,72%	-1,31%	

Source: Thomson Reuters DataStream

Overall, the portfolio performance and return results above provide very consistent results. The S&P 500 market portfolio was the best performer in all of the risk-adjusted metrics in the paper. However, the low ESG portfolio outperformed the S&P 500 and the high ESG portfolio in annual and cumulative returns. Since risk and return go hand in hand, it is critical to analyses both because it is essential to determine the overall success and not just the annual and cumulative return.

The cumulative return chart shows that the market has been broadly in line, and timing has been about the same, but the low ESG outperformed both low and high ESG by more than 30%, which is quite a lot in today's market. The portfolios made in this thesis did not perform as well as measured by risk-adjusted measures due to the excellent performance of the market portfolio S&P 500 and the large-scale unsystematic risk-reducing diversification. The global coronavirus pandemic can explain the strong market reactions which shook the stock market worldwide. Even though the coronavirus was severe, the market bounced back almost within a half a year back to the same level it was.

It is clear that in the time period from 2017 to 2021, the risk factor and volatility of the portfolios has created from the exceptionally strong market volatility. During this time period, the market has had its good and bad. An excellent example of that is the coronavirus that came in 2020. The market came heavily down during the first months, but after that, it increased tremendously and has led to exceptional yearly returns in almost every industry. The ESG score has also been chosen that the beginning of the study is 1 January 2017, so it is likely possible that there have been changes in the scoring during this researched time period. The reasons mentioned above show that the results can be partly explained, but any conclusions are hard to draw based on the results.

Conclusion

The impact of climate change on human health, the living environment, and the future is significant and clearly visible in today's world. Channeling the capital to places that have a positive impact on the state of the planet and the development of it rather than negative externalities is one of the most essential preconditions for a healthy future for the civilizations of humans. Responsible investing is the trend in this direction. The purpose of this thesis was to examine the success of responsible investment strategies in the USA market from 2017-to 2021. The USA market is one of the biggest markets in the world, which makes it an exciting market to examine. In this work, Low and high ESG combined score portfolios were created from the shares of the companies traded in NYSE. These portfolios were compared to each other and also to the benchmark index S&P 500.

The portfolio analysis was able to answer the research question: How successful has the socially responsible investment strategy been in the New York stock exchange from 2017-to 2021. Given the results, responsible investment strategies have been successful. Low ESG outperformed the high ESG portfolio, but despite that, the results were very close to each other. For the sub-question, how did the U.S. high and low ESG scoring portfolios perform relative to the S&P 500 index? The low ESG portfolio performed better than the S&P 500, but the S&P 500 performed better than the high ESG portfolio. Looking at the risk of the portfolios, the Low and High portfolios didn't perform as well as the benchmark index S&P 500.

As mentioned earlier in this thesis, previous research on responsible investing has been contradictory. It has been suggested that the lower returns and increasing risk resulting from the emphasis on responsibility, acts as a cost of positive externalities (Michelson, 2004) This can be shown to have happened in this thesis, as the high ESG portfolio had lower returns compared to others. The thesis results are challenging to implement in the form of an investment strategy because the excess returns of responsible investing have not been consistently obtained. This can be because of number of reasons, but the main reason behind it is the diversification benefit the market index enjoys in this comparison.

Overall, the thesis provides the reader with information about socially responsible investing and expands the knowledge of market and portfolio analysis. Possible topics for further research could be extending the study period and adding a totally different market for more comparative research.

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