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**USING ESG DISCLOSURE SCORE AS AN INVESTMENT TOOL –
EVIDENCE FROM FINNISH STOCK MARKET**

Master's Thesis in
Accounting and Finance
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ABSTRACT

The concept of socially responsible investing has increased rapidly over the past two decades as the investors are demanding such practices and the company's ecological, social and governance issues are capturing more media coverage. The purpose of this thesis is to study the effect of company's ESG disclosure score on its performance. ESG disclosure score measures the amount of information disclosed by company on ecological, social and governance issues.

This thesis is conducted using a data of daily stock returns from Finnish stock exchange between the years 2006 and 2016. Companies from Helsinki stock exchange are divided into two equally-weighted portfolios using ESG disclosure score provided by Bloomberg as a divider. ESG portfolio includes companies that disclose some of the ESG information while non-ESG portfolio includes company with no ESG disclosure score. The portfolios are rebalanced after each year based on the changes in ESG disclosure score.

Results suggest that the usage of company's ESG disclosure score as an investment screen does not lead to a significant over or underperformance. Furthermore, neither of the sample portfolios are able to create positive alphas during the sample period. Difference between the performances of the two portfolios are explained through exposure to market risk. The performance of the sample portfolios is also tested against different market conditions by dividing the sample period into crisis and non-crisis periods. Evidence from the thesis indicates that ESG portfolio generates positive alphas during the non-crisis period and negative alphas during market turmoil while the opposite is true for the non-ESG portfolio. While the portfolios are able to generate positive alphas during different market conditions, neither are statistically significant. Furthermore, evidence from the analysis of different market conditions indicate that non-ESG portfolio includes more defensive stocks as it is able to create positive alphas during market crisis period.

KEYWORDS: Socially responsible investing, ESG, Portfolio performance

1. INTRODUCTION

“The life of money-making is one undertaken under compulsion, and is evidently not the good we are seeking: for it is merely useful and for the sake of something else” (Aristotle 350 B.C.).¹

Textbooks in economics and finance often state that investor’s behavior is driven and based on the maximization of self-interest. However, several studies indicate that there are variety of alternative motives driving investor behavior (Fehr et al. 2000; Bovenberg 2002). Bovenberg (2002) argues that the behavior of corporate stakeholders such as consumers and shareholders may influence corporations to take public goods, for example, environment, into more consideration even if this does not have a direct benefit for the corporations. Additionally, Beal, Goyen & Phillips (2005) name non-wealth returns and contribution to social change as an alternative reasons for investors besides achieving superior financial returns, stating that investors are willing to pay extra for ethical options. However, a belief that choosing socially responsible firms to investment portfolio or leaving out stocks that are morally dubious or unethical, will generate superior returns, is the number one motivation behind investing responsibly (Beal et al. 2005).

Using different social and ethical screens or taking corporation’s governance issues into consideration while doing investment decisions falls under the category of socially responsible investment, SRI. The popularity of SRI has grown exponentially over the past two decades amongst individual investors, which, in part, has increased the number of SRI funds available. Report conducted by the Forum of Sustainable and Responsible Investment (2012) states that the total net asset value of socially responsible investment funds exceeded 1,000 billion dollars in 2012 while the number was 12 billion in 1995. As the industry of socially responsible investments is growing rapidly, academic researched has followed. The performance measurements of socially responsible investing have been thoroughly investigated in academic research from various perspectives. Most studies focus on the performance of SRI funds but research on the stock level has also been conducted including the opposite side of the coin of socially responsible investing, sin stocks. Conclusive evidence on the effects of SRI on fund performance has yet to be made. Various studies find that the performance of SRI funds is not significantly different

¹ Aristotle’s Nicomachean Ethics (2010).

from conventional funds (Hamilton, Jo & Statman 1993; Goldreyer & Diltz 1999; Bello 2005).

In contrast to the research stating that using different socially responsible screens has no statistically significant impact on portfolio performance, several studies document results that using criteria that narrows the investment universe will cause the portfolio to underperform and limit its diversification (Diltz 1995; Grossman & Sharpe 1986; Hall 1986). In addition, according to Rudd (1981), the portfolio performance will suffer through socially responsible investing because restraining companies will create size and other biases, hence affecting the long-term performance. Most of the previous research on socially responsible investing conclude that the differences between SRI funds and conventional funds are statistically insignificant or skew on conventional funds' favor. However, there are several studies that document the outperformance of SRI funds. Derwall, Guenster, Bauer & Koedijk (2005) state that using SRI-related screens leads to an outperformance that is statistically significant. Additionally, Bauer, Koedijk & Otten (2005) found similar results on the outperformance achieved by ranking companies on their eco-efficiency rating. Bauer et al. (2005) state that companies with higher rating performed significantly better than low-ranked companies.

It is easy to conclude that the research on the performance of socially responsible investing is ambiguous at best. One possible reason behind the elusiveness of the results is the different methodology used in the studies. The performance measurements vary from using capital asset pricing model and Jensen's alpha (Hamilton, Jo & Statman 1993) to more advanced methods such as Carhart's (1997) four factor model (Bauer et al. 2005). Furthermore, substantial part of research is conducted using individual countries and relatively small sample periods which makes international comparison of SRI performance more difficult (Renneboog, Horst & Zhang 2008). Regardless of differences in methods and sample periods, SRI is an interesting, relatively fresh and rapidly growing part of modern finance offering a number of topics for further research.

1.1. Purpose of the study

The purpose of the study is to examine the effect of ESG screen on portfolio performance. The study aims to make a contribution to the existing literature on socially responsible investments by studying the effect of ESG disclosure score on portfolio performance. ESG disclosure score measures the amount of information covered by companies on

ecological, social and governance issues. The score varies between 0 (no information covered) and 100 (all the possible information covered) and it is maintained by Bloomberg. Furthermore, the study contributes to the existing literature by expanding the data to post financial crisis period and measuring the impact of different market conditions on the performance of socially responsible investment strategy. As most of the previous research is conducted using data from United States or other larger economies, the study seeks to provide different perspective by using data from Finnish stock market, hence contributing to the research already conducted in the University of Vaasa.

In addition to the research contribution, the purpose of the study is to offer thorough review on the previous literature and research on socially responsible investing by covering the main results and contributions. Additionally, the purpose of the thesis is to analyze the results and to combine it with the existing literature.

1.2. Hypotheses

Hypotheses of the study are derived from the existing research in socially responsible investments. As mentioned above, most of the studies find that using ESG screens will cause funds to underperform or the effect is statistically insignificant. Only few studies document positive effects on the performance. First hypothesis of the thesis is derived from the basis that screens on ecological, social and governance issues have negative impact on portfolio performance. Hypothesis is based on the work of Girard, Rahman and Stone (2007) where they investigate the total cost of social constrains in investment decision.

H1: Using ESG disclosure score as a screen has a negative impact on portfolio performance.

Second hypothesis takes the performance measurements further and seeks to analyze the differences between portfolios conducted using Bloomberg's ESG disclosure score as a differentiator. The motivation behind second hypothesis is from the research of Renneboog et al. (2008) where they investigate the performance of socially responsible investment funds. Renneboog et al. (2008) hypothesize that consideration of ethical, social and governance issues in investment decisions influence the stock price leading investors to pay the price for using SRI screens. Additionally, Renneboog et al. (2008)

find that SRI funds underperform their benchmark portfolios in most of the developed countries such as United States and United Kingdom.

H2: Companies with no ESG disclosure score outperform their socially responsible counterparts.

The third hypothesis is based on the work of Nofsinger et al. (2014) where they state that socially responsible mutual funds outperform conventional funds during market turmoil but underperform during non-crisis periods. The third hypothesis is tested by dividing the sample period in crisis and non-crisis periods and it goes as follows:

H3: ESG portfolio outperforms the non-ESG portfolio during market crisis periods.

The three hypotheses are tested using research methodology from the study conducted by Schröder (2007). The results are then analyzed and discussed in length using above-mentioned research as a baseline.

1.3. Structure of the thesis

The study is formed in the following manner. Second chapter covers the SRI as a concept by going through its history and presenting alternative socially responsible investment strategies. Also the concept of ‘Sin stock’ is visited briefly. Third chapter concentrates on the theoretical background the study is based on. Efficient market hypothesis is explained and portfolio performance measures are introduced. Fourth chapter goes through the previous literature in length by introducing the main results on SRI focusing on the performance measures between conventional and SRI funds. Fifth chapter introduces the data used in the thesis and presents key figures related to the ESG disclosure score. Sixth chapter reveals the methodology behind the research and chapter seven goes through the main results and discussion. The eight and last chapter summarizes the main results and gives the main conclusions.

2. SOCIALLY RESPONSIBLE INVESTING

Socially responsible investing or SRI is increasingly popular amongst individual investors and funds using SRI criteria as an investment tool are growing rapidly. USSIF Foundation (2014) reports that only in the United States, more than \$ 6.57 trillion dollars were invested using SRI strategies. This is more than every sixth dollar under professional management in the United States by the end of 2014. Figure 1 demonstrates the development of SRI assets in billions of dollars in the United States between the years 1995 and 2012. In addition, the growth rate of assets under management increased over 76 per cent between 2012 and 2014 rising from \$3.74 trillion to \$6.57 trillion. (USSIF 2014.)

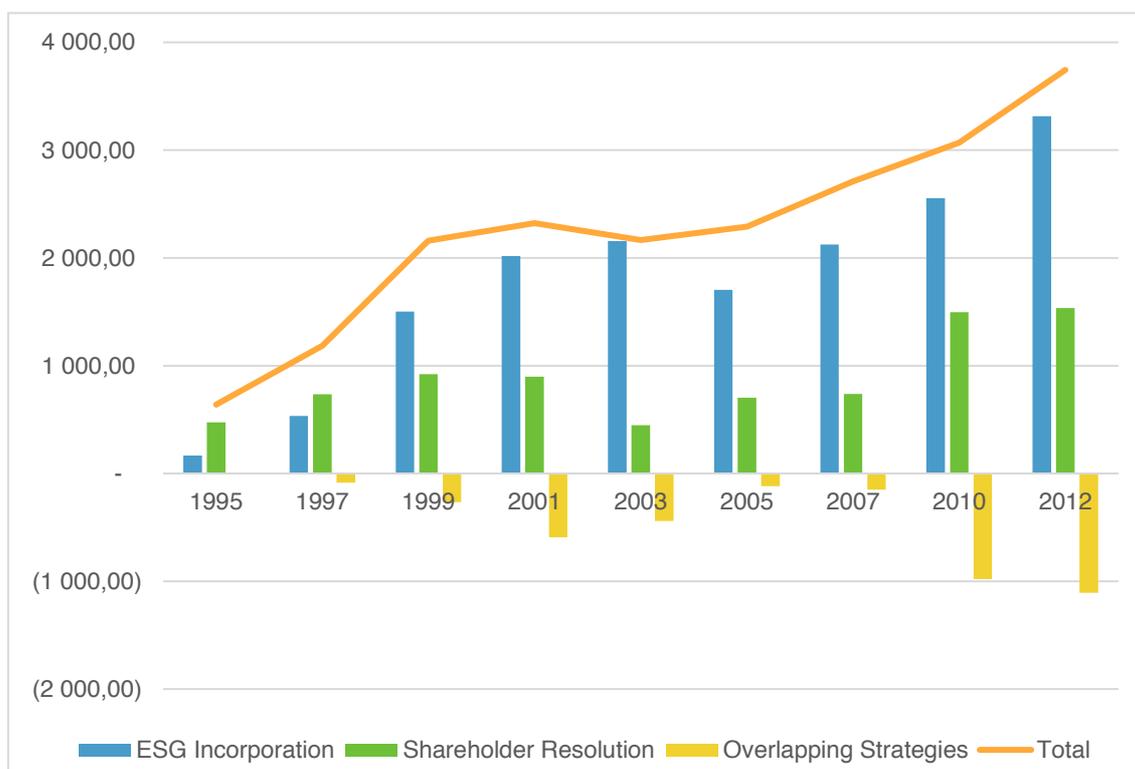


Figure 1. SRI in the United States in 1995 – 2012 (USSIF 2012).

Nofsinger & Varma (2013) state that one of the main reasons behind the rapid growth of SRI-based investment strategies is the individual investor's demand for such practices. Figure 2 demonstrates the growth and popularity of ESG criteria in investment funds which is strongly related to the requirements of the individual investors. Figure shows the number of investment funds using ESG criteria have increased from 55 in 1995 to 720 in

2012. The net asset value of these funds has grown from \$12 billion to \$1,013 billion in the same period. (USSIF 2014.)

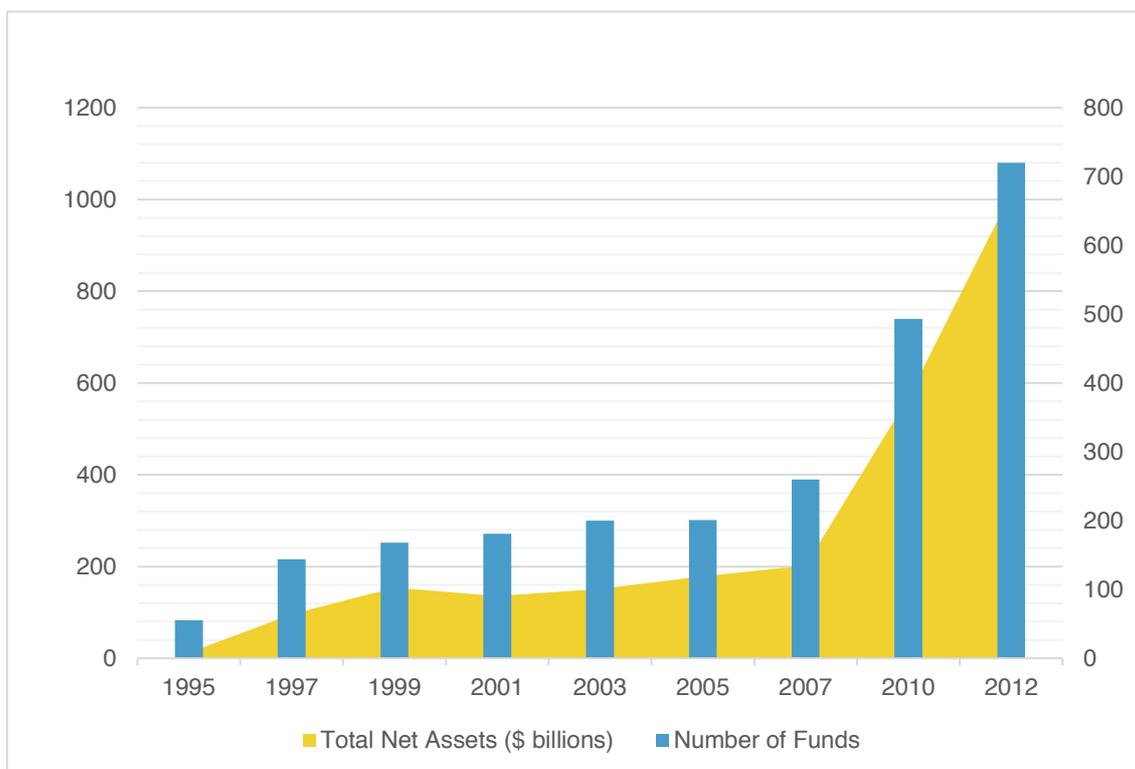


Figure 2. Investment funds incorporating ESG criteria in investment decisions (USSIF 2012).

There are two main motivations behind socially responsible investing. First, the need of an investment strategy that is in line with the personal values, is increasingly popular among investors. This type of investment strategy is often called ‘feel good’ investing and it makes investors feel better about themselves. Another motivational factor behind investing responsibly is the investor’s need to make investments that improve quality of life. These type of investors put their money into strategies that are driven by the goal of social change. (Schueth 2003.) Other reasons behind the increasing popularity of socially responsible investing strategies are strong financial performance, creating environmental benefits, managing risk and preparing for future challenges (USSIF 2014).

There are number of motivational reasons behind socially responsible investing but why has it grown so rapidly in the past two decades? Schueth (2003) argues that the growing popularity of SRI is due to a number of reasons. One of the most important factors contributing to the growing popularity of SRI is information. Nowadays, investors are

better educated and social research organizations are capable of producing high quality information for investors that may affect their investment decisions. Investors tend to make more responsible decision when they are better informed. Another reason for socially responsible investing to grow more rapidly in recent years is the increasing number of women involved in the finance industry. Approximately 60 per cent of socially conscious investors are women. In addition, women do not only contribute to the socially responsible investing through their investment decisions but also because increasing number of women are joining the workforce, MBA programs and board of directors etc. The third reason contributing to the increase of SRI is the fact that investors do not automatically need to sacrifice the performance when investing responsibly. Academic research and the performance of the SR funds have partially broken the myth that socially responsible investing will underperform compared to conventional investment strategies. Growing belief exists amongst socially responsible investors that responsibility and prosperity are not mutually exclusive. (Schueth 2003.)

More concrete evidence of the growing importance of socially responsible investing is the foundation of the *Principles for Responsible Investment*. The PRI was founded by the United Nations in 2005 to help investors use responsible investments to enhance returns and managing risks. PRI is created by a group of institutional investors worldwide to encourage its signatories to invest through responsible principles. PRI has launched six core principles and by implementing them to the investment decisions, investors help to create more sustainable global financial system. (Principles of Responsible Investment 2016.)

1. Incorporate ESG issues into investment analysis and decision-making processes.
2. Be active owners and incorporate ESG issues into our ownership policies and practices.
3. Seek appropriate disclosure on ESG issues by the entities in which we invest.
4. Promote acceptance and implementation of the Principles within the investment industry.
5. Work together to enhance our effectiveness in implementing the Principles.
6. Report on our activities and progress towards implementing the Principles.

The PRI has grown rapidly since its launch in 2005. Figure 3 demonstrates the growth of PRI from 2006 to 2016. The number of signatories who have signed to follow the principles of responsible investing has grown from 100 to 1 500 in a ten year period. Furthermore, the asset under management has increased from 7 to 62 US\$ trillion in the same time period. (Principles of Responsible Investment 2016.)

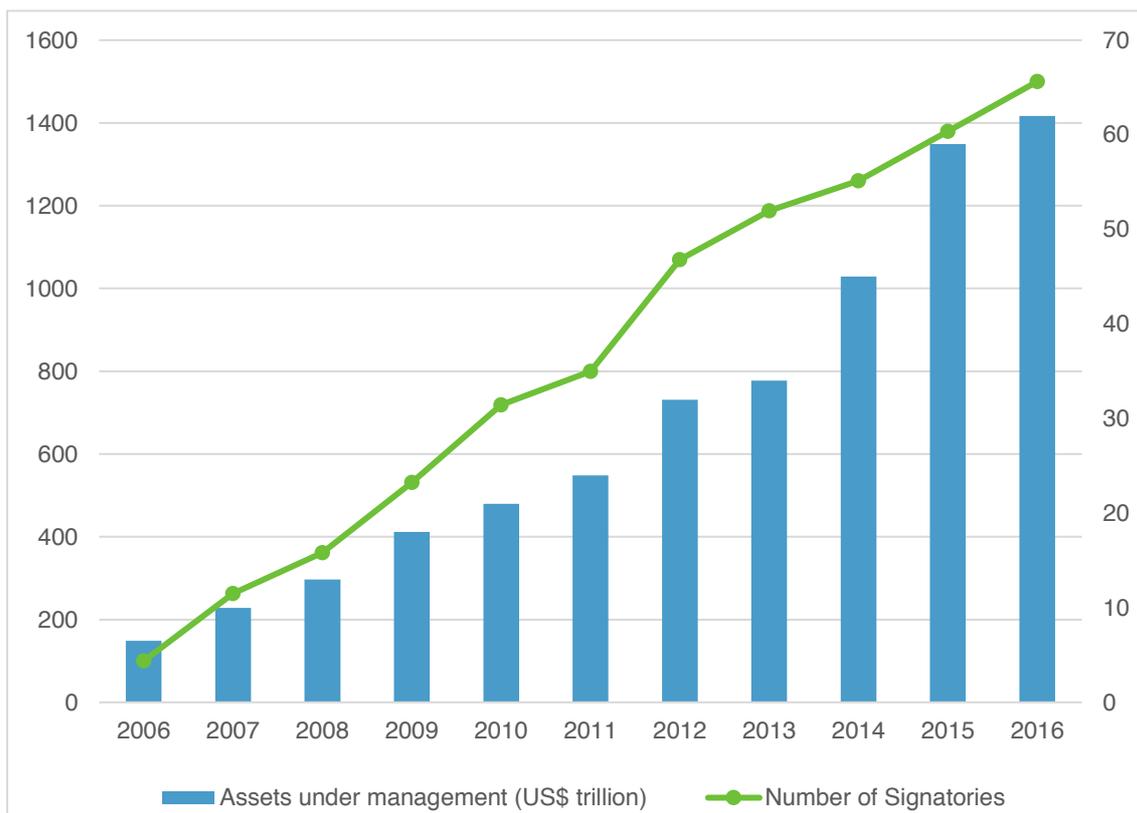


Figure 3. The growth of PRI during the time period of 2006-2016 (Principles of Responsible Investment).

The terminology behind SRI is ambiguous and dependable on the approach to the socially responsible investing. Terms community investing, ethical investing, green investing, impact investing, mission-related investing etc. are all used to describe SRI from a different perspectives.

2.1. History of Socially Responsible Investing

The origins of the SRI dates back in the early stages of civilization. Jewish law defined numerous directives of how to invest ethically. Since then, for generations, religious investors driven by the prospect of peace and prosperity have avoided investing in enterprises linked to killing or enslaving humans. In modern times, these once religious traditions can be seen in the form of avoiding the so called ‘sin stocks’. Sin stock is a stock that is related to morally suspicious industries such as gaming, alcohol or tobacco. (Schueth 2003.)

The modern roots of SRI are political. In the 1960s, social responsibility and accountability was a major concern among public in the United States. This was caused by number of political aspects such as Vietnam War, civil rights, inequality between men and women and the nuclear concerns from 1970s. However, the number of socially responsible investors did not grow rapidly until the 1980s when the racist system of apartheid was widely pressured by different institutions such as cities, states, universities and individual investors. These issues backed with the growing knowledge of dangers related to global warming and ozone depletion are the reasons behind the increasing popularity of socially responsible investment strategies. (Schueth 2003.)

2.3. SRI Strategies

According to Schueth (2003), SRI can be divided into three main strategies: screening, shareholder advocacy and community investing. Within these strategies, socially responsible investors try to integrate their personal values and concerns of society into investment decision (Schueth 2003).

2.3.1. Screening

Screening is based on a strategy where investors are including or excluding companies from their portfolios using criteria that are socially responsible. Main objective is to find profitable companies that are following socially responsible principles and are beneficial to society. This requires investors to perform thorough analysis of company's corporate policies, overall practices and various other criteria to find out if the company is socially responsible. This packed with the analysis of company's profit potential creates the so called double bottom line analysis. This type of analysis often creates portfolios that include companies which have good employer-employee relations and respect towards environment and human rights. Companies with harmful business incentives are avoided. Screening strategy tries to seek the well-managed companies from social perspective keeping in mind that perfect companies do not exist. Main objective is to create a portfolio that satisfies both investor's financial goals and social criteria. (Schueth 2003.)

Socially responsible investors using screens often accept that avoiding companies do not affect the stock prices directly except in extreme situations where, for some reason, the divestment becomes comprehensive in nature. In addition, sometimes social screens are used to avoid conflict of interests. Social investors avoid certain companies or industries

that contradict with the investor's mission, values or principles. For example, it would be unethical for healthcare related institutions to invest in tobacco industry or for religious organizations to buy shares related to weapon industry. (Smith 2005.)

2.3.2. Shareholder Advocacy

As a shareholder, socially responsible investor sometimes raises concern of company's environmental and social issues. This is done by voting and trying to engage on company's decision making process. This strategy is called shareholder advocacy and investors practicing it believe that social awareness in corporate behavior will improve company's financial performance. (Schueth 2003.)

The main tool for investors using shareholder advocacy as an investment strategy is the proxy resolution. Shareholder resolution gives investors a right to demand information or affect company policies. Shareholder resolution is an effective tool for investors to communicate and interact with the company management and other investors with the same investment objectives. There are two main motivations for socially responsible investors to interact with the company through shareholder resolution process. (Smith 2005.)

1. Companies adopting responsible social and governance practices will secure the long-term share owner value.
2. Investors have right and responsibility to interact with the company management and board to guide the company policies towards the long-term interest of the investors.

Socially responsible investors using shareholder advocacy are more concerned about the long term value of the company than its quarterly earnings. Company management and board of directors are facing increasing pressure about their ecological, social and governance practices from shareholders who are concerned of the long term value of their investment. (Smith 2005.)

2.3.3. Community Investing

Community investing is based on an idea of funding people in low-income communities that have problems accessing markets through conventional channels. This type of socially responsible investing mainly focuses on providing housing and developing small businesses in at-risk communities. (Schueth 2003.)

Social investors engaging in community investing often seek opportunities to invest directly to poor communities by buying a certificate of deposit from a bank specialized in community development. In addition, socially responsible investors can influence and fund low-income areas by extending loans in community development loan funds or by making market rate investments in housing of poor areas. (Smith 2005.)

2.4. Sin stocks

At the opposite end of the investment universe lie the sin stocks. Hong and Kacperczyk (2009) define sin stocks as publicly traded companies involved in producing tobacco, alcohol and gambling. These three industries are often called the *triumvirate of sin* because of their tendencies to cause addiction and undesirable social consequences (Hong et al. 2009).

Sin stocks are considered socially unacceptable and therefore their prices could be influenced by the social norms. Hong et al. (2009) provide evidence that socially responsible investing can affect stock prices. The screening strategies of large institutional investors have an impact on sin stocks. By shunning controversial stocks from their investment portfolios, investors are affecting the cost of capital of such companies. (Hong et al. 2009.) Hong et al. (2009) state that social norms and constraints, especially for institutional investors, can cause them to suffer financial losses by avoiding to fund companies related to vice. Willingness to accept financial losses by avoiding sin companies tells the growing importance of socially responsible investing. The performance differences between sin stocks and socially responsible firms has awoken the interest of academic research. Soler-Dominguez and Matallin-Saez (2015) investigate the performance differences between socially responsible mutual funds and the morally controversial VICEX fund. Soler-Dominiguez et al. (2015) state that VICEX fund outperforms socially responsible mutual funds during the periods of market expansion but underperforms during market crisis periods. Additionally, Fabozzi, Ma and Oliphant (2008) document positive excess returns for portfolio constructed from companies in sin industries worldwide. One possible reasons behind excess returns is the economic gain from not having to maintain high standards in responsibility towards society. Another reason behind outperforming the market index comes from the notion that sin stocks are undervalued due to a negative attitudes from certain investor groups. (Fabozzi et al. 2008.)

In contrast to a research of Hong et al. (2009), the sin stocks are often understood in a broader sense than only the triumvirate of sin covering alcohol, tobacco and gambling industries. In addition to these industries, Fabozzi et al. (2008) list industries that can be considered as controversial. Table 1 demonstrates the number of companies and the so called sin industries of 21 countries during the time period from 1970 to 2007.

Table 1. Number of sin companies and industries by country, 1970-2007 (Fabozzi et al. 2008).

Country	Companies	Industry	Companies
Australia	38	Adult services	22
Belgium	5	Alcohol	118
Canada	7	Weapons	21
Denmark	3	Gaming	106
Finland	3	Biotech	19
France	25	Tobacco	22
Germany	5		
Hong Kong	8		
Italy	5		
Japan	41		
Korea	15		
Netherlands	5		
Norway	3		
Portugal	3		
Singapore	3		
Spain	6		
Sweden	6		
Switzerland	2		
Taiwan	1		
United Kingdom	48		
United States	76		
Total	308		308

3. THEORETICAL BACKGROUND

The purpose of this chapter is to cover the theoretical background used in the thesis. Chapter introduces the theoretical framework of efficient market and seeks to connect it with the theory behind socially responsible investing by going through existing literature and methodology.

3.1. Efficient market hypothesis

The theory of efficient market is based on an assumption that prices of securities fully reflect all the available information. However, the efficiency of market can be divided into three different categories based on its effectiveness: strong form, semi-strong form and weak form of efficiency. When the market performs weakly, the prices of the securities only reflect the past returns. Weak form of market efficiency is based on the random walk literature which suggests that the movements of security prices could not be predicted because they are believed to move randomly. The semi-strong form of market efficiency is based on an assumption that prices of securities also reflect the information that is publicly available for all the investors, such as earnings announcements, stock splits or other corporate actions. The situation where prices of securities reflect all the available information, containing both public and non-public information, is called the strong form of market efficiency. Non-public information can be defined as investor's knowledge of a certain company that is not reflected on its price, also known as the insider information. (Fama 1970.)

Since the 1970's the theory of market efficiency has been thoroughly researched and contributions have been made to develop the theory further. Fama (1991) contributes to his original theory by altering the forms of efficient market. Weak form of market efficiency, which is related to the forecasting power of past returns, is modified to cover *return predictability* in wider sense. In addition to past returns, variables such as dividend yields and interest rates are included in forecasting price movements. Additionally, return predictability includes cross-sectional analysis covering asset-pricing models and the effect of anomalies such as *size* and *January effect*. (Fama 1991.)

Fama (1991) suggests that semi-strong form and strong form of efficiency are to be called as *event studies* and *tests for private information* respectively. Event studies have become essential part of modern finance, particularly corporate finance. The purpose of the event

studies related to market efficiency is to study the effect of investment or financing decision on share prices whereas tests for private information investigate the usage of insider information and its effect on stock prices. (Fama 1991.)

3.1.1. Measuring market efficiency

The efficiency of capital markets can be measured with different asset pricing models. Two commonly known models determining the expected return of a security are presented below: Capital Asset Pricing Model (CAPM) and Fama-French three-factor model.

The Capital Asset Pricing Model was created in 1960's and it is still widely used model in the field of finance. CAPM is built on the work of Harry Markowitz (1952) assuming that investors are risk averse choosing only mean-variance efficient portfolios. Hence, the theory created by Markowitz is often called *the mean variance model*. (Fama & French (2004.) CAPM is based on an assumption that the expected rate of return for security can be calculated as follows:

$$(1) \quad E(R_i) = R_f + \beta_i \times [E(R_m) - R_f]$$

Where $E(R_i)$ is the expected return of security i , R_f is the risk free rate, β is the beta of the security i and $E(R_m)$ is the expected market return. (Sharpe, Alexander & Bailey 1999.)

Bodie, Kane and Marcus (2003) introduce several simplifying conditions for CAPM to hold:

1. No transaction costs or taxes.
2. All the investors have identical holding period.
3. Investors behave rationally.
4. Investors are price-takers acting as the security prices are not affected by their trades.
5. Investments are limited to publicly traded financial assets.
6. All the investors have homogenous expectations.

Even though the capital asset pricing model was originally introduced decades ago, it has still real life applications such as estimating the firms cost of capital or evaluating the performance of a portfolio (Fama et al. 2004).

Fama and French (1993) propose an alternative model where the price of a security depends on the sensitivity of its return to market movements and two other portfolios replicating additional risk factors. This model is called the three-factor model:

$$(2) \quad R_{it} = \alpha_i + \beta_{iM}R_{Mt} + \beta_{iSMB}SMB_t + \beta_{iHML}HML_t + \varepsilon_{it}$$

where R_m is the market return. SMB describes the return of a portfolio containing small stocks in excess of a portfolio containing large stocks. In addition, HML describes the return of portfolio containing stocks with high B/M ratios in excess of return of portfolio containing stocks with low B/M ratios. SMB and HML characteristics are included in the three factor model because firm size and book-to-market ratios seem to have predictive power on average stock returns. (Fama et al. 1993.)

Fama and French (2015) contribute to their original theory of three common risk factors by adding two more to better explain the cross-section of stock returns: profitability (RMW) and investment patterns (CMA). RMW describes the difference in returns of diversified portfolios with strong and weak profitability. CMA measures the difference between returns of diversified portfolios of stocks that invest conservatively and stocks that invest aggressively. (Fama et al. 2015.)

3.2. Portfolio theory

Modern portfolio theory is based on the research of Harry Markowitz (1952). The Markowitz Portfolio Selection Model suggests that the first step for portfolio optimization is to identify the risk-return opportunities from the *minimum-variance frontier* of risky assets. Figure 4 demonstrates the efficient frontier. Minimum-variance frontier of risky assets is a graph indicating the lowest possible variance available for a given expected portfolio return. Upon portfolio construction, when short-selling is allowed, all the individual assets lie on the right side of the efficient frontier indicating that single-asset portfolios are inefficient. As a conclusion, figure 4 provides evidence that investment diversification leads to higher expected return and lower standard deviation. All the portfolios from the minimum-variance frontier and above the *global minimum-variance portfolio* can be characterized as possible optimal portfolios. (Bodie et al. 2003: 223 - 226.)

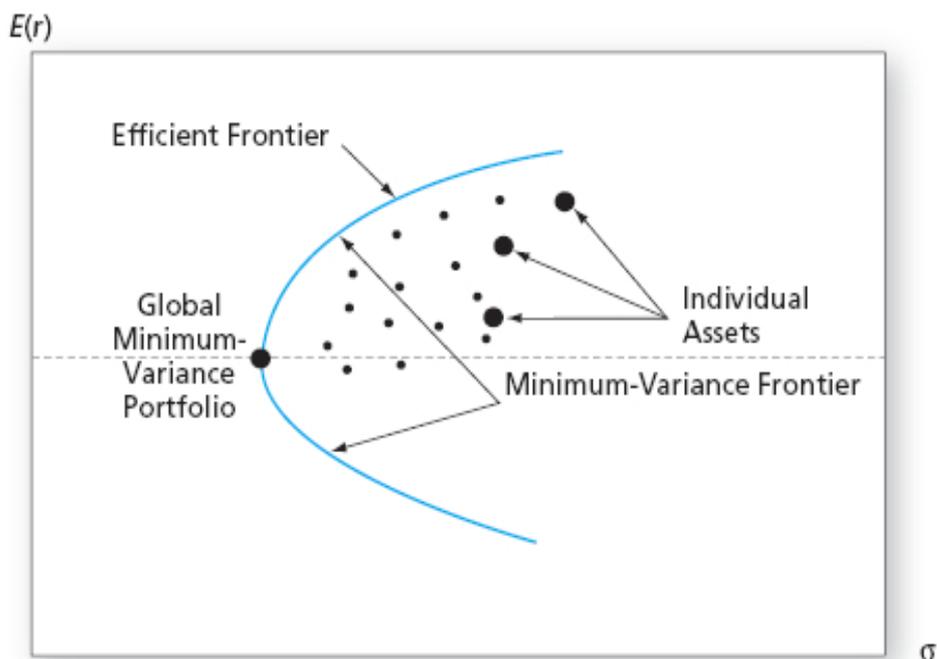


Figure 4. The minimum-variance frontier of risky assets (Bodie et al. 2003)

The second part for Markowitz's portfolio theory is the inclusion of risk-free assets. Figure 5 provides the optimal capital allocation line, which is the steepest slope on the efficient frontier. Point P from the figure demonstrates the optimal risky portfolio as it is the tangent to the efficient frontier. Finally, the investor will choose the desired allocation between the optimal portfolio and the risk-free assets. (Bodie et al. 2003: 226 - 227.)

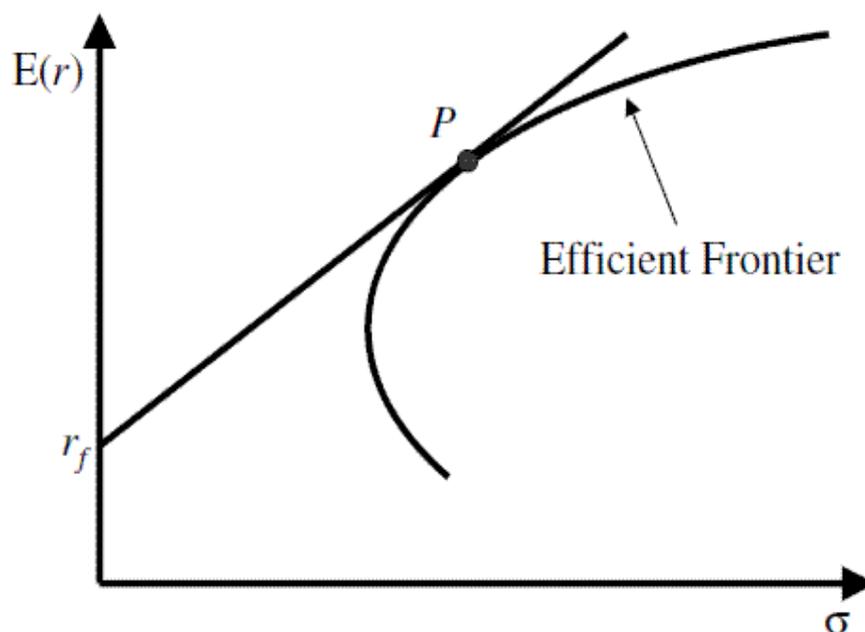


Figure 5. The efficient frontier of risky assets with optimal capital allocation line (Bodie et al. 2003)

3.3. Socially responsible investing

Conventional finance theory dictates that individual investors are characterized as rational when making investment decisions. This means that traditional finance theory does not identify the personal value or preferences when it comes to investment decision. If this holds, socially responsible investing would exist only because it provides equivalent returns at lower risk or higher returns for the same amount of risk. However, number of studies suggests that investors do not behave the way traditional finance theory typically assumes. It is well documented in the past decades that investors do not behave rationally in every situation. (Beal et al. 2005.)

There are number of examples of irrational investor behavior. Few examples of such occasions are overconfidence in trading, anchoring and framing. Overconfidence in trading refers to a situation where net returns decrease as trading increases and that men trade 45 per cent more than women (Odean 1998). Anchoring refers to a human behavior on a quantitative assessment and how it can be influenced by making irrelevant suggestions (Tversky & Kahneman 1973). Framing is related to the way the question or proposition is presented. It is well documented that framing can change the decision making process. (Slovic 1995.) Shefrin & Statman (1985) contribute to literature of investor's irrational behavior by stating that cognitive biases and emotions can affect

investor's decision making. Shefrin et al. (1985) state that investors see their investments as individual stocks rather than portfolio which makes it hard for them to realize losses.

Beal et al. (2005) list three main reasons investors invest ethically: superior financial returns, non-wealth returns and contribution to social change. Generating superior returns while investing ethically is the main motivational driver that conventional finance theory supports. However, there are number of studies investigating the link between firm's financial performance and responsibility but conclusive evidence that investing responsibly would generate superior returns has yet to be made. Beal et al. (2005) argue that non-wealth returns are one reason for socially responsible investing. Some investors identify the need to include additional goal in their investment decision: willingness to pay extra for ethical options. Finally, Beal et al. (2005) suggests one alternative motivation for socially responsible investing, achieving social change. These type of investors are investing in companies through which they can benefit the society. (Beal et al. 2005.)

A theoretical background for socially responsible investing can be derived from investor's utility function as the conventional finance theory fails to explain why investors invest ethically. Figure 6 presents a utility function of an ethical investor making an assumption that ethical investor shows some degree of risk aversion. Figure 4 displays an investment decision where W_0 is the current situation and W_2 is the amount of wealth if the decision is profitable and W_1 if the investment is lost. The utility derived from the investment depends on the ethicality of the investment. If the investment is seen as unethical, the investor will gain less utility compared to a situation of not investing. For this function to hold, it is necessary to assume that the psychic returns gained from ethical investing are similar to gambler's fun of participation. If the above-mentioned holds and investor earns more utility from making the ethical investment than avoiding it, the expected financial payoff increases through the positive fund of participation. Another conclusion than can be drawn from the ethical investor's utility function is that the investors gain more utility from smaller investments than higher. (Beal et al. 2005.)

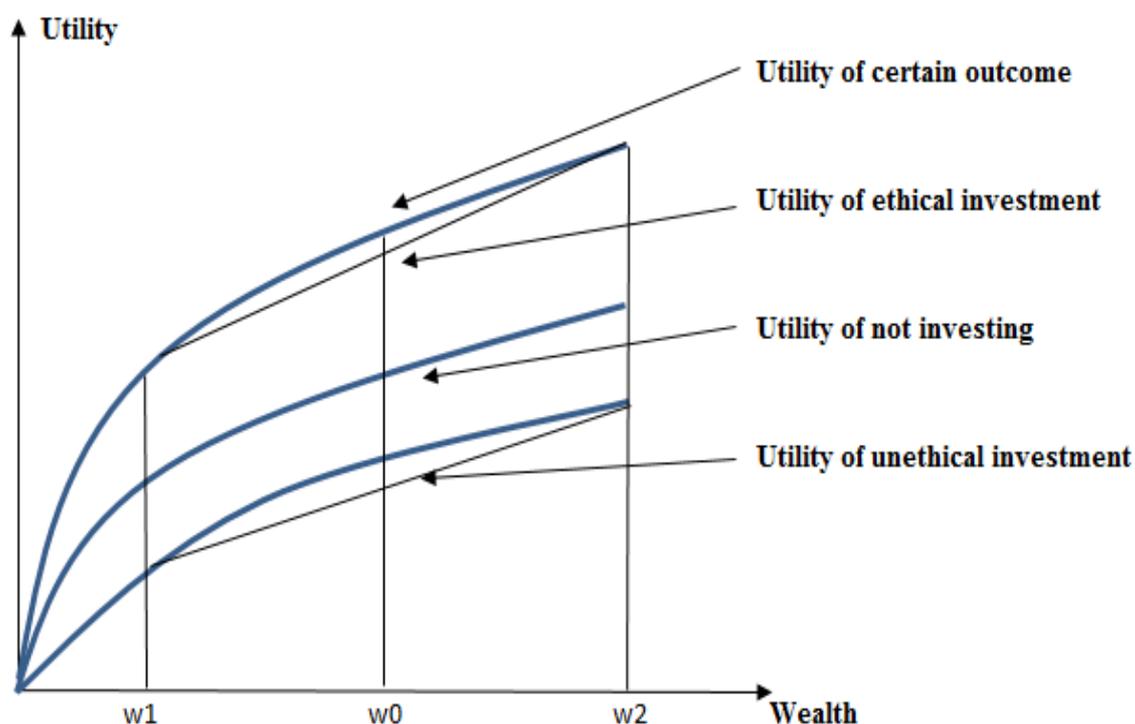


Figure 6. Ethical investor's utility function (Beal et al. 2005).

Another way to theoretically explain the socially responsible investing is to make modification to the utility function of modern finance theory:

$$(3) \quad U = f(E_R, \sigma_R),$$

where E_R describes the expected return which has the positive affect to utility and σ_R describes the expected standard deviation, or the risk of an investment with the negative influence to utility. To modify the utility function covering the socially responsible investing, additional argument has to be made. (Beal et al. 2005.)

$$(4) \quad U = f(E_R, \sigma_R, e)$$

Degree of ethicalness of the investment (e) is added to the utility function. Modification of the utility function will change the indifference curve for investors. Figure 7 demonstrates the difference in trade-off between the theoretical frameworks of conventional financial theory and ethical investing. In conventional finance theory, the investor's indifference curves slope upwards, because for bearing additional risk,

investors demand higher returns. However, for ethical investor, indifference curve changes to indifference plane showing the trade-offs the investor is willing to make between expected return, expected risk and the ethicalness of the investment. (Beal et al. 2005.) Beal et al. (2005) conclude that requiring financial return from investments is necessary for it to be called investing but suggests that there might be a trade-off between financial returns and psychic returns for ethical investors. (Beal et al. 2005.)

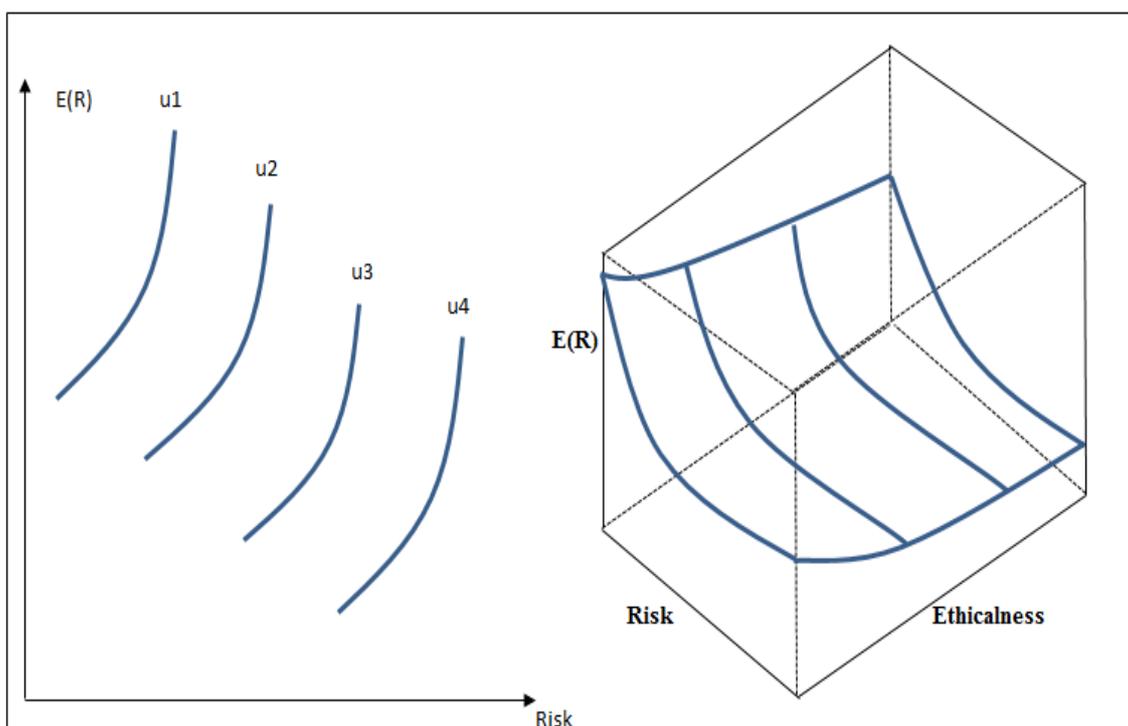


Figure 7. Investor's indifference curve & indifference plane of ethical investor (Beal et al 2005).

Chapter three provided thorough review on the theoretical side of socially responsible investing. Upcoming chapters seek to connect theory with practice by introducing previous research and by conducting regression-based analysis on the ESG investing and thoroughly analyzing the results.

4. PREVIOUS STUDIES

This section goes through the results from previous studies on socially responsible investing focusing on the financial performance of ethical investments. Numerous studies have been conducted about the financial performance of funds using SRI methods as an investment tool. The results are somewhat mixed varying from no statistically significant performance differences between socially responsible mutual funds and conventional mutual funds (Hamilton, Jo & Statman: 1993, Shank, Mannullang & Hill: 2005) to positive returns of socially responsible investing (Derwall, Guenster, Bauer & Kedijk: 2005, Derwall, Kedijk & Ter Horst: 2011). The negative performance impacts of SRI have also been documented (Adler & Kritzman: 2008, Renneboog, Ter Horst & Zhang: 2008).

4.1. Positive impact

Derwall et al. (2005) investigated the impact of socially responsible investing in portfolio performance focusing on a so called eco-efficiency concept. Eco-efficiency is defined as company's ability to create value compared to the waste it generates. The study was conducted by creating two equity portfolios using the eco-efficiency score as a differentiator between the portfolios. The study finds that the portfolio with the higher eco-efficiency score generates substantially higher average returns indicating that higher returns can be achieved using socially responsible investment strategy. (Derwall et al. 2005.)

The positive relationship between SRI and stock returns have also been documented by Derwall et al. (2011). The study indicates that profit-driven investment strategy creates positive abnormal returns for SRI stocks, however, only in the short run. Profit-driven implementation of socially responsible investing is based on an assumption that investors use 'positive' screens to pick out the highest ranked stocks on socially responsible criteria rather than leaving the worst out (value-oriented SRI). According to Derwall et al. (2011), the differentiation between value-oriented and profit-oriented strategies on socially responsible investing is important because it helps to explain the evidence why both socially responsible and controversial stocks are producing superior returns. Derwall et al. (2011) argue that the controversy of both socially responsible and controversial stock producing abnormal returns can be explained through two hypothesis: shunned-stock and the errors-in-expectation hypothesis. Shunned-stock hypothesis states that value-driven

investors are causing the controversial stocks to trade at relatively lower level because they refuse to include stocks in their portfolio that are colliding with their personal values. Shunned-stock hypothesis relies on the assumption that value-driven investors are sufficient in number to affect the supply and demand of the controversial securities. Through above-mentioned mechanism, it is possible for stocks that are avoided by value-driven socially responsible investors to become mispriced and produce positive abnormal returns. In addition, the-errors-in-expectation hypothesis states that the reason socially responsible investing can create superior performance stems from the reason that the market does not value corporate socially responsibility's (CSR) ability to positively affect the future cash flows of the company. According to Derwall et al. (2011), sometimes these two hypothesis can cancel out each other causing the "no net-effect" to occur. This could be the case for example when mutual fund using SRI criteria implement screens based on these two hypothesis. (Derwall et al. 2011.)

Bauer et al. (2005) investigate the performance of ethical mutual funds compared to conventional funds in Germany, United States and United Kingdom during the time-period from 1990 to 2001. Bauer et al. (2005) state that socially responsible mutual funds went through a so called 'catching-up' phase as they underperformed significantly during early 1990's but were able to match the risk-adjusted returns of their conventional counterparts during the final third of the sample period from 1998 to 2001. In fact, during the last period, ethical mutual funds were able to provide superior risk-adjusted returns compared to the conventional mutual funds but alphas were statistically significant in only two cases. One possible reason behind the established performance improvements is learning because socially responsible mutual fund is relatively new concept. (Bauer et al. 2005.)

4.2. No significant impact

Hamilton et al. (1993) and Shank et al. (2005) report that socially responsible mutual funds do not generate statistically significant excess returns compared to their conventional counterparts. Shank et al. (2005) state that the lack of statistically significant performance differences between these funds is caused by the notion that market do not price the SRI characteristics, at least, in the short run (less than five years). However, measuring the ten-year performance of portfolio including eleven most favored firms in socially responsible mutual funds, Shank et al. (2005) discovered that the socially responsible characteristics were valued by the market in the long run.

In addition, it is worth noting that during the sample period, none of the socially responsible mutual funds produced statistically significant excess returns. It was only the portfolio gathered from firms most favored by the SRMF managers that outperformed the market and produced positive and statistically significant Jensen's alpha. The outperformance of individual firms most favored by socially responsible mutual fund managers provides interesting implications. It is likely that the disclosure requirements for ESG information will grow in the future through increasing public awareness and regulation. This, in part, transfers the socially responsible behavior into pricing of the securities leading to an increased investments in socially responsible firms. (Shank et al. 2005.)

While investigating the risk-adjusted returns of equity SRI indexes compared to their benchmarks, Schröder (2007) discovered that SRI screening does not lead to excess risk-adjusted returns nor underperformance. The results are interesting in a sense that using screens to reduce the investment universe, should according to portfolio theory, lead to a decrease in risk-adjusted returns. The results from the Schröder's (2007) study indicate that there is no additional cost of lower returns when using socially responsible investment strategies. In addition, the study reveal that most of the indexes using socially responsible screens have higher risk compared to their benchmarks. (Schröder 2007.)

In contrast to the research of Schröder (2007), El Ghoul, Guedhami, Kwok and Mishra (2011) state that firms with socially responsible practices are valued higher and have lower risk. El Ghoul et al. (2011) state that improving company's employee relations, environmental policies and product strategies will reduce company's cost of equity capital.

4.3. Negative impact

There are number of studies reporting the negative side of socially responsible investing when it comes to generating returns. Girard, Rahman & Stone (2007) investigated the total cost of SRI by using monthly returns of 116 socially responsible mutual funds for the time period of 1984 to 2003. Girard et al. (2007) compared the selectivity cost, diversification cost and market timing ability to benchmark index. They found that expense ratios or the size of the socially responsible mutual funds has no significant impact on fund's performance. However, the study suggests that the selectivity cost

caused by the socially responsible screens implemented in fund's securities picking process is higher with older funds. The study also suggests that increasing the ethical screens of the fund will cause a decrease in the fund's selectivity and net selectivity. (Girard et al. 2007.)

Table 2 provides an overview of the results of the socially responsible mutual funds selectivity, diversification, net selectivity and market timing. Funds are broken into three different main categories: equity funds, balanced funds and bond funds. The table presents clear evidence on selectivity that SRMF are unable to outperform the buy-and-hold strategy showing negative results in all the categories and time periods. However, the results are statistically significant for 'all funds' category only in 5 and 10 year time periods indicating that socially responsible mutual funds could perform similarly to benchmark index for shorter time periods (3 years or less). The table also states that the securities picking is hardest for the ethical bond fund managers showing statistically significant negative results even on a 3-year time period. (Girard et al. 2007.)

Implementing ethical screens on investment decision increases the cost of diversification. Table 2 indicates that the diversification costs are statistically significant in all of the four categories for 10-year time period. The results on diversification are negative but not statistically significant for shorter time spans. It is also worth noting that the cost of diversification is highest for the equity funds and lowest for bond funds. Net selectivity describes the combined cost of selectivity and diversification and is used to present the total cost of investing in socially responsible mutual funds. Table 2 shows that the net selectivity is negative and statistically significant for all the fund categories during the 10 and 5-year time periods. The results on net selectivity indicate that ethical investors have to withstand a significant costs on their investments varying from approximately 7% to 9% per year. Finally, the table shows that there are no statistically significant results on market timing which indicates that socially responsible fund managers have no significant ability to gain from the effects of market trends. However, for 10-year time period, all the coefficients are negative for market timing giving a weak indications that socially responsible mutual funds are influenced by weak active management. (Girard et al. 2007.)

Table 2. Median Selectivity, Net Selectivity, Diversification and Market Timing. (Girard et al. 2007).

Span (# of Months)	10 Years (121)		5 Years (118)		3 Years (203)		1 Years (228)	
Selectivity								
All Funds	-3.37%**	(-2.45)	-3.39%**	(-2.05)	-3.59 %	(-1.31)	-2.67 %	(-0.39)
Equity Funds	-0.72 %	(-0.28)	-0.63 %	(-0.20)	-1.58 %	(-0.29)	-0.76 %	(-0.07)
Balanced Funds	-2.74%***	(-2.71)	-1.75 %	(-0.59)	-1.72 %	(-0.38)	-2.60 %	(-0.32)
Bond Funds	-5.60%***	(-12.69)	-5.58%***	(-5.97)	-5.36%***	(-3.92)	-4.91 %	(-1.53)
Diversification								
All Funds	5.95%***	(-2.95)	5.36%*	(-1.7)	4.40 %	(-0.87)	4.67 %	(-0.48)
Equity Funds	8.02%***	(-3.95)	7.47 %	(-1.61)	6.90 %	(-0.94)	7.10 %	(-0.55)
Balanced Funds	6.06%***	(-3.68)	6.15 %	(-1.56)	5.79 %	(-0.95)	6.49 %	(-0.65)
Bond Funds	1.59%***	(-3.78)	1.54%**	(-2.01)	1.70 %	(-1.24)	2.07 %	(-0.57)
Net Selectivity								
All Funds	-9.32%***	(-8.04)	-8.75%***	(-3.38)	-8.00%***	(-2.94)	-7.34 %	(-1.40)
Equity Funds	-8.74%***	(-3.61)	-8.10%*	(-1.90)	-8.49 %	(-1.23)	-7.86 %	(-0.74)
Balanced Funds	-8.80%***	(-7.68)	-7.89%**	(-2.49)	-7.51%*	(-1.85)	-9.10 %	(-1.26)
Bond Funds	-7.19%***	(-12.49)	-7.12%***	(-6.38)	-7.06%***	(-5.24)	-6.9%**	(-2.55)
Market Timing								
All Funds	-0.8	(-1.46)	-0.9	(-0.38)	-0.15	(-0.05)	1.58	(-0.26)
Equity Funds	-0.66	(-0.87)	-0.59	(-0.19)	0.52	(-0.13)	2.6	(-0.29)
Balanced Funds	-1.03	(-1.14)	-1.05	(-0.27)	-0.61	(-0.11)	3.8	(-0.2)
Bond Funds	-0.92	(-0.45)	0.46	(-0.1)	1.03	(-0.16)	1.63	(-0.09)

Figures of selectivity, diversification cost and net selectivity are per annum. T-statistics are in parentheses. ***, ** and * indicate statistical significance at the 1, 5 and 10% levels.

Adler et al. (2008) have also been investigating the cost of socially responsible investing. They argue that investors who restrict their stock universe with ethical screens will suffer a cost compared to an investor whose security universe is not restricted to socially responsible investing. The cost suffered is affected by the investor's skill, cross-sectional dispersion of the universe, the fraction of the restricted universe and number of securities in the investment portfolio. (Adler et al. 2008.)

Table 3 represents the cost of socially responsible investing for portfolios of 250 stocks. The table shows that the cost of socially responsible investing increases with the investor's skill. For example, investor who ranks correctly 60 per cent of the investment universe with cross-sectional dispersion similar to S&P 500 (35%) and the fraction of excluded securities set up to 30 per cent is likely to give up 2.24 per cent of the portfolio value compared to an investor with no restraints. However, if the investor were to rank only 54 per cent of the securities correctly, the investor has to give up only 0.87 per cent of portfolio value compared to a non-restricted counterpart. (Adler et al. 2008.)

The table also shows that strong relationship exists between the fraction of excluded securities and the cost of socially responsible investing: increase in the fraction of excluded securities will increase the cost of socially responsible investing. The table also suggests that the cost of SRI increases with the cross-sectional dispersion. (Adler et al. 2008.)

Table 3. Cost of socially responsible investing for 250 stock portfolios (Adler et al. 2008).

S & P 500 dispersion (35%)						
Fraction of correct choices						
Fraction of excluded securities	50 %	52 %	54 %	56 %	58 %	60 %
10 %	0.00 %	0.12 %	0.22 %	0.37 %	0.48 %	0.60 %
20 %	-0.02 %	0.25 %	0.53 %	0.79 %	1.05 %	1.32 %
30 %	-0.02 %	0.47 %	0.87 %	1.36 %	1.78 %	2.24 %
Fraction of correct choices						
MSCI EAFE dispersion (39%)						
Fraction of excluded securities	50 %	52 %	54 %	56 %	58 %	60 %
10 %	-0.01 %	0.12 %	0.29 %	0.39 %	0.53 %	0.66 %
20 %	0.01 %	0.27 %	0.58 %	0.87 %	1.19 %	1.47 %
30 %	-0.03 %	0.49 %	0.99 %	1.48 %	2.00 %	2.49 %
Fraction of correct choices						
MSCI World dispersion (44%)						
Fraction of excluded securities	50 %	52 %	54 %	56 %	58 %	60 %
10 %	0.00 %	0.13 %	0.30 %	0.43 %	0.60 %	0.76 %
20 %	-0.02 %	0.33 %	0.66 %	1.01 %	1.34 %	1.70 %
30 %	-0.04 %	0.57 %	1.08 %	1.68 %	2.24 %	2.82 %
Fraction of correct choices						
MSCI ACWI Dispersion (64%)						
Fraction of excluded securities	50 %	52 %	54 %	56 %	58 %	60 %
10 %	0.01 %	0.21 %	0.46 %	0.66 %	0.86 %	1.09 %
20 %	-0.02 %	0.51 %	0.94 %	1.44 %	1.94 %	2.44 %
30 %	-0.01 %	0.75 %	1.64 %	2.41 %	3.28 %	4.13 %

Adler et al. (2008) further argue that if the motivation behind owning socially responsible companies is that they produce superior returns, that is not socially responsible investing. Rather, it is active management strategy to create excess returns. This is inconsistent with the definition of socially responsible investing which states that even otherwise attractive companies are to be excluded from investor's portfolio because they are socially irresponsible. This definition will create a cost where the exclusion of even one controversial company outperforms its socially responsible substitute. (Adler et al. 2008.)

5. DATA

The purpose of this chapter is to introduce the data used in the thesis. Chapter better explains the concept of ESG disclosure score and the method of how it is formulated. In addition, chapter five goes through the development of ESG disclosure score in Finland using other Nordic countries as a peer group.

5.1. Data description

The data consist of ecological, social and governance disclosure scores of companies listed in Helsinki stock exchange during the time period of 31.12.2006 - 14.12.2016. ESG disclosure score rates the company based on its disclosure of quantitative and policy-related ESG data. The score is based on more than 120 indicators and the rating scale ranges between 0 – 100. The company will get the score of 100 if it is able to cover all the ESG-related information measured by Bloomberg. Companies are ranked annually based on the information it has disclosed during that year. (Bloomberg 2016.)

Figure 8 presents the number of companies with ESG disclosure score during the time period of 2006 to 2015. As it can be seen from figure, the total number of companies with ESG score have increased drastically during the sample period. The total number of companies with ESG disclosure score in Finland has increased from 19 in 2006 to 59 by the end of 2015 increasing over 200%. However, after the number of companies with ESG disclosure score doubled in 2007, the increase has been steady up until 2012. After the 2012, companies with ESG disclosure score has even decreased. In addition, figure 8 presents the number of companies listed on the stock exchange during the same time period. It can be seen from the figure that the number of companies listed on the stock exchange was affected by the financial crises dropping from 148 at the end of 2007 to 128 at the end of 2013. After the financial crisis period, the number of listed companies has stayed more or less the same.

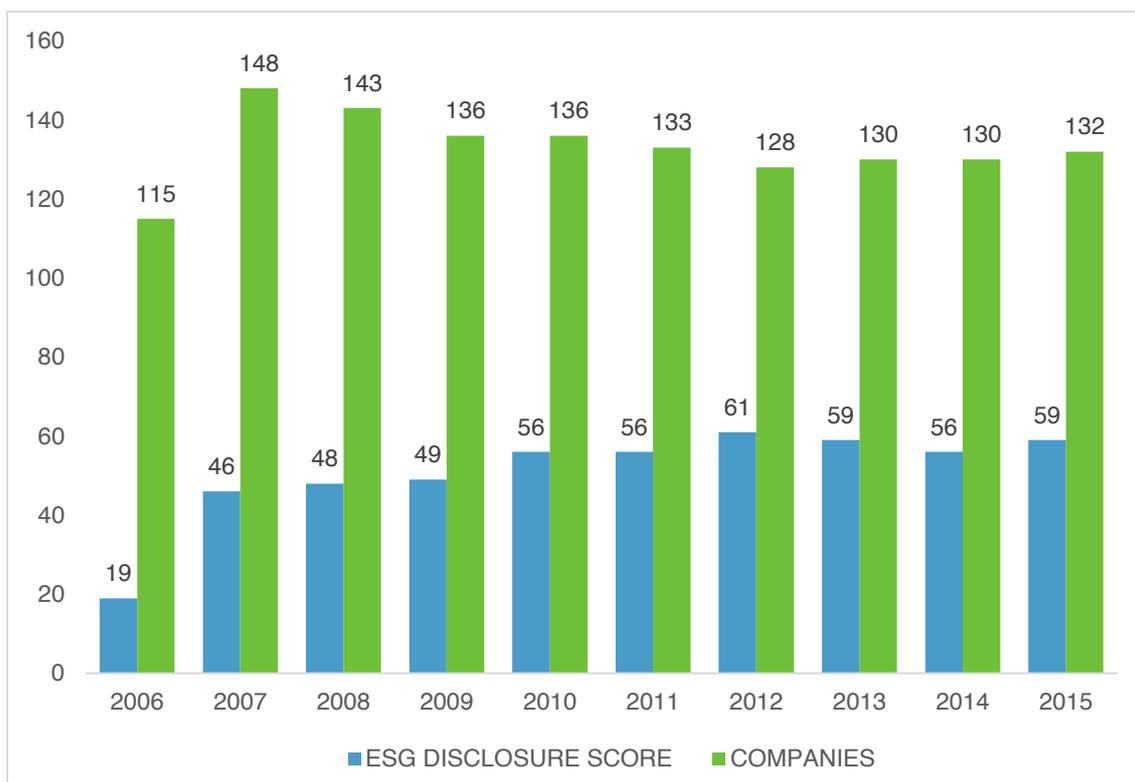


Figure 8. Number of companies with ESG disclosure score during 2006-2015 (Bloomberg).

Table 4 summarizes the results presented in the previous figure. Additionally, table 4 provides comparable information of companies with ESG disclosure score by documenting the results from other Nordic stock exchanges. Table clearly indicates the increasing popularity amongst companies to disclose their ecological, social and governance information. Table 4 shows that Finland ranks highest during the early stages of the sample period. Finland is the only country to have above average number of companies with ESG disclosure score every year. However, the differences between countries have evened out during the final years of the sample period. Another fact that can be drawn from the table is that companies listed in the Denmark's stock exchange are the most reluctant to disclose their social, ecological and governance information.

Table 4. The percentage of companies with ESG disclosure score in the Nordic countries (Bloomberg).

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Finland	16.5 %	31.1 %	33.6 %	36.0 %	41.2 %	42.1 %	47.7 %	45.4 %	43.1 %	44.7 %
Sweden	10.0 %	25.5 %	27.9 %	30.2 %	32.4 %	37.8 %	40.0 %	39.9 %	41.3 %	38.0 %
Norway	3.4 %	11.8 %	16.6 %	17.2 %	34.6 %	38.1 %	39.5 %	43.5 %	43.3 %	43.9 %
Denmark	5.7 %	16.8 %	16.9 %	16.8 %	19.0 %	23.7 %	28.4 %	30.1 %	31.8 %	28.3 %

However, table 4 only covers the fraction of companies disclosing some information related to ESG criteria leaving out the fact of how much information has been covered by set company. Table 5 gives better indication about the ESG disclosure score by showing how much information has been disclosed by companies on average during each year of the sample period. Even though the number of companies with ESG disclosure score has increased during the sample period, it seems that the average score has been more or less the same. However, the table indicates that there has been steady development on the average scores of Finnish companies rising from the 30.75 in 2006 to 41.32 at the end of 2015. Companies listed on the stock exchanges of Denmark and Norway have the lowest average scores. Another conclusion that can be drawn from the table is that the highest scores vary significantly between the countries and years. For example, in Finland the highest score during the sample period is 80.99 in 2012, when in 2006 it is only 44.62. Similar results are documented from others countries as well.

Table 5. The average and highest ESG disclosure scores 2006-2015 (Bloomberg).

		Finland	Sweden	Denmark	Norway
2006	Average	30.75	34.87	25.14	26.12
	Highest	44.62	52.06	42.14	37.60
2007	Average	29.19	29.42	22.75	23.49
	Highest	49.57	58.68	47.37	48.34
2008	Average	33.03	32.15	25.12	25.56
	Highest	59.65	61.98	59.65	50.41
2009	Average	36.32	34.48	30.55	27.15
	Highest	67.11	67.11	67.10	53.72
2010	Average	38.81	35.09	30.74	21.27
	Highest	77.27	70.18	70.18	59.92
2011	Average	38.81	34.84	29.50	20.80
	Highest	77.27	67.35	58.77	63.22
2012	Average	38.76	35.83	30.49	21.13
	Highest	80.99	73.14	54.82	61.16
2013	Average	40.65	35.93	29.88	22.73
	Highest	78.15	74.38	54.82	60.74
2014	Average	41.19	35.22	30.45	23.35
	Highest	77.66	73.14	55.37	60.33
2015	Average	41.32	36.18	31.28	22.83
	Highest	67.36	71.90	55.79	60.33

In addition, table 6 presents the sector allocation of the companies listed in Helsinki stock exchange during the first and the last year of the sample period. Companies are allocated based on the ESG disclosure information. It can be seen from the table that allocation between companies with ESG disclosure score has evened out during the sample period. This is due to a fact that companies disclosing their ecological, social and governance information has increased. Interestingly enough, it seems that companies in software and computer services rarely disclose information related to ESG factors. In addition, companies in industry-related sectors, such as forestry, metal and mining, are more likely to disclose their ESG information than other sectors. One possible reason behind the sector allocations is the difference in regulatory standards for different sectors. Industry-related companies are required to disclose more ESG-related information, especially in the environmental part as the global warming issues are increasingly popular.

Table 6. Sector allocation of companies listed in Helsinki stock exchange 2006 and 2015 (Datastream,).

Sector	2006		2015	
	With score	No score	With score	No score
Automobiles and Parts	7.14 %	0.00 %	2.13 %	0.00 %
Banks	0.00 %	1.82 %	2.13 %	1.52 %
Beverages	0.00 %	0.91 %	0.00 %	1.52 %
Chemicals	0.00 %	1.82 %	2.13 %	0.00 %
Construction and Materials	0.00 %	4.55 %	6.38 %	6.06 %
Electricity	7.14 %	0.00 %	2.13 %	0.00 %
Electronic and Electrical Equipment	0.00 %	7.27 %	4.26 %	9.09 %
Financial Services	0.00 %	0.00 %	0.00 %	0.00 %
Fixed Line Telecommunications	0.00 %	0.91 %	2.13 %	0.00 %
Food and Drug Retailers	7.14 %	0.00 %	2.13 %	0.00 %
Food Producers	0.00 %	3.64 %	6.38 %	1.52 %
Forestry and Paper	21.43 %	1.82 %	8.51 %	1.52 %
General Industrials	0.00 %	1.82 %	2.13 %	1.52 %
General Retailers	0.00 %	1.82 %	2.13 %	0.00 %
Health Care Equipment and Services	0.00 %	3.64 %	0.00 %	4.55 %
Household Goods and Home Construction	0.00 %	3.64 %	2.13 %	3.03 %
Industrial Engineering	7.14 %	13.64 %	17.02 %	10.61 %
Industrial Metals and Mining	14.29 %	0.91 %	2.13 %	1.52 %
Industrial Transportation	7.14 %	0.91 %	0.00 %	1.52 %
Leisure Goods	0.00 %	1.82 %	4.26 %	0.00 %
Media	0.00 %	6.36 %	4.26 %	4.55 %
Mining	0.00 %	0.91 %	0.00 %	1.52 %
Nonlife Insurance	7.14 %	0.00 %	2.13 %	0.00 %
Oil and Gas Producers	0.00 %	0.91 %	2.13 %	0.00 %
Personal Goods	0.00 %	2.73 %	2.13 %	1.52 %
Pharmaceuticals and Biotechnology	7.14 %	0.91 %	2.13 %	1.52 %
Real Estate Investment and Services	0.00 %	5.45 %	6.38 %	1.52 %
Real Estate Investment Trusts	0.00 %	0.00 %	0.00 %	1.52 %
Software and Computer Services	0.00 %	14.55 %	2.13 %	21.21 %
Support Services	0.00 %	7.27 %	4.26 %	9.09 %
Technology Hardware and Equipment	7.14 %	2.73 %	4.26 %	1.52 %
Travel and Leisure	7.14 %	2.73 %	2.13 %	4.55 %
Financial Services (Sector)	0.00 %	4.55 %	0.00 %	7.58 %
Unclassified	0.00 %	0.00 %	0.00 %	0.00 %
	100.00 %	100.00 %	100.00 %	100.00 %

6. METHODOLOGY

This thesis analyses the impact of company's ESG disclosure score on its performance. Methodology applied in the thesis is based on the study conducted by Schröder (2007). The purpose of the thesis is to determine if investing via ESG screens has an impact on the portfolio performance.

The study is conducted by creating two equally weighted portfolios from the companies listed in the Helsinki stock exchange during the time period of 31.12.2006 – 14.12.2016. Portfolios are created using Bloomberg's ESG disclosure score as a differentiator: companies with ESG disclosure score and companies without. Bloomberg updates the ESG disclosure score of the company after every year based on the amount of information disclosed by the company (Bloomberg 2017). Portfolios are rebalanced after each year based on the changes in companies ESG disclosure score. Benchmark index is created by using all the stocks listed in Helsinki stock exchange during the above mentioned time period.

6.1. Hypotheses

The study is based on the assumption that companies disclosing the most information about the ecological, social and governance issues are more socially responsible than their non-disclosing counterparts. First hypothesis is based on the impact of ESG criteria on company's performance. Hypothesis is derived from the work of Girard et al. (2007) where they seek to measure the total cost of socially responsible investment screens. Girard et al. (2007) conclude that SRI funds carry a cost related to social constraints which is mainly related to diversification problems.

H1: Using ESG disclosure score as a screen has a negative impact on portfolio performance.

Second hypothesis continues further and compares the performance differences between companies with and without the ESG disclosure score. Hypothesis is based on the research of Renneboog et al. (2008) where they investigate the possible cost of socially responsible investments. The main hypothesis from the paper of Renneboog et al. (2008) is that investors pay a price for the usage of SRI screens by funds. This happens through

stock price influence caused by ethical, social, environmental and governance screens (Renneboog et al. 2008).

H2: Companies with no ESG disclosure score outperform their socially responsible counterparts.

Finally, the third hypothesis compares the seasonal characteristics of the two portfolios measuring how they perform during different market conditions. Hypothesis is related to the research of Nofsinger et al. (2014) where they test the effects of different market conditions on portfolio performance. Nofsinger et al. (2014) argue that socially responsible firms perform better during market turmoil due to a good governance standards.

H3: ESG portfolio outperforms the non-ESG portfolio during market crisis period.

All the three hypotheses are based on the previous research on socially responsible investing. However, the thesis seeks to provide contribution to the existing literature by using different perspectives and data. Hypotheses are tested in the results and discussion section.

6.2. Portfolio performance

Performance of the equally weighted portfolios is measured using the equations from Schröder's (2005) paper:

$$(5) \quad r_{p,t} = \alpha_p + \beta_p r_{bm,t} + \varepsilon_{i,t}$$

The performance measures of the two portfolios are based on the Jensen's alpha (α), which illustrates the excess return that is not explained by the portfolio's exposure to risk with respect to the return of the benchmark index (r_i). The beta coefficient is used to demonstrate the relative risk of the portfolio in comparison to the benchmark index meaning that if $\beta_p > 1$, portfolio is riskier than its benchmark. (Schröder 2005) Table 7 provides annualized returns for the two sample portfolios and for the market index. Evidence from the table clearly documents the effect of financial crisis periods in 2008 and 2011. Chapter seven better explains and analyses the differences between the two portfolios and introduces risk measures.

Table 7. Annualized returns of the sample portfolios and market index 2007 – 2016 (Datastream).

Year	ESG Portfolio	Non-ESG portfolio	Market index
2007	0.56 %	2.25 %	2.04 %
2008	-51.14 %	-44.11 %	-46.43 %
2009	58.19 %	48.11 %	51.73 %
2010	30.94 %	15.05 %	20.68 %
2011	-28.92 %	-22.49 %	-25.23 %
2012	8.51 %	0.24 %	3.82 %
2013	14.10 %	26.94 %	20.81 %
2014	3.57 %	-4.94 %	-1.09 %
2015	15.32 %	31.00 %	24.38 %
2016	20.16 %	2.64 %	9.47 %

7. RESULTS AND DISCUSSION

Results and discussion part starts with a further analysis on the performance characteristics of the two portfolios now including risk and performance measures. Table 8 represents the time series characteristics of the two portfolios including annualized excess returns, standard deviations and Sharpe ratios.

The Sharpe Ratio measures the excess return (ie. return above the risk-free interest rate) divided by the total risk of the portfolio (Schröder 2005):

$$(6) \quad \text{Sharpe ratio}_p = (R_p - r_f) / \sigma_p,$$

where R_p is the annualized logarithmic return of the portfolio, r_f is the risk-free interest rate (Finland 1-year government bond yield) and σ_p represents the standard deviation of the portfolios logarithmic returns.

Table 8 indicates that the average standard deviation is higher for ESG-related portfolio. Furthermore, the table provides evidence that the financial crisis and its aftermath created more volatility on ESG portfolio than in portfolio constructed from stocks without ESG disclosure score. However, it seems that after the financial crisis period, 2012 onwards, the volatilities of the portfolios has evened out or even turned the other way. One possible explanation behind the changes in volatility is the change in sector allocation in the portfolios during the sample period. Table 6 from chapter five represents the changes in sector allocation from 2006 to 2015. For example, the weight of forestry and paper industry has decreased from 21.43 % to 8.51 %. In addition, the weight in industrial metals and mining sector has decreased from 14.29 % to 2.13 %. This, in part, can influence the volatility of the portfolio due to a more even allocation between the sectors. During the sample period, average standard deviation of the market portfolio has varied between 6.867 % in 2014 and 23.925 % in 2009 averaging 15.707%.

Table 8 shows that the mean excess return during the sample period is higher for the ESG portfolio. While this could be explained by the higher volatility of the ESG portfolio, Sharpe ratio is added to the table to indicate the risk adjusted returns during the sample period. The average annualized Sharpe ratio for the ESG portfolio is higher (0.448) compared to the Non-ESG portfolio (0.155) while the average Sharpe for the market portfolio is 0.297. As a conclusion, ESG portfolio generates better risk adjusted returns than market index and Non-ESG portfolio. However, further analysis is required to

determine if the first hypothesis, that socially responsible investments has a negative impact on portfolio performance, can be rejected.

Table 8. Descriptive statistics of the sample portfolios.

	ESG			NON-ESG		
	Return	St.dev	Sharpe	Return	St.dev	Sharpe
2007	-3.397 %	13.442 %	-0.253	-1.707 %	14.778 %	-0.116
2008	-52.854 %	25.087 %	-2.107	-45.824 %	16.808 %	-2.726
2009	57.394 %	28.479 %	2.015	47.314 %	22.777 %	2.077
2010	30.337 %	17.793 %	1.705	14.447 %	17.400 %	0.830
2011	-28.855 %	16.592 %	-1.739	-22.425 %	15.803 %	-1.419
2012	8.384 %	18.765 %	0.447	0.114 %	17.691 %	0.006
2013	13.917 %	11.785 %	1.181	26.757 %	15.206 %	1.760
2014	3.634 %	8.154 %	0.446	-4.876 %	7.039 %	-0.693
2015	15.698 %	18.835 %	0.833	31.378 %	20.825 %	1.507
2016	20.961 %	10.764 %	1.947	3.437 %	10.772 %	0.319
Average	6.522 %	16.970 %	0.448	4.861 %	15.910 %	0.155

Table 9 provides a regression-based test on the performance of the two portfolios during the sample period using excess return as an independent variable. The estimations are based on the monthly returns of the two equally weighted sample portfolios and the market index. Excess returns are calculated using the CAPM formula and Finnish 1-year government bond yield as a risk free interest rate. Table indicates that the alphas of the portfolios are negative but close to zero and not statistically significant. The table provides clear evidence that the differences in returns between the ESG portfolio and non-ESG portfolio is explained through exposure to market risk (ie. beta). Betas for both portfolios are statistically significant at 1% level. Table provides evidence that the results from this thesis is in line with research of Schröder (2005) indicating that implementing ESG screens for equities do not lead to a significant outperformance or underperformance of the portfolio. In addition, as the alphas for the both portfolios are statistically insignificant, null hypotheses for both H1 and H2 can be rejected. Based on the table 9 regression, using company's ESG disclosure score as a screen does not have a negative effect on the performance of the portfolio nor does it underperform compared to its non-disclosing counterparts. As a conclusion, table 9 provides evidence that the companies disclosing their ecological, social and governance issues are not overperforming or underperforming companies that do not disclose ESG information.

Table 9. Regression results on excess returns of the two sample portfolios.

Portfolio	Average return	CAPM alpha (α)	Beta (β)	Adjusted R ²
ESG Portfolio	0.290 %	-0.006 % (-0.038)	1.050*** (34.204)	0.908
Non-ESG Portfolio	0.274 %	-0.001 % (-0.012)	0.976*** (53.063)	0.960

The t-statistics are presented in parenthesis. The significance of the results is determined on 1%, 5% and 10% levels with ***, ** and * respectively.

As there is no statistically significant evidence that firms disclosing ecological, social and governance issues will underperform, an interesting point can be made. Firms publicly disclosing their ESG issues are more transparent as there is more information publicly available to investors about the ecological, social and governance issues. Furthermore, transparency reduces volatility of the stock. In addition, firms leaving their ESG matters undisclosed may cause investors to question how these issues are handled in those firms. ESG matters are increasingly popular topic in the media and especially ecological issues, such as carbon footprints of the investment portfolios are constantly measured. Hence, ESG related shocks in firms will gain a substantial amount of media coverage which might cause a stock price to plummet. Disclosing their ESG-related information, firms ensure that the stock price will reflect all the ESG related information and simultaneously reducing the possible effect of ESG crisis. However, it is worth to remember that disclosing ecological issues is more important to industry-related companies than for companies providing software and computer services as the carbon footprint is much higher for the former.

In addition, results from the table 9 provide evidence that restricting investment universe does not lead to a decrease in portfolio's performance. According to optimal portfolio theory discussed in chapter three, reducing the investment universe should lead to a decrease in risk-adjusted returns. Results from the table are in line with the research of Schröder (2007) providing evidence that investments using SRI-related screens do not lead to additional costs in terms of lower returns. Furthermore, similarly to Schröder (2007), table 9 indicates that ESG-related portfolio has a higher exposure to market movements than the non-ESG portfolio.

7.1. Market crisis

The third hypothesis of the thesis is related to the performance of the two sample portfolios during crisis and non-crisis periods stating that firms disclosing their ESG criteria will perform better than their non-disclosing counterparts during market crisis. Crisis periods are identified using the same method as Nofsinger et al (2014) by basing the crisis periods in the stock market according to peak and trough of the market index (HEX).

The first crisis period occurred during the global financial crisis from March 2007 to March 2009 which saw the HEX index to fall from 12 525.87 to 4 136.21, over 66 per cent. The second crisis period began on March 2011 and lasted until (7 561.03) May 2012 causing the HEX index to plummet from 7 561.03 to 4 986.13 dropping over 33 per cent in 14 months.

Figure 9 illustrates the development of HEX index during the sample period from the beginning of 2007 to the end of 2016. In addition, the figure demonstrates the monthly difference in returns of the two sample portfolios during the same time frame. It can be seen from the figure that the differences in returns are the highest during the first crisis period and in its aftermath. One possible explanation behind the higher differences between the two sample portfolios is the volatility. Table 8 shows an increase in volatility of the ESG portfolio compared to non-ESG portfolio during the financial crisis period.

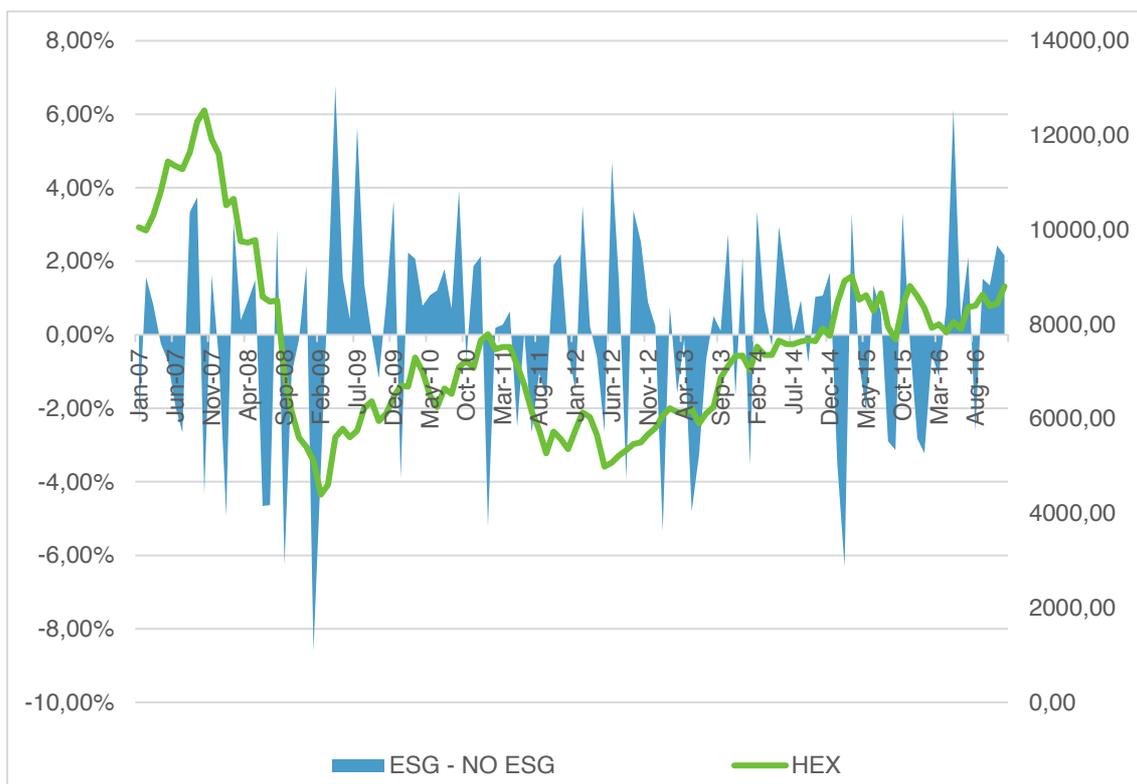


Figure 9. The development of HEX index and differences in the returns of sample portfolios (Datastream 2016; Bloomberg 2016).

Table 10 contains the result from regression-based analysis on the two sample portfolios during the crisis and non-crisis periods. Results from the table indicate that the alphas of the portfolios are not statistically significant on either market scenarios. However, table 10 provides interesting implications on the differences between alphas for the two portfolios. In contrast to the third hypothesis that ESG portfolios outperform non-ESG portfolios during the market crisis, the table provides evidence that ESG portfolios create positive alphas during non-crisis period and negative for the crisis period. The situation is the opposite for the non-ESG portfolios. Evidence from the table suggests that the null hypothesis can be rejected: ESG portfolio does not outperform the non-ESG portfolio during the market crisis period. Evidence from the thesis differs from the results of Nofsinger et al. (2014) where they found that SRI funds outperform conventional funds during the market crisis period while the opposite was true in non-crisis period. Nofsinger et al. (2014) state that the outperformance of the SRI funds during the market crisis is driven by the screens related to shareholder advocacy and ecological, social and governance factors. As the thesis only divides companies based on their disclosure of ESG-related issues, it creates an opportunity for further research by creating portfolios

with more screens to better determine how they impact on the performance of the portfolio.

As for the previous regression, it seems that the beta explains the differences between the two portfolios. However, table 10 provides further evidence of the changes in beta coefficient. During the market crisis period, the beta is higher for the ESG portfolio while the opposite is true during the non-crisis period. One possible explanation behind the changes in beta coefficients is the sector allocation between the two portfolios. For example, portfolio containing companies dependent on international trade might be more affected by global market turmoil.

Table 10. Regression results of the two sample portfolios in different market conditions.

Portfolio	Average return	Crisis period		Adjusted R ²
		CAPM alpha (α)	Beta (β)	
ESG Portfolio	-2.831 %	-0.332 % (-0.956)	1.055*** (34.204)	0.901
Non-ESG Portfolio	-2.120 %	0.163 % (1.034)	0.963*** (37.077)	0.973
		Non-crisis period		
ESG Portfolio	1.906 %	0.219 % (1.177)	1.001*** (24.709)	0.885
Non-ESG Portfolio	1.540 %	-0.144 % (-1.122)	1.007*** (35.837)	0.942

The t-statistics are presented in parenthesis. The significance of the results is determined on 1%, 5% and 10% levels with ***, ** and * respectively.

In their research, Nofsinger et al. (2014) conclude that during crisis period, positive alphas for SRI funds are generated through positive screens rather than negative. Furthermore, Nofsinger et al. (2014) state that SRI funds differ from conventional funds also in company characteristics: SRI funds tend to hold more companies that are younger, smaller, more profitable and with lower return volatility. As the thesis differentiates

companies of the two portfolios only through sector allocation and ESG disclosure score, this opens an opportunity for further research about other company characteristics.

8. CONCLUSIONS

The concept of socially responsible investing has increased drastically over the past decade creating a demand for funds implementing different SRI strategies. In the United States, assets under management almost doubled in value in a two-year time-period from 2012 to 2014, totaling \$ 6.57 trillion (USSIF 2014). Despite the growing popularity of socially responsible investment strategies, existing research is ambiguous over the performance of SRI funds. Several studies suggest that investing responsibly creates an additional cost for investors through underperformance (Adler et al. 2008; Renneboog et al. 2008). Rapid growth of SRI funds and documented underperformance of SRI strategies raises an interesting point: if socially responsible funds underperform, then why is it becoming increasingly popular amongst individual investors? However, as stated earlier, the research around performance measures of SRI-related investing varies significantly. The main motivation behind the thesis is to contribute to the existing literature of socially responsible investing by offering a fresh perspective by introducing ESG disclosure score as a new investment screen.

The purpose of the thesis is to investigate the effect of company's ESG disclosure score on portfolio performance using data from Finnish stock market. The study is conducted by examining the returns of two equally weighted sample portfolios. Portfolios are constructed by dividing stocks listed in the Helsinki stock exchange by its ESG disclosure score provided by Bloomberg. The study seeks to determine if either of the portfolios are able to create abnormal returns during the time period of 2007 to 2016. Additionally, the performance of the portfolios is also tested against different market conditions by dividing the sample period into crisis and non-crisis periods.

Results from the study suggests that alphas for both of the portfolios are negative, close to zero and statistically insignificant. Results provide evidence that the performance differences between the portfolios are explained by beta, ie. exposure to market risk. Furthermore, the beta was higher (1.05) for the ESG portfolio suggesting that companies with ESG disclosure score are more volatile than the ones without (0.976). One possible reason explaining the difference in beta coefficients is the sector allocation of the two portfolios. During the early stages of the sample period, the sector allocation was more evenly distributed in non-ESG portfolio than ESG portfolio. Results from the regression analysis indicate that the thesis contributes to the existing literature by stating that implementing ESG screens do not lead to a significant over or underperformance. In

addition, based on the performance results, it is possible to conclude that investors do not have to pay additional cost for using the ESG disclosure score as an investment screen.

Results can be beneficial also from the firm's perspective. As disclosing company's ecological, social and governance information does not lead to a significant underperformance, it is possible for firms to disclose as much information as possible to increase transparency. In fact, number of companies disclosing ESG-related information has increased steadily over the sample period. In 2006, only 16 per cent of the companies disclosed some of the ESG information and by the end of 2015, the same number was 44.7 per cent. This highlights the increasing popularity of ESG matters amongst companies. Furthermore, as the investors are slowly taking into account the climate risk by following the carbon footprint of their investments, it is likely that companies will increase the disclosure of environmental information as it is more accurately followed.

Sample portfolio were also tested against different market conditions by dividing the sample period into crisis and non-crisis periods. Evidence from the thesis suggests that ESG portfolio generates positive alpha during the non-crisis period and negative during the crisis period while the opposite is true for non-ESG portfolio. This leads to a conclusion that non-ESG portfolio includes more defensive stocks than the ESG portfolio. The study provides possibilities for further research of other firm characteristics between the portfolios for example size and price to book ratios needed in the Fama-French three-factor model. Additionally, as the sample period of 2006 – 2016 is relatively short due to a fact that the ESG disclosure score is a new concept, the study could be repeated in the future for lengthier time period to better capture the results.

REFERENCES

- Adler, T. & M. Kritzman, (2008). The cost of socially responsible investing. *Journal of Portfolio Management* 35 (1), 52–56.
- Bauer, R., K. Koedijk & R. Otten (2005). International Evidence on Ethical Mutual Fund Performance and Investment Style. *Journal of Banking and Finance* 29, 1751 – 1767.
- Beal, Diana, Michelle Goyen & Peter Phillips (2005). Why Do We Invest Ethically? *The Journal of Investing* 14:3, 66–78.
- Bello, Zakri (2005). Socially responsible investing and portfolio diversification. *Journal of Financial Research* 28, 41 – 57.
- Bloomberg data terminal (2016). Retrieved December 12th, 2016, from Bloomberg data terminal.
- Bodie, Z. A. Kane & A. Marcus (2003). 5th edition New York: McGraw-Hill Companies Inc. ISBN: 0-390-32002-1.
- Bovenberg, A. L. (2002). Norms, values and technological change. *De Economist* 50, 521-553.
- Carhart, M. (1997). On Persistence in Mutual Fund Performance. *Journal of Finance* 52, 57 – 82.
- Datastream (2016). Retrieved December 12th, 2016 from <http://www.eui.eu/Research/Library/ResearchGuides/Economics/Statistics/DataPortal/datastream.aspx>
- Derwall J., N. Guenster, R. Bauer & K. Koedijk, (2005). The eco efficiency premium puzzle. *Financial Analysts Journal* 61 (2), 51–63.
- Derwall, J., K. Koedijk, J. ter Horst, (2011). A tale of value-seeking versus profit-driven investors. *Journal of Banking and Finance* 35 (8), 2137–2147.

- Diltz, David (1995). The private cost of socially responsible investing. *Applied Financial Economics* 5, 69-77.
- El Ghouli, Sadok, Omrane Guedhami, Chuck Kwok & Dev R. Mishra (2011). Does corporate social responsibility affect the cost of capital? *Journal of Banking & Finance* 35, 2388 – 2406.
- Fabozzi, F., K. Ma & B. Oliphant (2008). Sin stock returns. *Journal of Portfolio Management* 35: 82-94.
- Fama, Eugene (1970). Efficient capital markets: a review of theory and empirical work. *The Journal of Finance* 25, 383-417.
- Fama, Eugene (1991). Efficient capital markets: II. *The Journal of Finance* 46, 1575-1617.
- Fama, Eugene & K. R. French (2004). The Capital Asset Pricing Model: Theory and Evidence. *The Journal of Economic Perspectives*, 18, 25-46.
- Fama, Eugene & K. R. French (1993). Common risk factors in the returns on stocks and bonds. *The Journal of Financial Economics* 33:1, 3-56.
- Fama, Eugene & K. R. French (2015). A five-factor asset pricing model. *Journal of Financial Economics* 116:1, 1 – 22.
- Fehr, Ernst & S. Gächter (2000). Fairness and Retaliation: The Economic of Reciprocity. *Journal of Economic Perspectives* 14, 159-181.
- Girard, Eric, Rahman, Hamid, Stone, Brett, 2007. Socially responsible investments: goody-two-shoes or bad to the bone? *Journal of Investing* 16 (1), 96–110.
- Goldreyer, Elizabeth & David Diltz (1999). The performance of socially responsible mutual funds: Incorporating sociopolitical information in portfolio selection. *Managerial Finance* 26, 23-26.
- Grossman, B. R. & W.F. Sharpe (1986). Financial Implications of South African Divestment. *Financial Analyst Journal* 49, 62 – 66.

- Hall, J. P. (1986). Ethics in investment: Divestment. *Financial Analysts Journal* 42, 7 – 10.
- Hamilton, S. H. Jo & M. Statman, (1993). Doing well while doing good? The investment performance of socially responsible mutual funds. *Financial Analysts Journal* 49 (6), 62–67.
- Hong, H. & M. Kacperczyk (2009). The price of sin: The effects of social norms on markets. *Journal of Financial Economics* 93: 15-36
- Höffe, Otfried & David Fernbach (2010). Aristotle's Nicomachean Ethics. Akademie Verlag GmbH, Berlin. 2nd edition. ISBN: 978-90-04-17762-8.
- Markowitz, Harry (1952). Portfolio Selection. *The Journal of Finance* 7: 77 – 91.
- Nosfinger, J. & A. Varma (2014). Socially responsible funds and market crises. *Journal of Banking & Finance* 48, 180-193
- Odean, T (1998). Are investors reluctant to realize their losses? *Journal of Finance* 53, 1775-1798
- Renneboog, L., J. ter Horst & C. Zhang, (2008a). The price of ethics and stakeholder governance: the performance of socially responsible mutual funds. *Journal of Corporate Finance* 14 (3), 302-328.
- Rudd, Andrew (1981). Social Responsibility and Portfolio Performance. *California Management Review* 23, 55-61.
- Schröder, Michael (2007). Is there a difference? The Performance Characteristics of SRI equity indexes. *Journal of Business Finance & Accounting*, 34: 331-348
- Shank, T., D. Manullang & R. Hill, (2005). Doing well while doing good revisited: a study of socially responsible firms' short-term versus long-term performance. *Managerial Finance* 31 (8), 33–46

- Sharpe, William, G. Alexander & J. Bailey (1999). *Investments*. 6 ed. London: Prentice-Hall International, Inc 962p. ISBN 0-13-010130-3.
- Schueth, Steve (2003). Socially Responsible Investing in the United States. *Journal of Business Ethics*, 43:3, 189–194.
- Shefrin, H., and M. Statman. "The disposition to Sell Winners too Early and Ride Losers too Long: Theory and Evidence. *Journal of Finance* 40 (1985), 777-792.
- Slovic, P (1995). The construction of preference. *American psychologists* 50, 364-371
- Smith, T. (2005). Institutional and social investors find common ground. *The Journal of Investing* 14, 57-65.
- Soler-Dominiguez, Amparo & Juan Carlos Matallin-Saez (2015). Socially (ir)responsible investing? The performance of the VICEX Fund from a business cycle perspective. *Finance Research Letters* 2016.
- Tversky A. & D. Kahneman (1973). Availability: A heuristic for judging frequency and probability. *Cognitive psychology* 5, 207-232
- USSIF (2012). Report on US Sustainable, Responsible and Impact Investing Trends 2014. (Online). (Cited 5.12.2016). Available from World Wide Web: URL:http://www.ussif.org/files/publications/12_Trends_Exec_Summary.pdf. USSIF's website (2016).
- USSIF (2014). Report on US Sustainable, Responsible and Impact Investing Trends 2014. (Online). (Cited 5.12.2016). Available from World Wide Web: URL:http://www.ussif.org/files/publications/SIF_Trends_14.F.ES.pdf USSIF's website (2016).