

**UNIVERSITY OF VAASA**  
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**PERFORMANCE OF SOCIALLY RESPONSIBLE INDICES**  
**Evidence from Europe and the U.S.**

Master's Thesis in  
Accounting and Finance

Master's Degree Programme in Finance

**VAASA 2019**



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**Topic of the Thesis:**
Performance of socially responsible indices  
- Evidence from Europe and the U.S.
**Supervisor:**

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**Degree:**
Master of Science in Economics and  
Business Administration
**Master's Programme:**

Master's Degree Programme in Finance

**Year of entering the University:**

2013

**Year of completing the thesis:**

2019

**Pages: 65**


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**ABSTRACT**

Socially responsible investing (SRI) and as well as other related phenomena have rapidly become increasingly popular in the recent decades. People are more aware of environmental issues and want to favour the responsible options in everyday life. A number of socially responsible and ethical funds, indices and investing strategies have emerged, and investors' knowledge of the topic has increased. This thesis examines the topic of socially responsible investing and investigates whether it is possible to earn abnormal returns when investing in socially responsible indices compared to investments on conventional benchmark indices. The previous literature has found both out- and underperforming of socially responsible investments, and therefore this thesis continues the investigation on the topic.

The data of the thesis covers the years from 2001 to 2018. Moreover, the data has been divided into three different time periods due to the aim of investigating whether there is an effect of markets' fluctuation on the returns between socially responsible indices and conventional benchmark indices. The Financial crisis of 2008–2009 is an indicator of market downturn. Four different SRI indices and two conventional benchmark indices are used in the investigation. The thesis considers both the U.S. and Europe. The main empirical methods are the Capital asset pricing model (CAMP) and Fama-French three-factor model.

The regression results vary depending on the model used. The main finding is that it is possible to find abnormal returns before the financial crisis at the beginning of the 2000s. During and after the financial crisis the abnormal returns are mainly insignificant with both methods. The results show significant results also for the full period, but these results are mostly driven by the pre-crisis period. The increasing knowledge of the issues related to social responsibility might also be one reason for the insignificant results. Both the previous literature and the empirical results of this thesis find conflicting results, which indicates that the topic still needs further investigation.

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**KEYWORDS:** Socially responsible investing, SRI, investment performance, market downturn



## 1. INTRODUCTION

Socially responsible investing (SRI), also called ethical investment or sustainable investment, has grown to a significant factor in businesses and financial investments around the world during the last few decades. Shortly, SRI is a long-term oriented investment approach that focuses on environmental, social and governance (ESG) factors (Eurosif 2018). Nowadays, firms have to consider more SRI in order to be a more desirable operator in the market. Individuals are more aware of the things that are healthy for the environment and themselves. They know the cause and effect of the climate change, global warming, the addictive effects of tobacco and alcohol, and the human right issues. It has become common to pursue healthier and more environmentally friendly options in various areas of daily life, and thus responsible investing has become of interest also for many investors. In a socially responsible investing, non-financial criteria emerge, and stand out as a crucial factor, besides the financial criteria.

At the latest, the financial crisis of 2008–2009 shows the importance of corporate social responsibility (CSR) which means a company's commitment to participate in sustainable economic development (World Bank 2003), and the term is highly associated to the socially responsible investing. As Lins, Servaes, and Tamayo (2017) find, during the financial crisis, firms that had higher social capital performed better, and they also had higher stock returns than firms with lower social capital. In this case, social capital means the intensity of corporate social responsibility. The socially responsible investing industry is a relatively recent phenomenon (Schueth 2003). It has rapidly increased in the last decades which can be seen from an increased number of ESG (environmental, social and governance) funds offered in the U.S. In 1995, the number of ESG funds in the U.S. was 55, and in 2016 the amount was 1002. The total net assets of the funds were \$12 billion in 1995 whereas it was \$2,597 billion in 2016. (US SIF Foundation 2016a.) Moreover, the U.S. SRI assets show the increase of the SRI aspect as well. In 2016 the SRI assets were \$8.72 trillion of the total \$40.3 trillion assets in the U.S. (Renneboog, Horst, and Zhang 2008b; US SIF Foundation 2016b.)

Statman and Glushkov (2009) notify that socially responsible indices have different socially responsible criteria and different weights of the SR objects, such as environment, corporate governance, or companies from different industries. For example, Statman (2006) points out that the Calvert Index weights the corporate governance and the DS 400 Index is the strongest

on the environment. This observation has an impact on the results of SR investing which can also be seen in the section of ‘Literature review’. Furthermore, Auer (2016) points out that investor can choose investments that are in line with his ethical beliefs and personal values without being afraid of losing positive performance, which ensures at least positive ethical and social output.

Even though socially responsible investing is trendy and socially profitable, it is not an obvious way to earn excess returns on investments. Many previous studies (see Bello 2005; Schröder 2007; Li, Cheung, and Roca 2010; Leite and Cortez 2015) have not found excess returns investing in SR indices or funds, or they have even found negative returns compared to conventional benchmark investments. However, there are still several studies (see Statman and Glushkov 2009; Eccles, Ioannou and Serafeim 2014; Auer 2016) that have found excess returns, which makes this topic interesting to investigate. The third chapter goes more through the previous literature and their results. Moreover, there are different views on how to limit the SRI aspect in investments which also affects the investment results. The increase of SR-related funds and assets reflects the rise in awareness and interest in socially responsible investments. This argument gives excellent support to investigate this topic in this thesis.

### 1.1. Purpose and motivation of the study

The increased amount of studies and a wide interest towards it makes the topic ‘socially responsible investing’ even more significant both in business and in general. To broaden the knowledge of the topic, the purpose of the thesis is to investigate whether socially responsible investing is more profitable than investing in corresponding conventional options. The thesis concentrates on indices. Also, another purpose is to find out, is there any difference whether investing in SRI or conventional indices during the market’s downturn. The examination concentrates on the latest financial crisis during 2008–2009 because the crisis was a substantial effective factor in the U.S. and European markets.

Many studies (see Renneboog et al. 2008b; Li et al. 2010; Nofsinger and Varma 2014; Chan and Walter 2014) investigate only the U.S. markets, but some studies (see Hill, Ainscough, Shank, and Manullang 2007; Henke 2016) examine both the U.S. and Europe. In addition,

some studies investigate only Europe (see Cortez, Silva, and Areal 2009; Leite and Cortez 2015; Auer 2016). The wider concentration on the U.S. area leads this thesis to investigate both the U.S. and Europe. Moreover, the spread of the financial crisis in Europe gives an important viewpoint to concentrate on Europe also.

Many recent studies (see Bello 2005; Hill et al. 2007; Nofsinger and Varma 2014; Henke 2016) have been investigating socially responsible funds, and less focus has been placed on examining socially responsible indices. For example, Li et al. (2010) and Schröder (2007) examine socially responsible indices but their findings are neutral, neither out nor underperformance. A paucity of studies of socially responsible indices and an increased interest of the topic motivates this thesis to investigate the topic and concentrate especially on the socially responsible indices. In addition, the variability of results of socially responsible investing studies motivates more this thesis to examine whether it is profitable to invest in a socially responsible manner.

## 1.2. Hypotheses

This thesis examines whether socially responsible investing is a more profitable choice to invest compared to conventional investing. The hypotheses of the thesis are based on other studies that find extra return by investing in socially responsible portfolios. For example, Hill et al. (2007) find long term outperforming by investing in socially responsible mutual funds. In addition, Chan and Walter (2014) find long term outperformance when investing in environmentally-friendly companies. The first hypothesis is based on the studies above and is following:

H<sub>1</sub>: Socially responsible indices yield better than comparable conventional indices in the long term.

Nofsinger and Varma (2014) find outperformance of socially responsible mutual funds during the market crisis periods. Moreover, Lins et al. (2017) find high CSR (corporate socially responsible) rating companies outperforming low CSR rating companies during the financial crisis 2008-2009 that is consistent with results of Nofsinger and Varma. Based on

Nofsinger and Varma (2014) and Lins et al. (2017) findings the second hypothesis is following:

H<sub>2</sub>: Socially responsible indices yield better compared to the conventional indices during the financial crisis.

Answers for the hypotheses will be discussed in the empirical part of the thesis.

### 1.3. Structure of the study

The thesis goes through the theory, history and literature of socially responsible investing, and takes overview of the most important financial theories related to the empirical research. In addition, thesis explains the data and does the empirical research. The next chapter explains the basics of Socially Responsible Investing and related topics, such as history, definition, index and fund comparison, SRI strategies and the Financial crisis. The third chapter presents an overview of the related literature. The fourth chapter goes through the important theoretical instruments related to the empirical part of the thesis. The fifth chapter describes the data and methodology. The sixth chapter explains the results of the regressions and the last chapter concludes the thesis.

## **2. SOCIALLY RESPONSIBLE INVESTING AND RELATED TOPICS**

Knowledge of sustainable development has recently raised, and the theme has become trendy among people around the world. Firms, businesses, governments have started to attend sustainable issues. The term ‘sustainable development’ is an ambiguous term and it does not have a clear definition. Lélé (1991) and Fergus and Rowney (2005) both investigate a semantics of the term sustainable development to clarify the meaning of the term. Their interpretations split the term to two words ‘sustainability’ and ‘development’, and thus go deeper into the words’ meaning. Their outcomes are nearly similar: they find ‘sustaining growth’ and ‘achieving traditional objectives and ecological sustainability’ and ‘success, measures with the financial bottom line as the base for all decisions’ (Lélé 1991; Fergus and Rowney 2005). These outcomes are so similar that the term ‘sustainable development’ is generally thought to include – both environmental and financial growth. This chapter will go through the history of socially responsible investing, define the concept of SRI, discuss the decision to use indices rather than funds in the thesis, list some SRI strategies, and say a few words about the recent Financial crisis that is used as an example of market’s downturn in the thesis.

### **2.1. History of SRI**

Even though the financial crisis in 2008–2009 shows the importance of trust, Lins et al. (2017) state that the concept of social responsibility and trust in finance and well-functioning markets is not new, as many earlier studies show. Carroll (1999) argues that, in the literature, the concept of social responsibility (SR) has been taken into account already in the 1930s and 1940s. Carroll (1999) adds that the consideration of social responsibility expanded significantly in the 1960s and 1970s. Socially responsible investing has evolved from religions such as from traditions of Jewish, Christian, and Islamic. In the early 1900s, single investors avoided to buy “sin” stocks of companies which are involved in tobacco, alcohol production, gambling or prostitution, and in addition, depending on religion, they avoided among other things companies that produced pork, pornography, and even bonds. The UK religions gave the recommendation to favour features such as temperance and fair

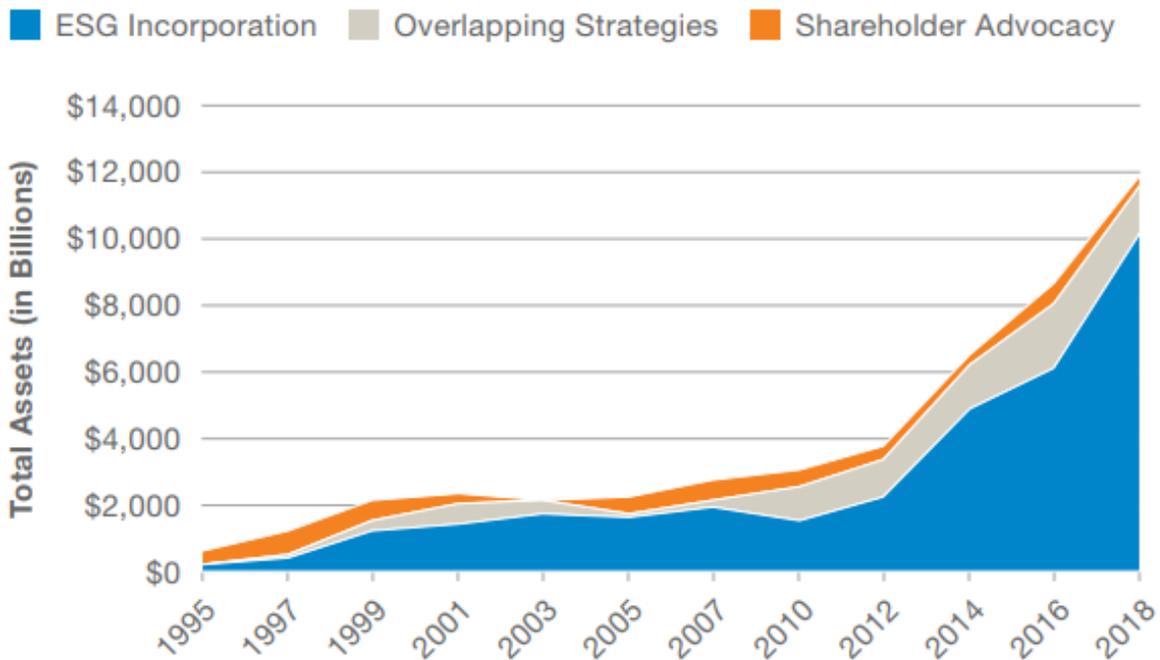
employment conditions in the investment decisions of individual people. (Sauer 1997; Broadhurst, Marshall, and Watson 2003; Baker and Nofsinger 2012.)

The concept of SRI started to spread in 1970 when the first actions were to avoid investing in companies that were associated with the Vietnam War and South Africa due to its apartheid policy. In addition, the environmental and corporate scandals, such as the Chernobyl and the Exxon Valdez oil spill, increased the knowledge of SRI among individuals. At the beginning of the 1990s, KLD Research & Analytics created the first social index called Domini 400 Social Index. Domini 400 index screens companies of S&P500 and chooses socially suitable companies that correspond to their requirements to the index. (Sauer 1997; Broadhurst, Marshall, and Watson 2003; Baker and Nofsinger 2012.)

According to Hill et al., (2007), the concept of social issues in businesses broadens in the 1970s as a result of the radical political agendas and reform movements in the 1960s. Schueth (2003) verify this view that the concept of SRI has spread rapidly after the mid-1900s. According to Schueth, the modern roots of the social investing stem from the 1960s and the movements widen during the 1970s including management and labour matters and anti-nuclear attitude. In the 1980s, the rank of concerned investors increased enormously due to the apartheid issues in South Africa. Most recently, Schueth mentions healthy working conditions in factories, human rights issues, and school killings have become meaningful factors for investors. (Schueth 2003.)

Even if socially investing has been an issue already from the beginning of the 1900s, in the 2000s the socially investing has taken a huge step forward, and it has increased enormously as the Figure 1 shows. The figure presents the trend of sustainable and responsible investing in the U.S. during the years 1995-2018. There is an apparent and steep increase in sustainable and responsible investing in recent years as the Figure 1 presents. At the end of 2017, investments by SRI strategies have been made \$12 trillion in the U.S. (US SIF Foundation 2018).

## Sustainable and Responsible Investing in the United States 1995–2018



SOURCE: US SIF Foundation.

**Figure 1.** Sustainable and Responsible Investing in the United States 1995-2018 (US SIF Foundation 2018).

### 2.2. Definition of SRI

The definition of socially responsible investing (SRI) varies a lot depending on the perspective, and there is no clear definition for the term. However, there is plenty of different definitions that try to clarify the meaning of the term, and this chapter will discuss them.

US Social Investment Forum has defined the term Socially Responsible Investing as follows:

*“Sustainable, responsible and impact investing (SRI) is an investment discipline that considers environmental, social and corporate governance (ESG) criteria to generate long-term competitive financial returns and positive societal impact. (US SIF 2016b.)”*

The idea behind socially responsible investing is that it combines social, environmental, and ethical issues into investment decision making (Renneboog, Ter Horst, and Zhang 2008a).

Responsible investing is understood to mean investing that considers the investments' effects on wider society and the environment already today and in the future. Also, the term can be defined to be the way in which a company shows to appreciate and to operate in a sustainable manner and with respect to the social and environmental aspects that will encourage investors to invest in the company due to these reasons. (Baker and Nofsinger 2012.) Socially responsible investing (SRI) is described to be an investment that observes companies of which the nature of the business is considered to be socially responsible (Baker and Nofsinger 2012). Behind the definition of Eurosif (2018), there is a thought of investors' better long-term returns and of firms' behavior to benefit society. SRI is also called green investing and ethical investing that describes the meaning of the term excellently.

The idea of socially responsible investing is to gain both financial and non-financial utility when investing in a socially responsible way. A manager of an SRI funds aims to offer products that are conformable with the investor's values and provide returns at the same time. (Benson and Humphrey 2008.) Renneboog et al. (2008b) express that the SRI funds are described to include environmental, social, ethical or corporate governance criteria. They mention that there are two types of goals that investors target in their investments of SRI funds. The goals are wealth-maximization in an economically rational way and social responsibility. (Renneboog et al. 2008b.) Bollen (2007) finds that the volatility of socially responsible funds is lower than the volatility of conventional funds, which shows that there is a positive impact when concentrating on socially responsible issues. In addition, Renneboog et al. (2008a) say that investors care less about financial performance, compared to conventional investors, if they obtain non-financial utility from investments in SRI funds or in companies that have high corporate social responsibility standards.

Socially responsible investing combines societal issues and personal values in investment decisions, especially, investing via social screens. Social screens usually do not include securities of companies in certain industries, such as alcohol, tobacco, gambling, and weapon production companies, and also, social screening obliges companies to have a good-quality social and environmental aspects. Investors use both positive and negative investment criteria in their investment decisions and choosing the securities where to invest. Screening means a selection to choose the best companies and stock to the portfolio that corresponds with the investor's values. (Bollen 2007; Nofsinger and Varma 2014.) Positive and negative screening is discussed further in chapter 2.5.

Derwall, Koedijk, and Ter Horst (2011) define the concept of SRI partly similarly than the definitions as mentioned above, but they also introduce their viewpoint for the concept. SRI is originating from religious investment and expanded to a large investment concept that meets different criteria. The term is not simple, and it faces the confusion of what it should include and exclude. "Value-driven" investment approach is a typical term to describe socially responsible investing because it includes social and personal values in the investment decisions instead of seeking only profit. Derwall et al. (2011) say that this "value-driven" approach implies that investors are able to accept financial losses when gaining non-financial utility from socially responsible investing. However, they add that currently the "profit-seeking" approach is possible also in SRI movements, so both the social responsibility and financial goals are in the consideration. (Derwall et al. 2011.) Concerning the Derwall et al. definition, Schueth (2003) describes two types of socially responsible investors. The first group wants to invest in securities that are close to their personal values, and thus they will feel better due to the investments. The second group wants to invest their money into securities that would improve the quality of life. They want their money to change society more widely. (Schueth 2003.)

### 2.3. Related topics

Many similar and interrelated terms are sometimes used as a synonym but, they differ slightly from each other. This section describes some SRI related terms.

Corporate Social Responsibility (CSR) is a fundamental term associated with socially responsible investing. World Bank (2003) defines Corporate social responsibility as follows: *“CSR is the commitment of business to contribute to sustainable economic development, working with employees, their families, the local community and society at large to improve quality of life, in ways that are both good for business and good for development.”* Bénabou and Tirole (2010) describe that CSR reflects different kinds of behaviors, such as being environmental-friendly, employee friendly, aware of ethics, and investor-friendly. Moreover, Albuquerque, Koskinen, and Zhang (2018) interpret the CSR as a long-term strategic interest for corporations and Carroll (1979) sums social responsibility of business including activities of ethical, economic, legal and voluntary expectations. Cochran and Wood (1984) mention two methods to measure CSR. The reputation index is the first method in which firms are rated based on social performance. The second method of Cochran and Wood is content analysis in which is measured the reporting extension of CSR activities in company publications, such as, in an annual report. (Cochran and Wood 1984.) According to Márquez and Fombrun (2005), there are three common steps to form a CSR rating that most agencies imply. At first, a company’s available external information is search, secondly, a questionnaire is sent to a company, and lastly, an agency interviews essential informants externally and internally (Márquez and Fombrun 2005).

ESG (an acronym of environmental, social, and governance) is another term that is used closely with socially responsible investing and other related topics. The term considers environmental, social, and governance factors in the analysis and decision-making of investments and portfolio constructions, and furthermore, it also captures financial elements in the process. The term includes both corporate social responsibility and governance actions, and the idea is to seek stocks with excellent ESG performance. (Starks 2009; MSCI 2018; Nofsinger and Varma 2014.) Halbritter and Dorfleitner (2015) argue that ESG ratings tell more precisely how a firm’s return is affected by sustainability aspects compared to SRI indices and funds and that originates from large panel data sets of ESG ratings. MSCI (2019a) has measured and modelled ESG ratings of companies over the past 40 years. They based the ratings on companies’ industry-significant ESG risk exposures and companies’ ability to manage those risks compared to other companies on the industry. They measure companies’ environmental, social and governance issues, that include, for example, climate change, pollution, human capital, product liability, corporate governance, and corporate behaviour.

These factors affect the overall scores, and finally, companies get rates from CCC (worst) to AAA (best) classes. (MSCI 2019a.)

Socially responsible investing and other similar concepts have adduced the performance of investments or firms. The idea behind responsible investing is to try to perform financially better than conventional investing, of course, alongside good social performance. McGuire, Sundgren, and Schneeweis (1988) find evidence for the abovementioned argument. Their data shows that firms with low a level of social responsibility experience the lower return-on-asset and stock-market returns. Also, Lins et al. (2017) find higher profitability of companies with high CSR-rating, at least during the financial crisis. High CSR also causes a higher gross margin and sales in Lins et al. (2017) findings that can be seen as better firm performance.

#### 2.4. SRI indices versus SRI funds

Many previous studies (see Hamilton, Jo and Statman 1993; Hill et al. 2007; Cortez et al. 2009; Nofsinger and Varma 2014) concentrate on funds when they examine SRI and other related topics. However, this thesis focuses on SRI indices instead of funds as there has not been as much research on the SRI indices yet. The essential difference between a fund and an index is the following. The fund is a product offered by financial institutions, and SRI funds' main purpose is to select such firms to funds that include social and environmental criteria in their operations. Whereas, an index is a "theoretical portfolio" which includes stocks of firms whose aim is to operate socially and environmentally responsibly. (Orsato, Garcia, Mendes-Da-Silva, Simonetti, and Monzoni 2015.)

Social screening of investments has been conducted for a long time, but sustainable indices are a relatively new phenomenon. For instance, the world's first sustainable index, KLD Domini 400 Social Index, launched only in May 1990. However, SRI funds are a much older concept in the investment industry. The PAX World Fund had launched already in 1971, and it is considered to be the first SRI mutual fund. Its target was to avoid military-related stocks in investments. (Broadhurst, Marshall, and Watson 2003; Fowler and Hope 2007; PAX World Fund 2018.)

Statman and Glushkov (2009) mention that the comparison between SRI stock indices and conventional stock indices is not confounded by expenses and skills. That helps in understanding the relationship of returns between SRI stocks and conventional stocks. They argue that investing in socially responsible mutual funds investors do not get a good understanding of socially responsible companies' relative stock returns. That originates from a gap between stocks' return and mutual funds' return of the same stocks that stems from the managerial skills and expenses of companies. Thus, Statman and Glushkov use SRI indices instead of mutual funds. (Statman, and Glushkov 2009.) Also, Sauer (1997) mentions that index, such as the DSI (Domini Social Index), does not include transaction costs, management fees, or investment policy changes. Schröder (2007) presents similar explanations why to use SRI indices instead of funds in his research. His argument of the advantage of using indices is avoiding transaction costs which appear when using funds. There is not a need to consider the fund manager's skills when investing in indices, and lastly, investors do not need to consider the fund management's or market timing activities either. That leads to a relative direct investigation of the performance of socially responsible investing without any additional contributing factor. (Schröder 2007.)

## 2.5. SRI strategies

There is not only one way or strategy how to invest socially responsible. This chapter goes through some basic investment strategies that many investors use in their operations.

Baker and Nofsinger (2012) argue that the oldest screening strategy is negative screening. The second major screening process is positive screening (Baker and Nofsinger 2012). Negative screening excludes certain types of "sin stocks" of an SRI portfolio, such as stocks of companies from alcohol, tobacco, gambling, nuclear power, animal testing, and genetically modified organisms fields. In positive screening, a portfolio includes stocks of companies with positive scores of social responsibilities. In positive screening, an investor makes investing decisions and selects securities based on the positive characteristics. Those characteristics involve, for example, diversity, community improvement, environment issues, such as recycling and pollution prevention, and quality products. (Baker and Nofsinger 2012; Humphrey and Tan 2014.) According to Auer (2016), his examination results suggest that investors should choose negative screening instead of positive because

positive screening can have an adverse impact on portfolio performance. He explains that simple negative screens exclude unrated stocks which lead to higher performance than a passive strategy as a benchmark. (Auer 2016.) Copp, Kremmer, and Roca (2010) explain as a third screening strategy passive screening. That means passive investing in portfolios that are constructed of socially responsible companies and products (Copp et al. 2010).

Schueth (2003) expresses three investing strategies to make money but also affect society. The ideas of the strategies are listed here. The first strategy is 'Screening' in which an investor includes or excludes companies from his portfolio depending his social and environmental criteria as is mentioned above. The idea is to invest in companies that make positive contributions to society and additionally are profitable. The second strategy is 'Shareholder advocacy'. It describes the actions of socially aware investors in which they take a role to try to affect positively corporate behavior by having a connection with the companies. The aim is to improve the well-being of the company's stakeholders and stockholders, and it is believed to develop the financial performance of the company over time. The third strategy is 'Community investing'. This investing strategy provides capital to people who do not have a high income, and for risky communities who do not get capital via conventional channels. Many social investors invest a small part of their investments to Community Development Financial Institutions (in the U.S.) which helps communities in a lower state of society. (Schueth 2003.) These strategies are aimed to provide for an investor both profit and socially good conscience.

Kempf and Osthoff (2007) test whether socially responsible investing yields abnormal returns compared to conventional investing. They make a strategy where they form two portfolios of stocks that are rated to high and low SRI rates. Their main criteria are the environment, community, employee relations, diversity, human rights, and product, and they use the period 1992-2004. The basic idea of the strategy is: "*buy stocks with high SRI ratings and sell stocks with low SRI ratings*". This strategy finds high abnormal returns, up to 8.7% per annum. (Kempf and Osthoff 2007.)

## 2.6. The Financial crisis

The global financial crisis arose in September 2008 when the investment bank Lehman Brothers went bankrupt. The panic spread fast and caused mistrust on the solvency and liquidity of financial institutions. (Ivashina and Scharfstein 2010.) Banks' liquidity dried up during the crisis due to freezing of interbank markets and collapse of markets of asset-backed and mortgage-backed securities that led to problems and failures in banks (Cornett, McNutt, Strahan, and Tehranian 2011). According to Sapienza and Zingales (2012), the financial crisis originated from a fall in trust. They investigate how much American people trust other people or institutions during 17–28 of December 2008. They find out that the most trustworthy people were other people. Bankers and the government were less trustworthy, and the stock market was the least trustworthy. (Sapienza et al. 2012.)

The financial crisis of 2008–2009, at the latest, brought out the importance of the social responsibility of firms. Lins et al. (2017) investigate the impacts of the crisis on firm performance when social responsibility has been taken into account. During the crisis time, public trust in institutions, companies and capital markets decreased suddenly. They find that high CSR firms outperform the lower CSR firms during the crisis. They made another interesting finding about the people trusting. The firm's excess return is higher in regions where both firm's headquarters is located, and individuals are more trusting. Lins et al. (2017) also talk about social capital and trust during the market downturn, the financial crisis 2008–2009 as an example. They argue that the trust between a company and its investors and stakeholders pays off when a negative shock hits the overall trust level in corporations and markets. The trust between a company and its investors and stakeholders has been built by investing in the firm-specific social capital and CSR activities. Investments in social capital during the market crisis period can be seen as an insurance policy of a company. (Lins et al. 2017.)

Lins et al. (2017) investigate what the mechanisms behind the high-CSR companies' outperformance are. They find that companies with high-CSR activities also experience higher sales growth and sales per employee and have better profitability and gross margin compared to other companies during the financial crisis. (Lins et al. 2017.) Nofsinger and Varma (2014) agree with Lins et al. (2017) findings that SRI investing endure better during market crisis times. They argue that the nature of SRI and ESG weakens the adverse risk.

They say firms that execute environmental, social and governance (ESG) responsibility have a smaller risk to experience negative ESG events during both bullish and bearish market times. For example, companies with strong environmental green programs are less likely to face disastrous pollution events. (Nofsinger and Varma 2014.) These examples show that social responsibility and CSR have an essential impact during the crisis and therefore the Financial crisis is one of the examination periods in this thesis.

### 3. LITERATURE REVIEW

The interest and knowledge of socially responsible investing have increased rapidly recently which has also raised the number of studies of the topic. However, the studies have not found one unambiguous result but various different results from underperforming to outperforming of the benchmark and no significant differences have been found in the studies. This section takes an overview of the remarkable literature and goes through different results of the studies. The chapter has divided into four smaller chapters that go through first positive performance, neutral performance, and negative performance of SRI investing, and the last section discusses the criticism that SRI has faced.

#### 3.1. Positive performance

Hill et al. (2007) investigate the performance of the SR mutual fund portfolios compared to the stock markets' returns in the U.S., Europe, and Asia using the Jensen's Alpha. They find that SR fund portfolios outperform their comparison equity markets in the long term period (i.e., 10 years) in the U.S. and Europe but during the short term the outperformance was significant only on the European portfolios. (Hill et al. 2007.) Consistently with Hill et al. (2007), Statman and Glushkov (2009) find also a socially responsible portfolio yielding higher returns compared to a conventional portfolio. Their result is consistent with their hypothesis "doing good while doing well". They used socially responsible rated stocks from 1992 to 2007, and the stocks were expected to earn higher returns than conventional stocks. (Statman, and Glushkov 2009.)

Auer (2016) uses ESG scores from a new European dataset to find out whether it is possible to earn a higher return from socially responsible investing. His examination period is 2004-2012, and he uses the Sharpe ratio primarily. Consistently with other studies, he finds the significantly higher performance of the socially responsible investing compared to the conventional benchmark when he uses a negative screening strategy excluding unrated stocks from the portfolio. (Auer 2016.) Derwall, Guenster, Bauer, and Koedijk (2005) also find that a stock portfolio of "most eco-efficient" companies is outperforming compared to a less eco-efficient portfolio during the period 1995-2003.

Nofsinger and Varma (2014) investigate the performance of the US SRI mutual funds and matched conventional mutual funds during crisis and non-crisis periods on 2000–2011. They find 1.61–1.70% annualized outperformance of SRI funds during crisis periods (Nofsinger and Varma 2014). According to Chan and Walter (2014), the long-term investing in environmentally-friendly companies outperform approximately by 7% per annum using Carhart (1997) four-factor model. They investigate environmentally-friendly companies listed on the U.S. stock exchanges between 1990 and 2012 (Chan and Walter 2014). In addition, Henke (2016) investigates the performance of SRI bond funds in the U.S. and Europe during 2001–2014. Along with other studies, he finds outperformance of the SRI bond funds. The outperformance during the crisis period is 0.77–0.92% for the European sample and 0.65–0.74% for the U.S. sample. (Henke 2016.)

Eccles et al. (2014) investigate companies' performance when companies have been divided into *high sustainability* and *low sustainability* categories. The categories are constructed by firms' environmental and social approaches. They use the four-factor model for 18 years and find the high sustainability companies outperforming the low sustainability companies by 4.8% annually. (Eccles et al. 2014.)

### 3.2. Neutral performance

Already in 1978, Alexander and Buchholz examined the relation between social responsibility and stock market performance, and they did not find any significant relationship between them. In addition, they did not find a significant relation between social responsibility and stock risk level (Alexander and Buchholz 1978). Later, some studies found results of the same type as previous ones. Li et al. (2010) do not find any significant difference in the risk-adjusted return between SRI and non-SRI indices in the long run. They test the financial performance of the seven U.S. SRI indices and their benchmarks during the period 2001-2009 using the Sharpe ratio. (Li et al. 2010). Moreover, Bello's (2005) findings verify the result that there is no significant difference between socially responsible and conventional funds. He investigates whether socially responsible funds outperform the conventional funds during the period of 1994-2001 using among others the Jensen's alpha and the Sharpe ratio. (Bello 2005.) Schröder (2007) tests 29 international SRI equity indices

performance to their conventional benchmark indices, and he neither finds significant outperforming nor underperforming between the indices.

Hamilton et al. (1993) also investigate whether socially responsible mutual funds earn excess return compared to conventional mutual funds using Jensen's alpha. They do not find significantly different performance between SR and conventional funds. (Hamilton et al. 1993.) Shank, Manullang, and Hill (2005) find similar results as Hamilton et al. by examining the return of socially responsible funds using Jensen's alpha, but they do not find any significant excess performance comparing the SR funds to the NYSE Composite Index.

Statman (2006) does not find a significant difference between returns of socially responsible indices and their conventional benchmark either. He uses four different SR indices and compares them to the S&P500 index during the period 1990-2004. (Statman 2006.) Cortez et al. (2009) also investigate the performance of socially responsible funds, but in Europe instead of the U.S. However, they do not find any significant difference between the socially responsible funds and conventional counterpart portfolios. (Cortez et al. 2009.) Leite and Cortez (2015) examine the performance of French socially responsible investment funds in Europe during the market downturn and normal-time. They find a neutral performance of SRI funds compared to conventional funds (Leite and Cortez 2015). Moreover, Humphrey and Tan (2014) examine the impacts of positive and negative screening on the SRI funds' performance and risk in respect of unscreened portfolios. They do not find any difference on risk or return between positive or negative screening and unscreened portfolios which means that investors do not gain any benefit or face any harm investing in SRI funds (Humphrey and Tan 2014).

### 3.3. Negative performance

Interestingly, also a negative performance of the SR investing has been found even if many studies are finding the positive and neutral performance of similar examinations as mentioned above. For example, Renneboog et al. (2008b) find a negative result when they test SRI funds' performance to their conventional benchmarks. Their research finds 2,2%–6,5% underperformance when they compare SRI funds to their benchmarks in the U.S., the UK, and in many continental European and Asia-Pacific countries (Renneboog et al. 2008b).

To continuing the previous section, Leite and Cortez (2015) find significant underperformance of SRI funds compared to conventional characteristics-matched funds during the normal market time in their study. Also, interestingly, during a good economic time, they find also significant underperformance of SRI funds when the strategy of funds is a negative screening strategy. Leite and Cortez (2015) mention that their findings suggest that investors may have to pay the price for ethics when investing in socially responsibly during normal market time. (Leite and Cortez 2015.) Moreover, Nofsinger and Varma (2014) find 0.67–0.95% annualized underperformance of conventional funds compared to the U.S. SRI funds during a non-crisis period.

Hong and Kacperczyk (2009) investigate the performance of investing in “sin” stocks – publicly traded companies that do business with alcohol, tobacco and gaming products. They find outperforming of a portfolio of sin stocks on the period of 1965-2006. (Hong and Kacperczyk 2009.) This finding quarrels with the common thought of socially responsible investing in which the purpose is to avoid the sin stocks. Thus, this finding shows the negative performance in this thesis.

Belghitar, Clark, and Deshmukh (2014) examine whether there is a cost for the investor when investing ethically. They use FTSE4Good U.S., U.K., Europe and Global indices and conventional index from the same area. They find neither outperformance nor underperformance when investing socially responsibly, but their findings suggest that there is a financial price to be paid when using an SRI index. Moreover, they suggest that risk averse investors reduce SR investments if they want to enhance their expected utility of the investments. (Belghitar et al. 2014.) These findings support the negative performance of socially responsible investing.

### 3.4. Criticism

Of course, ambiguous concepts get many kinds of views and have to face counterarguments and criticism. Here are some critical arguments of social responsibility. For instance, Fowler and Hope (2007) criticise an exploration of sustainable indices and their performance. Their reasons for the criticism are a short history of indices, and the complication of indices’

comparison which stems from the differences of size, country, and industry weightings in indices. (Fowler and Hope 2007.) Lee, Humphrey, Benson, and Ahn (2010) argue that non-financial factors of investments in socially responsible funds restrict investment opportunities, decrease diversification effectivity and thus have adverse effects on performance that may also be the most common cause for the criticism of socially responsible investment funds. Barnett and Salomon (2006) mention a little bit different view of critics of corporate social responsibility. They argue that it is expensive and administratively troublesome for a firm to initiate into socially responsible practices (Barnett and Salomon 2006).

Devinney (2009) argues that there is only little if any evidence about the fact that more social activities in a company would increase its social level, and furthermore, the activities can be socially harmful. For example, Devinney (2009) tells a few examples that support his arguments. He explains that some resources firms continuously get a high grade of social responsibility surveys because they have to follow GRI (Global Reporting Initiative) standards and consequently they are considered to be environmentally responsible. However, Devinney continues that extreme environmental groups are vilifying and boycotting the firms due to the firms' impacts on the environment. Another example is about a cosmetic firm that engages in limited animal testing but at the same time owns another cosmetic company that is well-known of its animal-friendly orientation. (Devinney 2009.) The conflict between these two cosmetic firms is apparent and can be fallacious if the investor does not know the real facts behind the firms.

## 4. THEORETICAL BACKGROUND

This chapter provides a theoretical background of this thesis. The efficient market hypothesis and portfolio theory that give a clear explanation of the market and its functionality are explained. However, socially responsible investing is more complex and may not follow those fundamental theories perfectly. Also, this chapter will explain the methods that are used in this thesis in the empirical part.

### 4.1. Efficient market hypothesis

The efficient market hypothesis is one of the most famous investment theories in finance whereby security prices reflect all available information from the market. The “efficient market” is an ideal situation in which an investor can choose securities which prices fully represent the firm’s activities. Fama (1970) bases the efficient market hypothesis on three assumptions to ensure the operability of the hypothesis. The first assumption is that transaction costs do not exist in security trading. The second point is that all market participants have freely the same possibility for all available information. The third assumption is that all market participants agree with the information and how the information affects the current and future price of each security. (Fama 1970.)

The theory expresses three different forms of how efficiently information reflects on the market’s stock prices. These forms are weak, semi-strong, and strong forms. In the ‘weak form’, a stock price reflects all the information that is already available of the stock’s past performance. The ‘semi-strong form’ includes the weak-form and additionally considers other publicly available information of company and stocks such as announcements of annual reports, stock splits or other corporate activities. The last form ‘strong form’ includes all the previous information and in addition, all inside information of a company that is not publicly available for everyone. (Fama 1970.)

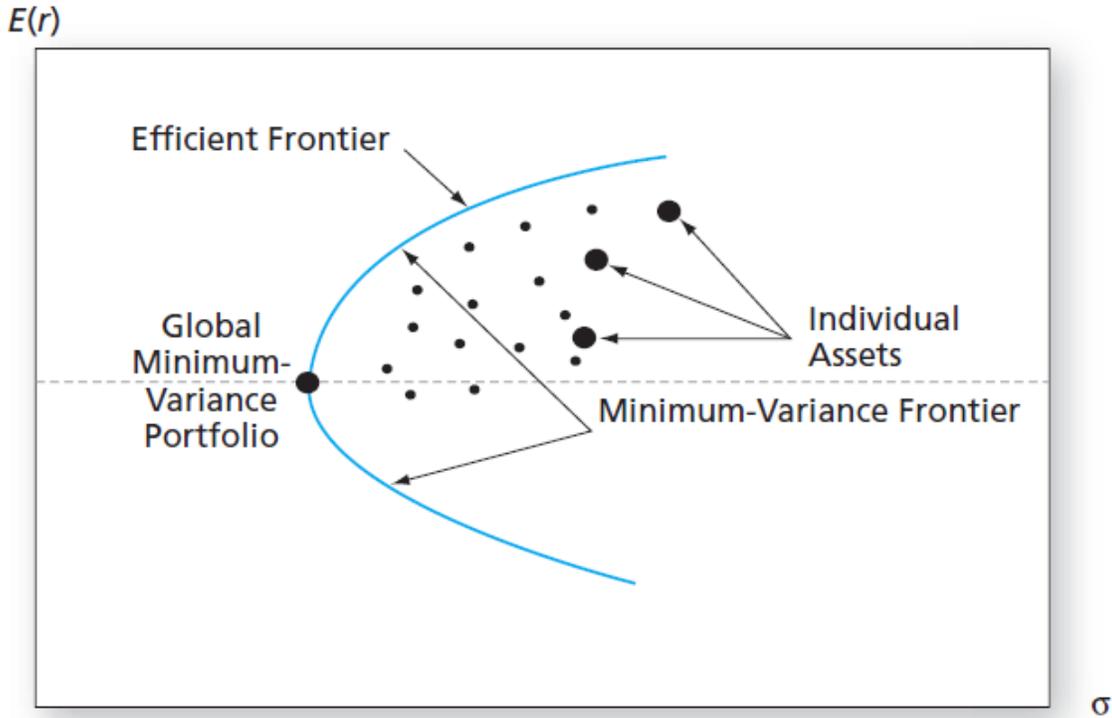
However, in the real world, the efficient market hypothesis not always exists as we can see of the assumptions above. The latest Financial crisis is a good example which shows that the efficient market hypothesis is not flawless theory and the theory has lost its advocacy.

Moreover, investors have succeeded to find higher returns than other securities or market, and for instance, the SRI aims to find outperformance compared to their benchmarks. Theoretically, an excess return is impossible by the efficient market hypothesis. The hypothesis is a good baseline for the more in-depth examinations of the market's operation.

#### 4.2. Portfolio theory

Portfolio theory by Harry Markowitz (1952) is an investment theory whereby an investor can construct the most efficient investment portfolio by maximizing the expected return at the specific level of market risk. The risk decreases when investing in more different securities. An idea behind the principle is that at any risk level, investors seek only the highest expected return for a portfolio (Bodie et al. 2014: 222).

An ideal risk-return combination for an asset is on an 'efficient frontier'. Figure 2 shows the minimum-variance frontier of risky assets and the efficient frontier which illustrates the most efficient risk-return combinations for an asset. Asset's variance has to be above 'Global Minimum-Variance Portfolio' -point so that an investment is rational, based on that the variance would be the lowest possible and the return is as high as possible. (Bodie et al. 2014: 220.)



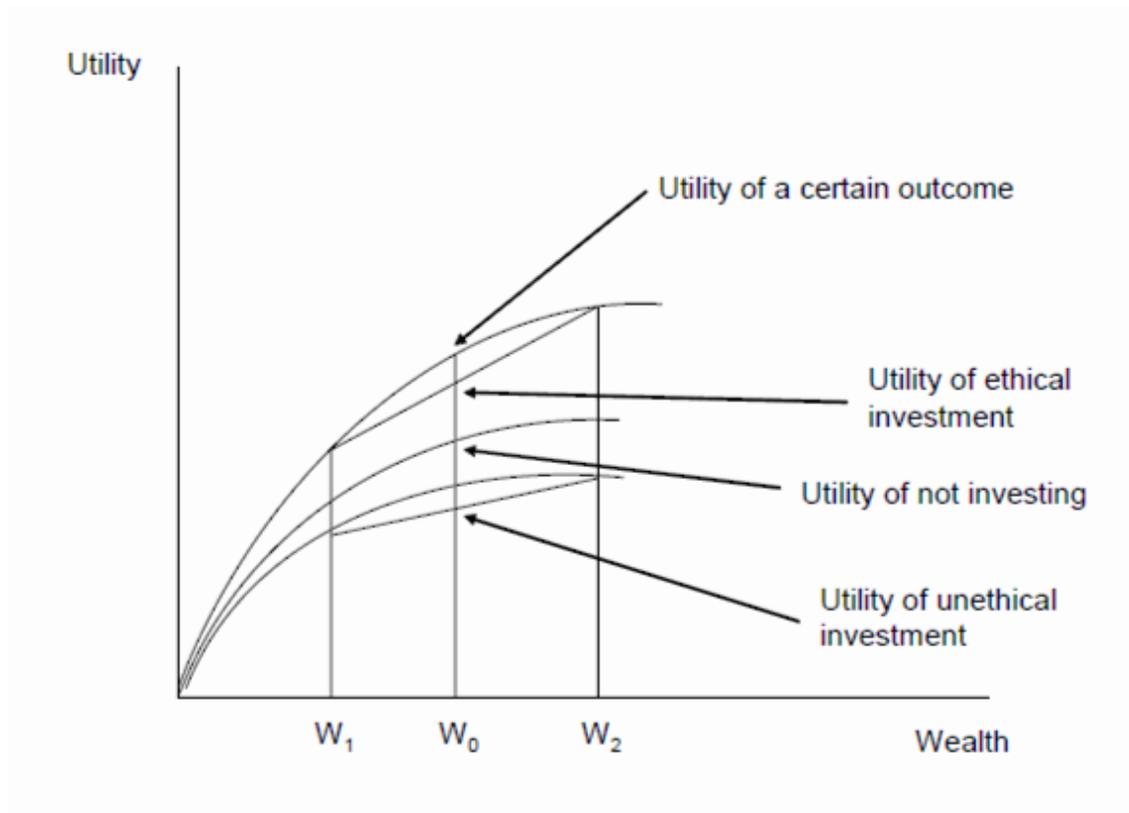
**Figure 2.** The minimum-variance frontier of risky assets (Bodie et al. 2014: 220).

An optimal portfolio will lie on the minimum-variance frontier, upward from the point of global minimum-variance portfolio and will give the best combinations of risk and return. If a portfolio lies on the minimum variance frontier below the global minimum variance portfolio point, there is always a portfolio with the same variance and higher expected return which makes the first portfolio inefficient. Thus, the downside of the minimum-variance frontier is inefficient. (Bodie et al. 2014: 220.)

Socially responsible investing is limited to a smaller pool of investment opportunities due to its aim to select only certain responsible securities to the portfolio, and thus the SRI investments' possibility to be a well-diversified portfolio decreases (Barnett and Salomon 2006). This argument expresses the fact that an SRI portfolio may not be the most efficient portfolio and may not lie on the efficient frontier.

### 4.3. Ethical investment utility

Beal, Goyen, and Phillips (2005) explain SR or ethical investors demand to seek non-wealth returns, contribution to social change as well as better financial returns as about it has been discussed earlier in this thesis. SR or ethical investor get more than financial return, and that additional return is called as a utility of ethical investment. (Beal et al. 2005.)



**Figure 3.** Ethical Investor's Utility Function (Beal et al. 2005).

Figure 3 shows that an investor with its initial wealth level  $W_0$  will get either wealth level  $W_2$  or  $W_1$  depending on the profitability of the investment. The horizontal axis represents wealth. The utility that the investor achieves from the investment depends on the quality of the investment, whether the investment is seen as sustainable and ethical or unsustainable and unethical. The ethical investor will receive less utility if his investment is not ethical than if he would not invest altogether. That can be seen in Figure 3 of the line 'Utility of not investing' when it is above the line 'Utility of unethical investment'. The vertical axis is the

utility. Moreover, the investor derives more utility if he invests ethically than avoiding the investment. That can be seen when ‘Utility of ethical investment’ line is above the line without investing. Another interesting implication of the model is that the investor gains more utility of the investment when the initial investment is smaller. (Beal et al. 2005.)

Beal et al. (2005) adjust the utility function in the explanation of the ethical investment utility. The utility function is often used in modern finance theory, and it includes two functions: expected return and risk. The function measures the standard deviation of the possible difference between expected investment results and actual investment outcomes. The following equation represents the utility function: (Beal et al. 2005)

$$(1) \quad U = f(E_R, \sigma_R)$$

where:

$U$  = utility

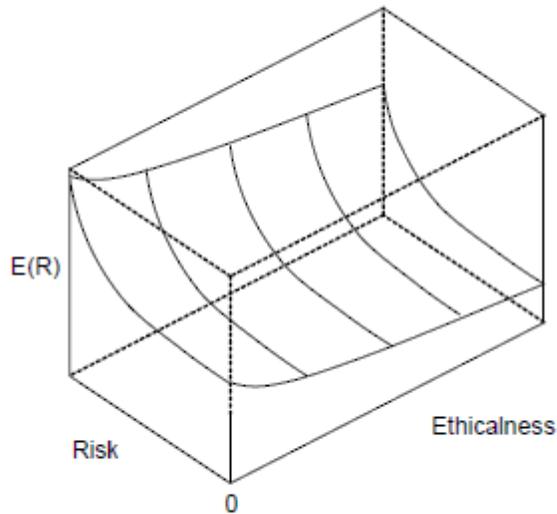
$E_r$  = expected return

$\sigma_R$  = risk i.e. standard deviation

Due to the modern finance theory fundamental assumption of investor’s expectations, an investor likes expected return and dislike risk. Therefore, the expected return has a positive impact on utility and standard deviation has a negative impact. To apply this utility function to ethical investment, an additional factor will be added to the utility function above. This factor can be called ‘degree of ethicalness’, and it is denoted an  $e$  in the function:

$$(2) \quad U = f(E_R, \sigma_R, e)$$

In the conventional investment, investor demands compensation for the taken additional risk of investment. In the ethical investment, and investor is willing to accept a reduced expected return in this model. However, all ethical investors may not accept this diminishing. Figure 4 presents the indifference plane of an ethical investor which means different states that ethical investor is willing to accept. (Bear et al. 2005.)



**Figure 4.** Indifference Plane of an Ethical Investor (Beal et al. 2005).

#### 4.4. Sharpe Ratio

William Sharpe (1966) created a measure to calculate the risk-return relation of a portfolio. The measure is very well-known in the finance world. The Sharpe ratio is a ratio that measures a portfolio's excess return in relation to a portfolio's standard deviation of excess return. The ratio tells how much portfolio yields in relation to its risk. (Bodie et al. 2014: 840.)

The model is following:

$$(3) \quad \text{Sharpe Ratio} = \frac{R_p - R_f}{\sigma_p}$$

where:

$R_p$  = portfolio return

$R_f$  = risk-free rate

$\sigma_p$  = standard deviation of portfolio's excess return

Schröder (2007) measures Sharpe ratio using the annualized mean logarithmic return of investment ( $\mu_i$ ) instead of portfolio return ( $R_p$ ). Also, the used standard deviation is calculated of investment's logarithmic return.

#### 4.5. Treynor Ratio

The Treynor ratio is a similar measure as the Sharpe ratio to calculate risk-return relation. The difference from the Sharpe ratio, the risk of the Treynor ratio is systematic risk, i.e. market risk instead of total risk of a portfolio. The measure calculates average excess return related to the market risk. (Bodie et al. 2014: 840.)

The model is following:

$$(4) \quad \textit{Treynor Ratio} = \frac{\bar{R}_p - \bar{R}_f}{\beta_p}$$

where:

$\bar{R}_p$  = average portfolio return

$\bar{R}_f$  = average risk-free rate

$\beta_p$  = beta, i.e. systematic risk, of a portfolio

#### 4.6. Capital Asset Pricing Model

The Capital Asset Pricing Model (CAPM) is one of the most famous and fundamental models in modern finance. The CAP-model is developed by Sharpe (1964), Lintner (1965), and Mossin (1966). The model expresses an expected return of a risky asset. The CAPM is based on Markowitz (1952) Portfolio theory, and several market assumptions are set to simplify the usage of the model. (Bodie et al. 2014: 291; Zabarankin, Pavlikov and Uryasev 2014.)

The model is following:

$$(5) \quad E(r_i) = r_f + \beta_i[E(r_M) - r_f]$$

where,

$E(r_i)$  = expected return of an asset

$r_f$  = risk-free return

$\beta_i$  = asset's  $i$  risk

$E(r_M)$  = expected market return

$[E(r_M) - r_f]$  = market risk premium

(Bodie et al. 2014: 291–297.)

A CAP-model based single index-model measures performance for instance of an ethical fund. The intercept of a model, alpha  $\alpha_i$ , measures the performance between the fund and its benchmark such as market by telling out- or underperformance of relation. The alpha,  $\alpha_i$ , is known as a Jensen's alpha created by Michael Jensen 1968. (Bauer, Koedijk and Otten 2005.) The model can be presented as follows:

$$(6) \quad R_i - R_f = \alpha_i - \beta_i * (R_m - R_f)$$

where,

$R_i$  = a realized return of a security or portfolio

$R_f$  = a risk-free rate of return for the period

$R_m$  = a realized return of the market portfolio

$\beta$  = a systematic risk

(Jensen 1968; Bauer et al. 2005.)

Schröder (2007) mentions that most studies' common measure of performance is Jensen's alpha. It is used as a constant of a regression model with one or more factors to explain the returns of a fund or other securities or portfolio (Schröder 2007). For example, Hamilton et al. (1993) also use Jensen's Alpha to measure the excess return of mutual funds. Moreover, Shank et al. (2005) use Jensen's Alpha to investigate fund performance and excess returns.

#### 4.7. Fama and French three-factor model

Fama and French three-factor model is an asset pricing model that expands the CAP-model by adding the size and value factors after the market risk factor. The size factor of the model is “Small-minus-big” (SMB), also called “size effect”, which explains the return of a portfolio consisting of companies that have small market capitalization and large market capitalization. The idea of the size factor is that small-cap stocks tend to outperform the large-cap stocks. The value factor is “High-minus-low” (HML) that represents the return spread between value (high book-to-market ratio) and growth (low book-to-market ratio) companies. Value stocks tend to outperform growth stocks. (Fama and French 1993.)

The model is following:

$$(7) \quad R_{it} - R_{Ft} = a_i + b_i(R_{Mt} - R_{Ft}) + s_iSMB_t + h_iHML_t + e_{it}$$

where:

$R_{it} - R_{Ft}$  = excess return of a portfolio

$R_{Mt} - R_{Ft}$  = excess return of a market portfolio

$SMB_t$  = return difference between the small and large stock portfolios

$HML_t$  = return difference between the high book-to-market and low book-to-market stock portfolios

(Fama and French 1993.)

## 5. DATA AND METHODOLOGY

This chapter presents the data and the methodology used in the thesis. The chapter goes through which indices are used and how they are constructed. In addition, the chapter shows the descriptive statistics of the data and what is expected of the empirical results of the thesis when certain methods and data are used.

### 5.1. Data and descriptive statistics

The data of the thesis consists of daily closing prices of six market indices. Indices comprise four SRI indices and two benchmark indices that are MSCI KLD 400 Social, Calvert Social, Stoxx Europe Sustainability, DJSI Europe, S&P 500, and Stoxx Europe 600 indices. Half of the indices concentrate on the U.S. and half on Europe, and thus one of the benchmark indices is placed in the U.S. and another in Europe. The U.S. and Europe are the first areas where SRI indices were initiated what is why these indices are used in this study. The data has been collected from Thomson Reuters database.

MSCI KLD 400 Social Index is combined of the U.S. securities that weights companies that have great ratings in Environmental, Social and Governance (ESG) sectors and excludes companies that have negative impacts on social and environmental fields. Companies are from different business fields, such as from Information Technology, Communication Services, Health Care, and Industrials. (MSCI 2019b.) Calver Social Index is composed of the large and mid-capitalization companies which practice Calvert's sustainability criteria and are listed on the NYSE or NASDAQ exchanges. One of the Calvert's criteria is that if a company is listed on more than one exchange, the company will be considered case-by-case. They exclude, for instance, securities that are not common equity issues, such as, convertible notes and warrants, companies which ownership is 75% or more by another company, real estate investment fund, and foreign issues unless listed only on a U.S. exchange. (Calvert Investment 2016.) Stoxx Europe Sustainability index includes the European top ESG leaders from 17 European countries. Companies with positive sustainability ratings are selected to the index from the Stoxx Europe 600 index. The sustainability rate is positive if it is consistent with the requirements of Bank Sarasin Sustainability Matrix. (STOXX 2019.)

DJSI Europe index comprises the largest 600 European companies in the sustainability field that fill economic, environmental and social criteria identified by RobecoSAM. It includes companies from 14 countries and different business sectors, such as consumer staples, financials, health care, and industrials. (S&P Dow Jones Indices 2019.) The Standard & Poor's (S&P) 500 index represents the 500 largest U.S. companies that are publicly traded. The companies are valued by market-capitalization. S&P 500 index represents a benchmark index to the SRI indices used here. Correspondingly in Europe, the benchmark index is Stoxx Europe 600. It represents companies with large, mid and small capitalization among 17 European countries.

Figure 5 presents the MSCI KLD 400 Social Index and S&P500 Index progression from 1990 until 2018. As an example, the figure shows clearly that the social index either has beaten or gone with the S&P500 index during the whole time period. In addition, the figure shows the sharp decline of the indices during the financial crisis 2008-2009. However, during almost 30 years, both indices have greatly progressed in their entirety.



Sources: MSCI, S&P  
Note: Indexed to 100.

**Figure 5.** MSCI KLD 400 Social Index and S&P500 Index comparison (Bloomberg 2018).

The data begins 1<sup>st</sup> of October 2001 when all the indices used were available, and it ends on the 31<sup>st</sup> of October 2018 with the exception of Calvert Social Index which ends on the 19<sup>th</sup> of June 2015. Calvert Social Index has changed its name and modified the content, and that is the reason why it is not suitable to use the compensatory index for the remaining time period of Calvert Social index. The data consists of the full time period and three split time periods due to the market's movements. The target is to see the effects of significant market movements in SRI indices. The Pre-crisis period starts on the 1<sup>st</sup> of October 2001 and lasts until the end of July 2008. The Crisis-period begins on the 1<sup>st</sup> of August 2008 and lasts until the 31<sup>st</sup> of March 2009. The Post-crisis period is from the 1<sup>st</sup> of April 2009 until 31<sup>st</sup> of October 2018. The definition of the Crisis-period is based on the study of Lins et al. (2017) in which Lehman Brothers' bankruptcy defines the start of the crisis, and the crisis ends when the S&P500 index hits the lowest point of the crisis.

**Table 1.** Descriptive statistics of logarithmic returns of the SRI price indices.

	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Observations
<b>S&amp;P500</b>	0,00021	0,00031	0,10957	-0,09470	0,01160	-0,26467	13,34476	4486
<b>STOXX Europe 600</b>	0,00010	0,00029	0,10626	-0,10187	0,01343	-0,18858	10,57951	4486
<b>MSCI KLD 400 Social</b>	0,00021	0,00022	0,10380	-0,09353	0,01157	-0,18422	12,18959	4486
<b>Calvert Social</b>	0,00022	0,00038	0,10379	-0,09864	0,01277	-0,16531	11,20214	3580
<b>DJSI Europe</b>	0,00008	0,00032	0,10461	-0,09933	0,01383	-0,17159	10,30487	4486
<b>STOXX Europe Sustainability</b>	0,00010	0,00025	0,10640	-0,09974	0,01356	-0,17991	10,51462	4486

Table 1 performs the descriptive statistics of the data of the thesis. It shows mean, median, maximum and minimum values, standard deviation, skewness, kurtosis, and the number of observations of each index. The observations of Calvert Social index are smaller than others because the index ended in 2015. All results are around the same value in each class. The U.S. indices indicate to have a higher mean (0,00021–0,00022) than European indices (0,00008–0,00010). In addition, the U.S. indices' standard deviations are smaller (0,01157–0,01277) than those of European indices (0,01343–0,01383). All the indices are negatively

skewed, and their kurtosis are relatively high (up to 13,34) which indicates that the indices are not normally distributed.

## 5.2. Methodology

The main tools to measure the performance of SRI indices and their benchmarks are the CAPM and Fama-French three-factor model. The models are widely used to measure the performance of socially responsible investments (see the studies of Derwall et al. 2005, Renneboog et al. 2008b, Statman and Glushkov 2009, Cortez et al. 2009, and Nofsinger and Varma 2014) lending support to use similar methods in this thesis. Furthermore, the Sharpe and Treynor ratios are also used as risk adjusted measures in the thesis. The target of the ratios is to show the risk-return relation of the indices examined in the thesis. For example, Li et al. (2010) and Auer (2016), use the Sharpe ratio to measure the performance of SRI investments in their studies.

In this study, the data consists of daily prices of indices, and the SRI indices are compared to regional benchmarks meaning that the S&P500 index is used in the U.S. and Stoxx Europe 600 index is utilized for the European SRI indices. All the measures are tested for the whole sample period and for three shorter sample periods which illustrates the time before the Financial crisis, the time during the crisis, and the time after the crisis.

## 5.3. Expected results

As previous academic literature shows, results of socially responsible investing do not give unambiguous and obvious results of the investments. They may yield both outperformance and underperformance, and in addition, neither out- nor underperformance results have been found when there is a comparison to conventional investments. For instance, Renneboog et al. (2008b) and Leite and Cortez (2015) find negative results when investing in SRI funds, Li et al. (2010) and Bello (2005) do not find a significant difference between socially responsible investing and conventional investing, and in addition, Statman and Glushkov (2009) and Derwall et al. (2005) find outperformance of SR-investments in relation to conventional investing.

The expected results of the thesis are based on Chan and Walter (2014) study in which they find outperformance of environmentally-friendly firms compared to a benchmark sample during the period 1990-2012. The period 1990-2012 includes pre-crisis, crisis and part of the post-crisis period of this study which shows that outperforming is possible to gain from the whole sample period. As Chan and Walter (2014) find outperformance, this thesis also expects to find higher returns of SRI indices compared to their conventional indices. Also, the expectation for the crisis period performance is similar that for the whole sample period. The expectation is based on studies of Nofsinger and Varma (2014) and Henke (2016) who find outperformance of SRI funds compared to conventional benchmarks during the crisis. The thesis expects the SRI indices to find higher returns than conventional indices during the Financial crisis 2008-2009. The idea behind the expectation is that the socially responsible indices endure better the damages of the crisis due to the quality of the SRI indices.

## 6. EMPIRICAL RESULTS

This chapter examines the findings of the empirical tests. The first part expresses the results of the risk-adjusted performance metrics Sharpe and Treynor ratios. Second, the Capital Asset Pricing Model results are reviewed. After the CAPM findings, the Fama-French three-factor model is examined. All the metrics measure the full period and three divided periods of the full sample so that different market conditions can be investigated. That gives more comprehensive results of the whole sample period for the thesis. The results are discussed in this chapter after each table and in the analysis part.

### 6.1. Sharpe and Treynor ratios results

**Table 2.** Sharpe ratio results.

	<b>Full Period</b>	<b>Pre-Crisis</b>	<b>Crisis Period</b>	<b>Post-Crisis</b>
<b>S&amp;P 500 COMPOSITE</b>	0,169	0,033	-1,001	0,697
<b>STOXX EUROPE 600</b>	0,017	0,371	-1,203	0,145
<b>MSCI KLD 400 SOCIAL</b>	0,173	0,008	-0,942	0,689
<b>CALVERT SOCIAL (CSI)</b>	0,168	-0,013	-0,967	0,985
<b>DJSI EUROPE</b>	-0,008	0,262	-1,189	0,159
<b>STOXX EUROPE SUSTAINABILITY</b>	0,010	0,270	-1,195	0,195

Table 2 presents the results of Sharpe ratio calculations for all the indices used in the thesis, calculated for the whole sample period and for three shorter periods that represents different time periods of the Financial crisis. The results represent the relation between the excess return of an index and its volatility, and a higher Sharpe ratio illustrates a better risk-adjusted return. The full period gives for the U.S. SRI indices and S&P500 benchmark index nearly the same results (0,168–0,173) but in Europe, the benchmark index Stoxx Europe 600 got a higher Sharpe ratio (0,017) than the European SRI indices (-0,008–0,010). That means that

MSCI KLD 400 social index performs slightly better than the S&P500 benchmark index, but in Europe, the benchmark index beat the SRI indices. In addition, all the U.S. indices got higher results than the comparable European indices, so the risk-adjusted performance is better in the U.S. than in Europe by analysing these results in the observation. However, on the pre-crisis period, the European indices beat the U.S. indices (0,262–0,371 in Europe and -0,013–0,033 in the U.S.), and both benchmark indices get higher results than the correspond SRI indices. Not surprisingly, all results from the crisis period are negative, but interestingly, the SRI indices yield slightly better than the benchmarks. This observation supports the argument that SRI indices are safer investment objects than conventional correspondings during the financial crisis. After the crisis, European SRI indices yield better than their benchmark index (0,159–0,195 vs. 0,145) and so does the Calvert social index from the U.S. (0,985 vs. 0,697). That indicates that also after the crisis, three of four SRI indices yield a higher risk-adjusted return than their benchmarks. The U.S. indices yield the absolutely best results after the financial crisis, and the European indices before the crisis. However, all the results of all time periods are below one which indicates a weak performance with respect to volatility.

**Table 3.** Treynor ratio results.

	<b>Full Period</b>	<b>Pre-Crisis</b>	<b>Crisis Period</b>	<b>Post-Crisis</b>
<b>S&amp;P 500 COMPOSITE</b>	0,043	0,016	-0,514	0,118
<b>STOXX EUROPE 600</b>	0,015	0,079	-0,629	0,040
<b>MSCI KLD 400 SOCIAL</b>	0,044	0,012	-0,485	0,118
<b>CALVERT SOCIAL (CSI)</b>	0,044	0,008	-0,500	0,173
<b>DJSI EUROPE</b>	0,009	0,059	-0,624	0,043
<b>STOXX EUROPE SUSTAINABILITY</b>	0,013	0,061	-0,627	0,050

Table 3 presents the results of the Treynor ratio calculations. The Treynor ratio is a similar type of performance metric as the Sharpe ratio, but the excess return of an investment is divided by the beta of the investment, in other words by the systematic risk, whereas the Sharpe ratio uses the total risk in the ratio. The results are similar to the results of the Sharpe

ratio. For the whole sample period, the results from the U.S. both SRI indices and benchmark have almost the same result (0,043-0,044), and in Europe, the benchmark index yields slightly better results than the SRI indices (0,015 vs. 0,009-0,013). During the pre-crisis period, both benchmark indices yield better results than their corresponding SRI indices. As does the Sharpe ratio, also the Treynor ratio yields negative results during the Financial crisis period, and the SRI indices yield slightly less negative results than their benchmarks. These findings also support the argument that the SRI indices would perform better during the financial crisis. After the crisis, the SRI indices yield better results (0,043-0,05 in Europe, 0,118-0,173 in the U.S.) than their benchmark (0,040 and 0,118) except the MSCI KLD 400 Social index that gets the same result as the S&P500 index. The results after the crisis are similar to the results of the Sharpe ratio. European SRI indices and Calvert Social index yield higher results than their benchmark, and MSCI KLD 400 index yields same than its benchmark S&P500 index.

## 6.2. CAPM results

**Table 4.** CAPM model results.

Full Period	$\alpha_i$	$r_{mt} - r_{ft}$	$R^2$
<b>MSCI KLD 400 SOCIAL</b>	-0,0000 (0,1729)	0,9933*** (0,0000)	0,9885
<b>CALVERT SOCIAL (CSI)</b>	0,0001*** (0,0001)	1,0218*** (0,0000)	0,9830
<b>STOXX EUROPE SUSTAINABILITY</b>	0,0000 (0,5809)	1,0049*** (0,0000)	0,9924
<b>DJSI EUROPE</b>	0,0001** (0,0447)	1,0175*** (0,0000)	0,9866
Pre-Crisis	$\alpha_i$	$r_{mt} - r_{ft}$	$R^2$
<b>MSCI KLD 400 SOCIAL</b>	0,0000 (0,5535)	1,0042*** (0,0000)	0,9859
<b>CALVERT SOCIAL (CSI)</b>	0,0003*** (0,0000)	1,0369*** (0,0000)	0,9748
<b>STOXX EUROPE SUSTAINABILITY</b>	0,0002*** (0,0000)	1,0275*** (0,0000)	0,9907
<b>DJSI EUROPE</b>	0,0003*** (0,0001)	1,0314*** (0,0000)	0,9758
Crisis-Period	$\alpha_i$	$r_{mt} - r_{ft}$	$R^2$
<b>MSCI KLD 400 SOCIAL</b>	0,0002 (0,4630)	0,9771*** (0,0000)	0,9907
<b>CALVERT SOCIAL (CSI)</b>	0,0001 (0,7013)	1,0055*** (0,0000)	0,9867
<b>STOXX EUROPE SUSTAINABILITY</b>	0,0000 (0,9532)	1,0093*** (0,0000)	0,9935
<b>DJSI EUROPE</b>	0,0000 (0,8632)	1,0190*** (0,0000)	0,9929
Post-Crisis	$\alpha_i$	$r_{mt} - r_{ft}$	$R^2$
<b>MSCI KLD 400 SOCIAL</b>	-0,0000 (0,5486)	0,9903*** (0,0000)	0,9854
<b>CALVERT SOCIAL (CSI)</b>	0,0001* (0,0911)	1,0224*** (0,0000)	0,9842
<b>STOXX EUROPE SUSTAINABILITY</b>	0,0000 (0,3911)	0,9828*** (0,0000)	0,9923
<b>DJSI EUROPE</b>	0,0000 (0,6715)	1,0082*** (0,0000)	0,9898

This table presents regression results of the Capital asset pricing model of all SRI indices in relation to their regional benchmark indices. Asterisks \*\*\*, \*\*, and \* represent significance levels of 1%, 5%, and 10% respectively. P-values of statistical significance are in parentheses.

Table 4 shows the results of the capital asset pricing model (CAPM) regression calculated for the full sample period and three divided periods: pre-crisis, crisis, and post-crisis. MSCI KLD 400 Social and Calvert Social indices are regressed against their benchmark S&P500 index, and Stoxx Europe Sustainability and DJSI Europe indices are regressed against their benchmark index Stoxx Europe 600. The results are regressed of daily logarithmic returns of indices.

The results of the CAPM performance are mainly positive. MSCI KLD 400 index is an only index that yields negative alpha but only on the post-crisis period, and consequently, also on the full period. In addition, for the full period, two of four alphas of the SRI indices, Calvert Social and DJSI Europe, are positive (both 0,0001) and statistically significant at 1% and 5% levels respectively. Stoxx Europe Sustainability yields positive but insignificant alpha, and MSCI KLD 400 Social index yields negative and insignificant alpha during the full period. Positive and statistically significant alpha indicates better performance of SRI indices compared to their benchmarks. The alphas are calculated from the logarithmic daily returns, and thus the results are presented as daily logarithmic returns. All the market factors, i.e. betas, are also statistically significant at 1% level for the full period, and three of four betas are over one which means that the risk level of SRI indices is higher than the risk level of their benchmark indices. The results of R-squared for the full period are high and close to one (0,9830–0,9924) which indicates that the variation of SRI indices can be explained almost perfectly by the regional benchmark indices.

The whole sample is also divided into three different crisis periods. CAP-model results of the pre-crisis period show the positive performance of SRI indices in relation to their benchmarks. This positivity indicates that the SRI indices outperform their benchmark indices. Three of four pre-crisis alphas are positive (0,0002–0,0003) and statistically significant at 1% level. MSCI KLD 400 Social index yield positive but insignificant alpha on the pre-crisis period. The betas of the SRI indices during the pre-crisis period are also statistically significant and slightly more than one (1,0042–1,0369). Moreover, the results of R-squared of the SRI indices on the pre-crisis period are close to one.

The crisis-period shows different results than the pre-crisis period. All alphas are positive or zero but statistically highly insignificant which means that the outperforming of SRI indices is not significant during the crisis. The market factors of SRI indices are statistically

significant at 1% level, and three of the four market factors are more than one. That indicates that three of four SRI indices are riskier than their benchmark indices during the crisis. Also, the explanatory powers are very close to one of all the SRI indices.

After the crisis, only Calvert Social index yields positive and statistically significant alpha (0,0001) at 10% level. Two of three other alphas are positive but very close to zero, and the last alpha is negative but close to zero, but they all are statistically insignificant. Therefore, only the Calvert Social index outperforms the benchmark index significantly after the financial crisis. All the betas are statistically significant at 1% level, but for the MSCI KLD 400 Social index and Stoxx Europe Sustainability index the betas are slightly less than one which indicates that their risk levels are lower than the risks of their benchmark indices. All the R-squared of the post-crisis period are very close to one which indicates a good explanation of SRI indices by the benchmark indices.

## 6.3. Fama and French three-factor model results

**Table 5.** Fama-French three-factor model results.

Full Period	$\alpha_i$	$r_{mt} - r_f$	SMB	HML	$R^2$
<b>MSCI KLD 400 SOCIAL</b>	-0,0000 (0,1617)	0,9939*** (0,0000)	0,0005*** (0,0000)	-0,0004*** (0,0000)	0,9890
<b>CALVERT SOCIAL (CSI)</b>	0,0001*** (0,0004)	1,0211*** (0,0000)	0,0011*** (0,0000)	-0,0002*** (0,0009)	0,9845
<b>STOXX EUROPE SUSTAINABILITY</b>	-0,0001*** (0,0000)	0,9807*** (0,0000)	-0,0010*** (0,0000)	-0,0003*** (0,0000)	0,9934
<b>DJSI EUROPE</b>	-0,0001*** (0,0000)	0,9775*** (0,0000)	-0,0014*** (0,0000)	0,0005*** (0,0000)	0,9886
Pre-Crisis	$\alpha_i$	$r_{mt} - r_f$	SMB	HML	$R^2$
<b>MSCI KLD 400 SOCIAL</b>	0,0000 (0,8849)	1,0021*** (0,0000)	0,0003*** (0,0000)	-0,0004*** (0,0000)	0,9862
<b>CALVERT SOCIAL (CSI)</b>	0,0003*** (0,0000)	1,0314*** (0,0000)	0,0010*** (0,0000)	-0,0012*** (0,0000)	0,9772
<b>STOXX EUROPE SUSTAINABILITY</b>	-0,0002*** (0,0000)	0,9825*** (0,0000)	-0,0015*** (0,0000)	-0,0001 (0,1761)	0,9940
<b>DJSI EUROPE</b>	-0,0002*** (0,0002)	0,9804*** (0,0000)	-0,0017*** (0,0000)	0,0002 (0,2105)	0,9798
Crisis-Period	$\alpha_i$	$r_{mt} - r_f$	SMB	HML	$R^2$
<b>MSCI KLD 400 SOCIAL</b>	0,0002 (0,3107)	0,9676*** (0,0000)	0,0011*** (0,0000)	0,0010*** (0,0000)	0,9927
<b>CALVERT SOCIAL (CSI)</b>	0,0001 (0,5222)	0,9789*** (0,0000)	0,0014*** (0,0000)	0,0022*** (0,0000)	0,9925
<b>STOXX EUROPE SUSTAINABILITY</b>	-0,0002 (0,1718)	0,9610*** (0,0000)	-0,0012*** (0,0000)	0,0021*** (0,0000)	0,9972
<b>DJSI EUROPE</b>	-0,0001 (0,3757)	0,9737*** (0,0000)	-0,0011*** (0,0000)	0,0023*** (0,0000)	0,9970
Post-Crisis	$\alpha_i$	$r_{mt} - r_f$	SMB	HML	$R^2$
<b>MSCI KLD 400 SOCIAL</b>	-0,0000 (0,4376)	0,9904*** (0,0000)	0,0004*** (0,0000)	-0,0006*** (0,0000)	0,9868
<b>CALVERT SOCIAL (CSI)</b>	0,0001* (0,0832)	1,0132*** (0,0000)	0,0010*** (0,0000)	-0,0004*** (0,0000)	0,9864
<b>STOXX EUROPE SUSTAINABILITY</b>	-0,0000 (0,3267)	0,9886*** (0,0000)	-0,0003*** (0,0000)	-0,0007*** (0,0000)	0,9928
<b>DJSI EUROPE</b>	0,0000 (0,9862)	0,9726*** (0,0000)	-0,0012*** (0,0000)	0,0003*** (0,0000)	0,9910

This table presents regression results of the Fama-French three-factor model of all SRI indices in relation to their regional benchmark indices. Asterisks \*\*\*, \*\*, and \* represent significance levels of 1%, 5%, and 10% respectively. P-values of statistical significance are in parentheses.

Table 5 presents the Fama-French three-factor model regression results of the whole research period and of three divided periods concerning the different time periods of the Financial crisis. The results of the SRI indices' performance are mainly positive for the U.S. indices and negative for European indices. A more detailed explanation of the performance will be discussed below.

Investigating the full period, all SRI indices, except Calvert Social, yield slightly negative alpha which indicates worse performance than their benchmark indices. Calvert social index yields positive (0,0001) daily performance compared to its benchmark. All the alphas, except MSCI KLD 400 Social index, are statistically significant at 1% level on the full period. Continuing to the market factor, i.e., beta, all indices, except Calvert Social, have market factor below one (0,9775–0,9939) which denotes that the risk of three SRI indices is lower than their benchmark indices' risk. Calvert Social index's market factor is 1,0211. All the market factors are statistically significant at 1% level. SMB (small-minus-big) factor shows positive results for the U.S. SRI indices but negative for the European SRI indices on the full period which indicates that the U.S. small market capitalization companies yield a higher return than big market capitalization companies and vice versa in European companies. All the SMB factors are statistically significant at 1% level. HML (high-minus-low) factors are all negative and statistically significant except DJSI Europe index which is statistically significant but positive. DJSI Europe is the only index in which high book-to-market, i.e., value, companies yield higher returns than low book-to-market, i.e., growth, companies investigating the full examination period. In the other SRI indices, the growth companies beat the value companies in the performance. R-squared for the full and divided periods are very close to one (0,9772–0,9972) which means that the regression model explains very well the variation of the SRI indices during the whole sample period including the shorter examination periods.

Examining the pre-crisis period similar results can be observed as during the full period. The U.S. SRI indices yield positive alphas, i.e., yield better returns than their benchmark indices, and the European correspondings yield negative alpha. However, only three of four alphas are statistically significant at 1% level, and alpha of MSCI KLD 400 index is statistically insignificant. All market factors are highly statistically significant, and for the U.S. indices they are more than one, and for the European correspondings, they are slightly less than one. That indicates that the U.S. SRI indices are riskier than their benchmark indices and the

European SRI indices have a lower risk than their benchmarks before the crisis. The interpretation of SMB and HML factors for the pre-crisis period is similar than for the full period with the difference that European SRI indices do not have significant HML factors and the absolute results have minor differences.

When considering the crisis-period, changes in the statistical significance of alphas can be mentioned. The U.S. SRI indices yield positive alphas, but European SRI indices yield negative alpha. That indicates that the U.S. SRI indices outperform their benchmark index and the SRI indices in Europe underperform the benchmark during the financial crisis. However, all the alphas are statistically insignificant, and there is no significant out- or underperformance in SRI indices compared to their benchmarks during the crisis, so the results are mostly explained by the factors. Market, SMB and HML factors of all SRI indices are statistically significant at 1% level during the crisis. The market factor of all SRI indices is less than one which denotes that the risk of SRI indices is lower than the risk of benchmark indices during the crisis. A remarkable observation is that the HML-factors are positive during the crisis for all the SRI indices, so the value companies beat the growth companies during the crisis. After the crisis, only Calvert Social index yields a positive and statistically significant alpha at 10% significance level. The market factor is more than one (1,0132) for Calvert social and for other SRI indices the market factor is less than one. The SMB factors yield similar results than in the previous periods. The HML factors are statistically significant and negative except the DJSI Europe index which gets a positive HML factor.

#### 6.4. Analysis of empirical results

Interestingly, the use of the Fama-French three-factor model did not rise the R-squared of the results, but the R-square values are very high already using the CAPM model. In other words, adding more factors did not have an impact on explanatory power. Moreover, the results are very similar regardless of which model is used.

The empirical results of the Fama-French three-factor model show negative HML factor for three of the four SRI indices for the full, pre-crisis, and post-crisis periods. Interestingly, the HML factor is positive for all SRI indices during the crisis. As Bauer et al. (2005) mention, a negative HML factor indicates that a portfolio is constructed by more growth-oriented or

less value-oriented companies. According to the theory of Bauer et al., during the Financial crisis the companies of the SRI indices were more value-companies than growth-companies which may indicate that value-companies would survive better from the crisis and would be a more lasting choice to invest.

The empirical results of the CAPM and Fama-French three-factor models show the great positive performance of SRI indices. Calvert Social index performs most statistically significantly by yielding positive and significant alpha during the full, pre-crisis and post-crisis periods regardless of which model is used. The positive performance of the Calvert Social index is 3,09%–3,49% over the benchmark index annually for the full period depending on the used model and 1,38%–9,5% annually during pre- and post-crisis periods. Interestingly, DJSI Europe performs conflicting results because its alpha is annually 1,47% better than its benchmark's alpha for the full period and 6,83% for the pre-crisis period using CAPM model but the results are negative -3,20% and -6,55% for the corresponding periods using the Fama-French three-factor model.

The hypotheses specified at the beginning of the thesis have been examined by specific quantitative methods in this chapter. The findings are not straightforward and do not give simple answers to the hypotheses. The first hypothesis is the following:  $H_1$ : Socially responsible indices yield better than comparable conventional indices in the long term. Using the CAPM-model to investigate the long term behavior of the SRI indices, Calvert Social and DJSI Europe indices yield better returns than their regional benchmarks. MSCI KLD 400 Social yields slightly negative and Stoxx Europe Sustainability yield slightly positive results, but they are statistically insignificant. A conclusion of the CAPM could be that  $H_1$  is acceptable. However, using the Fama-French three-factor model, the results are different. For the full research period, all SRI indices, except Calvert Social, perform negatively compared to their benchmarks. Three of the four results are statistically significant. Moreover, the results of the Sharpe and Treynor ratios support mainly the view that benchmark indices perform better than the SRI indices in the long term. These conflicting findings are ambiguous, and thus Hypothesis 1 is rejected.

The second hypothesis was defined as follows:  $H_2$ : Socially responsible indices yield better compared to the conventional indices during the financial crisis. Both the CAPM and Fama-French three-factor model examined the crisis period as one subject. The Capital asset pricing

model expresses a slightly positive alpha for the SRI indices, but they are not statistically significant. The Fama-French three-factor model gives different results for the European indices. MSCI KLD 400 Social and Calvert Social perform positively compared to their benchmark, but the European indices Stoxx Europe Sustainability and DJSI Europe are found to have negative alphas. However, all the performance results of the Fama-French three-factor model for the crisis period are statistically insignificant. Moreover, examining the results of the Sharpe and Treynor ratios, their results show slightly more positive results for the SRI indices compared to their conventional benchmarks which support the acceptance of Hypothesis 2. However, an unambiguous result cannot be outlined due to the insignificant results of the performance of the CAPM and the Fama-French three-factor model. Therefore Hypothesis 2 is rejected.

Borgers, Derwall, Koedijk and Ter Horst (2013) state that a significant number of investors believe that corporate stakeholder relations are connected to firm value in a manner that the financial market does not fully understand. They examine whether stakeholder information predicted risk-adjusted returns as a result of errors in expectations of investors. However, the economic logic tells that increased attention to information that has a significant impact on the value of security or portfolio diminish possible mispricing and makes mispricing short-lived. Borgers et al. (2013) build a stakeholder-relations index (SI) to investigate the answer to their research question, and they come to the conclusion that there are significant results from a stakeholder-relations index generating risk-adjusted returns but only until 2004. The results are not significant from 2004 till 2009 as their research period ends which indicates the information spread of stakeholder issues. (Borgers et al. 2013.) Moreover, Bebchuk, Cohen, and Wang (2013) investigate a similar topic as Borgers et al. by examining the correlation between abnormal return and governance indices, that have been built of several firms in several provisions. They investigate the correlation from the 1990s and notice that the correlation disappears after year 2000. The examination period lasts until 2008. The disappearance of correlation results from the market participants' learning of differences between good-governance and poor-governance companies. (Bebchuk et al. 2013.)

Bebchuk et al. (2013) come to a similar conclusion about the abnormal return disappearance after the market participants get more information about a company's governance and its stakeholder relations. They both find that the vanishing of abnormal return happens in the beginning of 2000s. These findings of Borgers et al. (2013) and Bebchuk et al. (2013) support

the findings of this thesis. Both models, CAPM and Fama-French three-factor model, yield mostly the only significant abnormal returns during the pre-crisis period 2001–2008. After the pre-crisis period, there are almost none significant alphas in the results of the models. Only one SRI index yields significant alpha on 10% level on both models on the post-crisis period. These findings of the thesis are in line with Borgers et al. (2013) and Bebchuk et al. (2013) findings, and therefore the lack of significance of the result of CAPM and Fama-French three-factor model might be a result from the same reason as of the mentioned studies. Based on Borgers et al. (2013) and Bebchuk et al. (2013) studies, this insignificance could be a result from the increase of investors knowledge and learning of socially responsible and ethical investing and firm values of SR indices whereupon more investors know the same things of the SRI investing and consequently the mispricing vanishes. Borgers et al. (2013) conclude their findings that investors have empirical bases for incorporating stakeholder issues in investment decisions if those investors target both financial and social goals. However, Borgers et al. (2013) add, that the possibly emerged abnormal return that is a result of stakeholder information does not remain in the long term. Possibly due to this explanation, also the results of the CAPM and Fama-French three-factor model of this thesis do not yield significant abnormal returns after the pre-crisis period.

By examining the results of the CAPM and Fama-French three-factor model can be noticed that if alpha of the SRI index is positive and statistically significant, its market factor is more than one, so the SRI index is riskier than its benchmark index. Similarly, if the result of alpha of the SRI index is statistically significant but negative, so the SRI index is underperforming the benchmark, and its market factor is less than one which indicates a lower risk than its benchmark's risk. That might be a result of the central learning of finance that the higher taken risk is expected to yield a higher result. However, results are not always as simple as an analysis above might imply.

Analysing the results of the Fama-French three-factor model can be found that during the crisis the market factors, i.e., betas, are less than one, so the risk of SRI indices is lower than their benchmarks. That may indicate that during the crisis the SRI indices would be a safer investment target than their conventional benchmarks. This argument can be supported by Nofsinger and Varma (2014) as they discuss why SRI investing has become more popular, and they end up to an assumption that companies are less risky during market crisis time if they have positive socially responsible attributes. In addition to the result analysis, the HML

factors yield positive results for all SRI indices during the crisis that indicates that activity of the SRI indices is based on the value companies of SRI indices because they perform better than growth companies during the crisis according to the results of Fama-French three-factor model. However, the results of the Fama-French three-factor model are not similar to the CAPM of which the results show that three of four SRI indices are riskier than their benchmarks during the crisis. Only one SRI index has a lower beta than one during the crisis.

## 7. CONCLUSIONS

Socially responsible investing and other related terms have rapidly risen their popularity recently. People are aware of climate change, global warming, ethical issues, and healthier lifestyles. Due to this change in the world, also the finance world is heading to more sustainable solutions. Thus, the purpose of this thesis is to examine does it matter whether investor invests in a socially responsible way or not. More precisely, this thesis investigates whether it is possible to find abnormal returns by invest in socially responsible indices compared to conventional benchmark indices. The thesis concentrates on indices so that the results would be as genuine as possible, and they are not confounded by expenses and skills.

The quantity of SRI investing had widened dramatically during the past decades as can be observed from the US SIF Foundation (2018) fact that the investments by SRI strategies have been made \$12 trillion in the U.S. at the end of 2017 when the amount was only \$639 billion in 1995. Moreover, the amount of socially responsible studies indicates that the topic has interested researchers. Many recent studies (see Hill et al. 2007; Statman and Glushkov 2009; Eccles et al. 2014; Auer 2016) find positive impacts by investing socially responsibly, but there are also recently made studies (see Bello 2005; Renneboog et al. 2008b; Li et al. 2010; Leite and Cortez 2015) that find negative impacts of similar kind of investigations. These findings show that this topic is not unambiguous and therefore the aim of the thesis is to make more investigation of the topic. Additionally, this thesis examines the effects of the market downturn on socially responsible and conventional indices, because previously, some studies (Nofsinger and Varma 2014; Henke 2016) have been found better performance of SRI investments compared to conventional investments during the market downturn. The Financial crisis of 2008-2009 is an evidence of market downturn in the thesis.

The socially responsible investing has been spread firstly in the U.S. and then to Europe. Those areas are mostly examined in other studies and this is the reason why both the U.S. and Europe are in a consideration. The results of the U.S. and Europe differ somewhat between each other. According to the Fama-French three-factor model and the results of alpha, the European SRI indices perform negatively in respect of their benchmarks whereas the U.S. SRI indices yield positive performance in respect of their benchmark during the pre-crisis and crisis periods. The U.S. MSCI KLD 400 Social index yields negative alpha after

the crisis and thus its alpha of the full period is also negative. Also, one of two European SRI indices (DJSI Europe) yields positive alpha after the crisis, so the results vary between the periods. Furthermore, the SMB factor presents clear difference between the U.S. and Europe. The European SRI indices yield negative SMB factor whereas the U.S. SRI indices yield positive SMB factor for all examination periods. According to the CAPM, a similar observation cannot be found, and the performance results are mainly positive for both the U.S. and Europe SRI indices using the CAPM.

The Financial crisis 2008-2009 is an evidence of the market downturn for the thesis, and it gives interesting observations for the analysis. The second hypothesis took the financial crisis into the examination. There are signs of SRI indices' outperformance during the financial crisis, but there are also contrary signs in the outcomes, and moreover, many of the results are statistically insignificant. Therefore, the precise results of the effects of the Financial crisis cannot be stated. Also, the first hypothesis, considering the long term period, gets conflicting results depending on the used model, and thus the first hypothesis cannot be accepted. The significant results have mainly found during the pre-crisis period 2001-2008, and these findings mostly drive the significance for the full period of the examination.

Undoubtedly, this topic will rise its favour in the near future, and more research will be done on the topic. In addition, the topic probably rises its favour overall in the finance world and makes it more important among investors. The climate change, global warming, oceans pollution, and other similar environmental issues have risen to common matters among people, and those issues will definitely have significant impacts on the economy and investment in general. The investigation of SRI indices is a relatively new matter so more research is needed of the topic so that more explicit results can be stated.

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