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Performance of Socially Responsible Investing During Financial Crisis

Evidence from 2008 crisis

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Abstract:
Socially responsible investing (SRI) integrates environmental, social, and governance (ESG) factors into investment decisions and has gained attention as an alternative to traditional investing strategies. The performance and resilience of SRI during market turndowns and in general stable periods remain a topic of debate, as there is a lack of consensus regarding the performance of SRI against conventional methods.

The purpose of this study is to examine whether SR indices, such as MSCI KLD 400 Social and MSCI USA SRI outperformed the market portfolio S&P 500 during the financial crisis of 2008. In addition, this thesis aims to provide evidence whether these SRI investments could provide a better hedge for investors against market crashes or even act as a safe haven. Performance differences are measured and discussed with ratios such as Sharpe and Treynor and regression models Jensen's alpha, CAPM, and Fama-French 3-factor.

The study focuses on the financial crisis of 2008 and time period used in data is from 15.9.2008 to 30.9.2009, which is commonly used window for the crash. Used data is from well known sustainable indices, MSCI KLD 400 Social and MSCI USA SRI. Benchmark index in the study is market index S&P 500 and data frequence in the study is daily. Log returns are calculated from sample indices' daily total returns. Sources for data are Datastream and Kenneth R. French data library.

The empirical results of the study suggest that there are no significant performance differences between SRI portfolio and conventional portfolio and using sustainable investing strategies does not provide a better hedge against the market downturns. Study finds that multiple results from regression models are statistically insignificant and no concluding evidence of overperformance hypothesis can be found either from regression models or from performance measures. Insufficient evidence can be partly explained by narrow dataset, therefore further studies should focus on comparing different time periods, using modern SRI funds and study other market events globally.

KEYWORDS: Socially Responsible Investing, SRI, ESG, Performance, Financial Crisis, Market downturns

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1 Introduction

In past decades, socially responsible investing (SRI) has gained increasing attention as an investment strategy as investors are more aware about their surroundings and consider the impact of their investment choices regarding environment, society, and corporate governance. Also, nowadays public and politicians demand that companies' values and strategies consider responsibility aspect towards society, environment, and the stakeholders in general, which leads investors to focus on companies that are not able to only provide financial value but also have a positive effect on social welfare as well. This way investors are able to pressure corporates to consider social and environmental aspects and endorse ethical behavior along with financial performance. Due to socially responsible investing becoming one of the leading trends in the finance sector, it has also become a key subject in the field of research as the authors try to argue whether the strategy overperform conventional investment strategies or provides a stronger hedge for the portfolio against market events (Renneboog, Ter Horst & Zhang, 2008A.)

Meaning of socially responsible investing (SRI), also known as "ethical investing" or "sustainable investing", can be briefly described as an investing strategy which involves incorporating social, environmental, or ethical criteria into investors' decision-making process. Unlike traditional investing, which primarily considers financial risks and profits from stocks, funds and indices, sustainable investing addresses additional objectives, such as nature of the investment source via various strategies used within socially responsible investing (Cowton & Sandberg, 2012.) According to European sustainable investment forum (Eurosif, 2018), sustainable investing can be described as a long-term oriented investment approach integrating ESG factors in the research, analysis, and selection process of securities within investment portfolio.

ESG is a term often used alongside socially responsible investing and, in some way, can be seen as a synonym or at least in a very close relationship with SRI. ESG stands for environmental, social, and governance and like SRI, it also focuses on how the above-mentioned factors affect the performance of investments and includes those factors in

investment decision-making process via various strategies (Giese, Lee, Melas, Nagy & Nishikawa, 2019.) It is also important to acknowledge the term CSR, which addresses responsibility and sustainability from the corporates' point of view. According to Wang, Tong, Takeuchi & George (2016), the concept of CSR (Corporate Social Responsibility) refers to the idea that companies have responsibilities and obligations to society and wider group of stakeholders beyond companies' own shareholders. CSR involves companies in the field of responsible investing and unites the objectives and values with investors and corporates.

Socially responsible investing is a frequently used term that gained popularity in the 1980s and 1990s, though its origins extend back hundreds of years, influenced by civil rights-era intellectuals, faith-based organizations, and women. It can be seen that SRI embodies a set of values that have evolved from religious doctrines at the fringes of historical records to address challenges such as social justice, climate change and corporate governance concerns. The method of investing responsibly has rapidly grown and today SRI's advocates include analysts at Wall Street companies, financial engineers, pension trustees, retail investors and so on. What once was a niche activity managed by a handful of companies, modern responsible investing strategy has evolved into a worldwide phenomenon influencing discussions on fundamental stock research, mandatory disclosures for stock exchanges, credit ratings and global accounting standards (Townsend, 2020.)

As mentioned, SRI has grown rapidly in past years and gained popularity as investors are seeking ways to impact positively to the world and seeing SRI as a legitimate tool to do so. Investors aligning their own values and motives with investment decisions has been a major factor in the growth of SRI and according to The Global Sustainable Investment Alliances (GSIA) review 2022, there is $30,3 trillion invested globally in sustainable investing assets. According to GSIA report, sustainable investment assets under management has grown in non-US markets by 20% since 2020 while at the same time the assets labelled as "sustainable" has decreased (GSIA, 2022).

In general, it can be argued that matters or issues causing the SRI to be a popular and relevant topic in the 21st century can be identified as e.g., global awareness of climate change, racial and social justice movements, regulatory changes and government initiatives, and investor demand. Especially younger generations are more aware of the above-mentioned topics which affects greatly to the demand as stated earlier. Some studies also suggest that sustainable investing and SRI portfolios provide greater profits and better performance than conventional investments or funds, thus gaining its popularity among investors (Kempf & Osthoff, 2007). However, more recent studies argue that there is no evidence of SRI funds outperforming conventional funds (e.g. Revelli & Viviani, 2015).

Concerns among investors regarding socially responsible investing can be roughly identified as the absence of clear definitions around the terminology and classification of sustainable assets (Friede, 2019). According to Avetysian & Hockerts (2017), another main issue with sustainable investing involves the lack of standards for investments and availability of SRI related data. e.g., Above mentioned factors have caused authors to find significant diversity in understanding of SRI and ESG among investors but also issues and reliability problems regarding ESG metrics (Höchstädter & Scheck, 2015; Semenova & Hassel, 2015).

As a result of the growth of the trend, many new services and companies have emerged, which may even opportunistically take advantage of the sustainability perspective. However, the demands for companies regarding sustainability matters have also increased in recent years, forcing them to use various consulting services to address their needs and possible issues with sustainability related questions. Many companies and entrepreneurs find this challenging and may have a negative attitude towards sustainability due to increased reporting and other responsibility related requirements or matters. For example, from 2024, some companies will be required to include sustainability reporting separately in their financial statements in Finland, which will

significantly increase their reporting obligations and create new opportunities e.g., for companies offering consulting services and auditors.

In 2008, multiple financial institutions went bankrupt or were bailed out by governments causing the global credit and stock market to nearly collapse. The crisis in 2007-2008 is well known to be the worst crisis in the field of finance since 1930's Great Depression, which led to high unemployment rates and market crash in general. Studies have identified the main factors for 2008 financial crisis from macroeconomics, those being loose monetary policies, regulations, and complex securitizations especially in the housing markets (Erkens, Huns & Matos, 2012; Taylor, 2009.)

Researchers have tried to accomplish an understanding of the relationship between responsible investing and financial performance with mixed conclusions. Some studies suggest that 2008 financial crisis boosted the trend of socially responsible investing and consideration of ESG factors in investment decision making process among investors (Yingxu, 2020). Therefore reasonably, studies such as Becchetti, Ciciretti, Dalo & Herzel (2015) have also focused on the performance of sustainable investment methods during crises and whether it is possible to provide stronger hedge against unexpected market events with responsible investing strategies. Lins, Servaes & Tamayo (2017) also argue that companies incorporating CSR had better financial performance and greater stock returns than more conventional companies during the 2008 crisis. This finding suggests that it is highly possible to earn higher profits or a stronger hedge with responsible portfolio in the time of financial crises due to the close relationship between CSR and SRI. More recently, studies have also found a connection between responsible investing strategies and crisis caused by Covid-19 in the 2020s. Diaz, Esparcia & Lopez (2022) finds that including ESG factors into investment strategy, more sustainable portfolio outperformed conventional portfolio during Covid crisis according to traditional performance measures.

1.1 Purpose of the study

The purpose of this study is to examine whether socially responsible investing strategies provide stronger hedge for the portfolio against unexpected market events. This study uses evidence from the 2008 financial crisis as it remains one of the most critical events affecting the financial market to this day causing devastating losses of dollars and euros all around the world. This study focuses only on the time period during the crisis. Therefore, the objective is to test if sustainable investing strategies would have hedged the portfolio better than conventional ones and created less damage profit wise for the portfolio during financial crisis. While there is no clear academic consensus on the topic, some studies have identified a positive correlation between SRI and financial performance — particularly during periods of crisis (Lee & Lu 2021).

Additionally, this study tries to provide a comprehensive understanding around the research topic by reviewing past literature. The objective of the study is also to examine the evolution and history of socially responsible investing by giving an extensive overview and summary from previous studies. Since the purpose of the study is to examine socially responsible investing performance during the financial crisis in 2008, it is necessary also to include an overview and brief literature review of the financial crisis to accomplish full understanding of the research topic.

Thesis' empirical study part will compare the performance of indices considered sustainable and indices considered as more conventional during selected period with different metrics, such as Sharpe and Traynor's ratios, CAMP (Capital Asset Pricing Model) and Fama & French 3 factor model. These are commonly used methods in previous studies, such as Nofsinger & Varma in their 2014 study where they study whether SRI mutual funds are able to outperform conventional mutual fund during selected time period of market crisis.

Time frame of the study starts from September 15. 2008 and ends on June 30. 2009. These milestones are considered widely as the beginning and ending of financial crisis

as in September 2008 Lehman Brothers went bankrupt and June 2009 National Bureau of Economic Research (NBER) considers as the most accurate endpoint. Between 2008 and 2009, the field of sustainable investing was still relatively niche and the variety of ESG related indices were not that vast, multiple ESG focused indices and funds were established and recognized. This thesis will use historical data of popular indices considered as applicable for ESG investors from 2008 and 2009, other being commonly known MSCI KLD 400 Social Index. Indices focus on North America; thus, the benchmark of the thesis is S&P 500 which reflects the market returns of North America.

1.2 Hypothesis

As previous studies show, there are two prevailing theories regarding the performance of socially responsible investing. Renneboog, Ter Horst & Zhang (2008) argue that SRI portfolios may underperform conventional portfolio in a short time basis but also claims that companies incorporating CSR values are able to create value to shareholders in the long term. Frost, Jones, van der Laan & Loftus (2008) also support Renneboog et. als. underperformance hypothesis by stating that responsible portfolio does not perform better than conventional portfolio based on raw and risk adjusted returns over 30-year period.

Meanwhile Lean, Ang & Smyth (2015) argue that SRI portfolio outperforms conventional portfolio in North America and Europe measured by multi-factor model. Another study by Le Maux & Le Saout (2004) supports outperforming theory by finding that in majority of cases responsible indices perform better than their comparative benchmarks measured with Sharpe ratio and Treynor index.

There is also a third viewpoint of SRI performance which states that in fact the performance of SRI portfolio does differ from conventional portfolio in many ways. Bello (2005) finds that there are no diversification differences between those portfolios

suggesting similar risk characteristics. Bello also finds that both SRI and conventional portfolios, historically underperform the S&P500 index.

In the light of the previously mentioned findings, it can be argued that the performance of SRI compared to conventional investing strategies is contradictory and previous research can be seen as conflicting. This study aims to take previous studies into account and furthermore establish an understanding of the performance during unexpected events in market such as the financial crisis in 2008. Previous study of the research topic suggest that socially responsible investment strategy would be able to provide better hedge against market crisis (Bechetti et. al., 2015)., thus hypothesis of this thesis are as follows:

H1: *Socially responsible investing portfolio provides better hedge during 2008 financial crisis than conventional portfolio.*

Main objective of the study is to determine the performance hypothesis from the investors' viewpoint via studying the SRI portfolio performance during crisis. Due to SRI's close relationship with CSR and ESG, it is also practical to address the research question from the companies' performance viewpoint during crisis. The following hypothesis can be concluded via the same methodology and study as H1:

H2: *Companies incorporating CSR and with high ESG scores outperform their comparative benchmarks during the 2008 financial crisis.*

To conclude, the main research question for the thesis is: During the financial crisis in 2008, did SRI indices considered sustainable outperform conventional index that reflects market returns in North America?

1.3 Structure of the study

Firstly, this thesis explores the theory and history of socially responsible investing and provides an overview of the main strategies used among SRI. Thesis also addresses previous studies of the performance of SRI and introduces key performance measures and financial theories related to empirical research.

Secondly, it is necessary to give a brief overview of the 2008 financial crisis since empirical research occurs during that period. Additionally, the thesis provides prevailing findings from previous studies related to stock and market performance during the crisis.

Thirdly, the thesis presents the data and methodology used in empirical research. Also, relevant theoretical aspects related to research are introduced in the thesis. In the final chapters, this study presents results of the research and tries to provide a conclusion of the findings from empirical research.

2 Socially responsible investing

2.1 History of SRI

As mentioned above, SRI traces its history back hundreds of years influenced by the civil-rights era, women's rights activists and much more. Although the term "Socially responsible investing" has gained its most popularity in the 21th century, it became a well-known term already in the 1980s and 1990s.

Conventional SRI was significantly shaped by the revolutionary decades of 1960s and 1970s, when antiwar movement and the majority of movements on racial equality, womens' rights, and protection of consumers and environment occurred. In the 1970s, there were no screening methodologies or any other more advanced or specified strategies for responsible investing. Rather it was faith-based values which guided the behavior of investors and resulted in creation of the first mutual funds which adapted the faith-based values and environmental concerns as a sort of guideline for investment decisions (Townsend, 2020.)

By the 1980s, socially responsible investing gained some standardization as an investing strategy to some extent. Common method was acknowledged, and behavior of responsible investors was driven by strategy of creating a portfolio that follows broad market movements without including sectors such as alcohol, tobacco, weapons, gambling, pornography, and nuclear energy into portfolio. Strategy is well known as "Screening", which uses investors values as they generate negative screens in order to avoid unethical or unsustainable investment instruments and sectors. Screening is considered to be the backbone of the typical socially responsible investing strategy and process (Townsend, 2020.) More on strategies of responsible investing in 2.3.

In the 1990s investors increasingly recognized the importance of including environmental, social and corporate governance factors in the decision-making process alongside financial returns and performance. The significant event of 1990s in the field

of responsible investing was the founding of the Global Reporting Initiative (GRI) in 1997 in the aftermath of the environmental damage of the Exxon Valdez oil spill which occurred eight years earlier. The purpose of the GRI was to create sustainability reporting guidelines for companies which would help investors with standardized ESG data in order to make informed investment decisions. In 2024, GRI is one of the leading institutes of sustainability and impact reporting which provides the most widely used sustainable reporting standards of topics ranging from taxes to diversity and equality (Global Reporting.)

By the 2000s, more demand for SRI and ESG related analysis and research were pushed by the aware investors. One of the main reasons for increasing demand was discussion on the relationship between fiduciary duty and challenges of sustainability as it was seen as an unanswered topic and an area of improvement. Another of the main drivers was climate change as climate scientists and the public gathered more awareness and concern of the future regarding environment and climate. The third catalyst for rising demand was the growing awareness of the relationship between poor corporate governance and financial performance in the markets. For instance, lack of corporate governance and unethical behavior was in the core of 2008 subprime crisis as ethical or responsible behavior in general was not one of the factors to consider among the lenders and the banks (Townsend, 2020.)

Another significant milestone in the evolution of Socially Responsible Investing (SRI) was the launch of the Principles for Responsible Investment (PRI). In 2005, then United Nations Secretary-General Kofi Annan invited leading institutional investors worldwide to collaborate on creating these principles. Principles include six key points which all encourage investors to consider sustainable values in their investment decision making process (PRI 2020.)

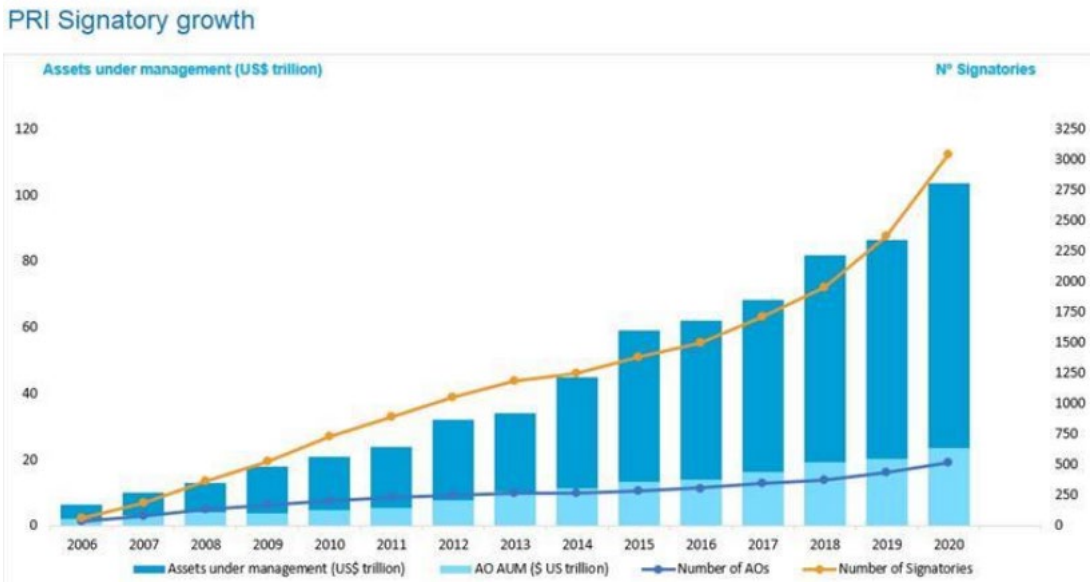

Figure 1 PRI growth through years (PRI 2020)

In 2010s, Eurosif SRI study (2010) argues that responsible investing experienced a transformative period as responsible investing had significant growth in popularity and assets under management, which were approximately €5 trillion at the end of the 2009. Growth comes with it challenges and the discussions regarding definitions of SRI or sustainable investing was a relevant and popular topic in the 2010s among investors and governments. Study uses the following phrase as a definition of SRI:

> *"A generic term covering any type of investment process that combines investors' financial objectives with their concerns about Environmental, Social and Governance (ESG) issues."*

Decade was also a crucial test for SRI as it is the decade for global financial crisis and Eurosif study states that responsible strategies showed remarkable resilience despite the downfall in markets. All said, it can be seen that SRI strategies gained more popularity and established a respectable and serious role in the world of finance.

In recent years, 2020 and forwards, the finance world and SRI faced another challenge with covid pandemic as it had a significant effect on the stock markets and to businesses in general. Disregarding the pandemic, in 2020s SRI gained even more popularity and growth, but simultaneously faced largely more criticism. According to statistics from

World Economic Forum, assets under management of ESG and SRI strategies were approximately $8,4 trillion at the end of 2022, indicating significant growth in the past 10 years.

Criticism around SRI and ESG related matters in recent years can be identified with regulatory factors, standardization, fraudulent behavior and even its relevance. Many investors' views are that companies' sole purpose is to provide financial value and ESG is seen as a public-relations move or as an effort to boost the brand. Ultimately, companies involving ESG in their operations and business can be accused of "greenwashing" or "woke washing", which concisely refers to fraudulent behavior or opportunistic seek of advantage using ESG related matters as a tool in communications towards stakeholders. Another rising critic related to relevance is that there is still no concluding evidence whether investing responsibly offers better returns over traditional investing strategies (Perez, Hunt, Samandari, Nuttall & Biniek, 2022.) This results in skepticism among investors and some reactions from companies have already happened, e.g. Nordic digital bank Nordnet deleted "ESG" term from their traditional index fund names, as there was no abnormal relation to ESG in the funds following for example OMXH 25.

2.2 Defining SRI

The most comprehensive definition of socially responsible investing (SRI) comes from the 2018 European SRI Study conducted by the European Sustainable Investment Forum (Eurosif, 2018):

> *"Sustainable and responsible investment ("SRI") is a long-term oriented investment approach which integrates ESG factors in the research, analysis and selection process of securities within an investment portfolio. It combines fundamental analysis and engagement with an evaluation of ESG factors in order to better capture long-term returns for investors, and to benefit society by influencing the behavior of companies."*

Many researchers share similar perspectives on responsible investing. Renneboog et al. (2008A) defines socially responsible investing (SRI) as an investment approach that incorporates social, environmental, and ethical considerations into decision-making processes. Auer et al. (2016) expand on this definition, highlighting that it also involves identifying companies with strong corporate social responsibility (CSR) performance, which is assessed based on environmental, social, and corporate governance (ESG) criteria. While the exact definition of SRI remains elusive, researchers have identified commonalities to aid investors in understanding this evolving concept.

As mentioned, socially responsible investing (SRI) refers to the integration of ethical, environmental, social, and governance (ESG) considerations into investment strategies. According to Sandberg et al. (2009), SRI is characterized by the intentional selection or exclusion of assets based on their compliance with specific ethical or sustainability criteria. It aims to align investment portfolios with the values and principles of the investor while still pursuing competitive financial returns.

Bauer and Hann (2010) highlight that SRI combines traditional financial analysis with non-financial ESG criteria to support investments in companies that promote sustainable and socially responsible practices. Furthermore, Friede, Busch, and Bassen (2015) emphasize that SRI is not only about ethical alignment but also about recognizing the long-term financial benefits of sustainable business practices.

Complicating the definition further are the various synonyms often used interchangeably with responsible investing. Terms such as socially responsible investing, ethical investing, and sustainable investing are frequently treated as equivalent in many studies. However, some literature distinguishes ethical investing from responsible investing. Hyrske, Lönnroth, Savilaakso, and Sievänen (2012) argue that responsible investing has its roots in ethical investing, with differences arising in expected returns, investment philosophies, and the tools employed in the process. Despite these nuances, academic literature often

uses these terms synonymously, and this thesis treats ethical investing, sustainable investing, and socially responsible investing as the same term.

2.2.1 Performance measures of SRI

Responsible investments can be measured in multiple ways. The first and traditional measure for responsible investments and any other investments is metrics for financial performance. Financial performance can commonly be measured e.g. with risk-adjusted returns, benchmark comparison or tracking error. Tools such as Sharpe ratio, Treynor ratio and Jensen's alpha are typical methods for assessing risk-adjusted returns and help investors to evaluate whether e.g. SRI portfolio outperforms or underperforms compared to conventional portfolio via risk and return factors (Fama 1972).

Another simpler way of measuring performance is to compare portfolio returns with selected benchmarks. For SRI portfolios, used benchmarks can vary from traditional S&P 500 index to more sustainable based benchmarks such as MSCI's ESG indexes or Dow Jones Sustainability Index (Reilly 2002.)

For some investors, other than financial performance can be a key factor in decision making process. Especially among SRI investors, financial performance is an important driver, but non-financial performance measures are highly valued, such as ESG ratings or target company's carbon footprint. These performance measures and reports can be used in a screening process to exclude specific companies or shares out of the personal investment universe, thus narrowing the portfolio of possible investments with a non-financial performance metric (Renneboog et. al 2008A).

More recent methods combining above-mentioned financial and non-financial performance are dual financial-impact metrics. e.g. Social Return on Investment (SROI) provides an estimate of the financial value of environmental benefits created by the portfolio compared to the cost of the investment. SROI is considered as a similar analytical approach as a cost-benefit analysis where analysis tries to consider different

impacts in evaluating organization activities. SROI consists of six stages: identifying key stakeholders, mapping outcomes, providing evidence for outcomes, determining impact, calculating the SROI, and, reporting, utilizing, and embedding the report (Pathak & Dattani 2014.)

This thesis concentrates on financial performance and ignores any possible metrics for non-financial performance indicators and benchmarks. To conclude, financial performance measures and metrics in socially responsible investing do not differ from conventional investment strategies and metrics such as Treynor's ratio, Jensen's alpha and Sharpe ratio are as effective tools for indicating performance in the field of SRI as it is for any other investments and this thesis will introduce main models in later chapters.

2.2.1.1 Modern portfolio theory and SRI

One relevant theory around performance of SRI is the modern portfolio theory (MPT) introduced by Markowitz (1952) as the theory states that investors should maximize long-term term returns via diversification and reduce the risk of investments similarly. The issue recognized between the relationship between SRI and modern portfolio theory relates to screening process, as investors using screening strategies exclude investment opportunities out of their investment universe, thus facing smaller pool of instruments to choose from. According to Le Maux & Le Saout (2004), in theory responsible investors would underperform against the markets in the long term since they are not able to utilize diversification in full potential. Below presented figure represents the decreasing investment universe SRI investors face as using screens in the decision-making process. The effect of screening process to investment universe can be seen in figure 2.

As stated above, according to Markowitz, investors' main objective is to maximize expected returns on investments and minimize risk via diversification. In MPT, the relationship between the risk and return is measured with said expected returns and the formula is presented below in equation (1).

$$R = \sum_{i=1}^{N} X_i R_i \qquad (1)$$

Where: $R =$ Return of the portfolio

$X_i =$ Amount invested in asset i

$R_i =$ Return of asset i

The relationship between SRI and MPT has been studied by multiple authors. Girard, Rahman & Stone (2007) argue that since MPT is based on diversification and responsible investors are not able to fully optimize diversification while using excluding screens, responsible portfolios should face diversification costs in some level. Meanwhile, Diltz (1995) argues that excluding instruments from investing universe does not affect the performance of responsible portfolios since the size of investment universe is relevantly large and stock markets are efficient with good liquidity. Thus, it can be seen that empirical findings around the relationship between MPT and SRI are mixed, as some studies find no significant performance penalty using SRI. Another relevant theoretical background is introduced in chapter 5.

2.2.2 Motives for SRI

As mentioned above, some studies argue that mathematically and theoretically using responsible investing strategies may have a negative effect on the returns of the portfolio. Thus, it is relevant to introduce main motives for responsible investing, as it might be against the common investing theories in respect of the objective being to maximize profits.

Commonly and widely used and known capital asset pricing models (CAPM) assume that the main driver for investors is to solely seek investments that maximize profits which is contradicting with socially responsible investing strategies, as these strategies do not utilize diversification in full potential. However, multiple authors find that investors'

behavior against CAPM can be reasoned with different motives or drivers. According to Renneboog et al. (2008), investors using responsible investing strategies are simply different from other investors. Statman (2004) also states that not all investors seek only monetary values, but rather all investors also consider expressive benefits in their investment strategies.

Bollen (2007) simplifies the motives for SRI investors stating that they seek nonfinancial benefits with their investment decisions, such as having an impact on society or environmental issues via their portfolio. Also study by Eurosif (2018) states that the main driver for responsible investing is the investors' motivation to address climate change and other environmental issues. It can be seen that non-monetary values are the main drivers or motives for usage of SRI and Bauer & Smeets (2015) and Trinks & Scholtens (2017) concludes that social identity and social beliefs among investors plays an important role in choosing responsible investing as an investment strategy.

Furthermore, Scholtens & Willard (2024) categorizes responsible investors' motives into four separate drivers, which are financial, deontological, consequentialist and expressive motives. These can be viewed also as a method to utilize the motives into action. Financially driven responsible investors expect that superior responsible performance generates financial outperformance, which is this group's motive for SRI. Deontological investors drivers are to exclude unethical or controversial investments in relation to their own values as they do not seek to benefit from or be associated with problematic industries or companies. Consequentialist investors' motive is to influence companies' behaviour as their aim is to make capital more expensive for irresponsible companies meanwhile get cheaper funding for responsible companies. This is achievable by investing in companies with high ESG or responsibility scores. Expressive responsible investors are driven by building their own identity or brand, as they try to affect their identity by selecting responsible companies or assets into their portfolio.

In relation to different motives for responsible investing and performance of the investments, Scholtens & Willard (2024) find that differences in investors motives do not significantly affect the financial performance of the responsible portfolio. To conclude the findings of multiple studies, main drivers for responsible investing is not only to seek financial returns, but to align the investors' portfolio with their own values which are commonly non-financial attributes in the field of SRI.

2.3 SRI strategies

There are various ways how investors can incorporate Socially Responsible Investing (SRI) into their decision-making and company selection processes. The European Sustainable Investment Forum (Eurosif, 2018) categorizes SRI strategies into seven types, briefly presented in Table 1 and discussed shortly in the following chapters. Other researchers, such as Schueth (2003), highlight three commonly recognized strategies: screening, shareholder advocacy, and community investing, where screening is considered to be a commonly known strategy for responsible investors. These approaches often overlap with Eurosif's categories—for instance, shareholder advocacy closely aligns with the engagement and voting strategy, while screening serves as a foundational element in most of the strategies as it is considered to be a starting point or a base for a process in sustainable investing process.

Sustainability themed investment	Focuses on specific thematic sustainability related themes, such as green energy or healthcare
Best-in-Class	Refers to positive screening where investors seek companies that performs well on ESG criteria
Exclusion	Refers to negative screening where investors exclude companies or sectors out of their investment universe
Norms based screening	Investors incorporate commonly known standards and norms into investment decision making, such as UN Global Compact principles
ESG integration	Investors integrate ESG factors into traditional financial analysis, where ESG related matters are not solely the base of investment decision
Engagement	Also referred as shareholder advocacy, where investors actively try to influence companies to incorporate better ESG practices
Impacting investing	Strategy where investors seek to generate measurable positive impact on sustainability matters and financial profits

Table 1. SRI strategies according to Eurosif 2008

2.3.1 Sustainability themed

With this strategy, investments are chosen by themes which are related to ESG topics or ecological and social issues like climate change, sustainable farming, eco-efficiency, green buildings, gender equality and more. The focus in determining sustainability themed investments is to comprehend how investment decisions are able to help positively with the above-mentioned ESG themes or issues (PRI 2022.) Furthermore, study from Busch, van Hoorn, Stapelfeldt & Pruessner 2022 suggests wider understanding for sustainability themed investments that involves also double materiality perspective rather than just financial perspective. Therefore, according to Busch et.al., sustainability themed investment strategy can focus on generating positive impact while managing risk and opportunities arising from ESG.

Some SRI strategies are considered as direct investments and others are considered as indirect investments. Sustainability themed investing and impact investing are ideologically similar strategies, the difference being that sustainability themed investments are known as indirect investments. Investors practicing sustainability themed strategy allocate their funds into assets that are involved in developing sustainable practices, such as above-mentioned issues related to climate change. Indirect investments in this scenario refer to the way of allocating the assets as investors transfer their assets to organizations by selling or buying different instruments from other investors or markets (Schueth, 2003.)

2.3.2 Screening

Three strategies in table 1 can be categorized as strategies that primarily use screening method to help investors' decision-making process, and these are best-in-class, exclusion and norms-based screening. The main purpose for investors to use screening is to ensure that their personal values and ESG related investing criteria are considered in the assets

they invest in. Core idea of the screening process is to select different criteria that reflects investors values and screen assets or organizations that fulfil or does not fulfil those criteria. Typical criteria for screen selections are for instance gambling, tobacco, alcohol, nuclear power and weapons and these screens are an example for negative screening also referred as exclusion strategy where these organizations related to above mentioned matters are excluded from portfolio or from investment universe (Lee, Humphrey, Benson & Ahn 2010; Wallace 2018.)

As briefly referred above, screening strategies can be categorized as positive or negative screening. From above mentioned strategies, best-in-class fall under positive screening and exclusion and norms-based screening under negative. According to Humphrey & Lee (2011), investors either include or exclude holdings to their portfolio depending on companies' behavior or involvement in certain industries or activities through screening process. Positive screens may include stocks of companies that e.g. are associated with renewable energy or have advanced hiring processes related to equality. Commonly negative screens include activities or industries viewed as undesirable, such as companies involved with alcohol, tobacco, gambling or weapons. These industries or companies are excluded from the investment universe through negative screening. Most common exclusion criteria are presented below in figure 2.

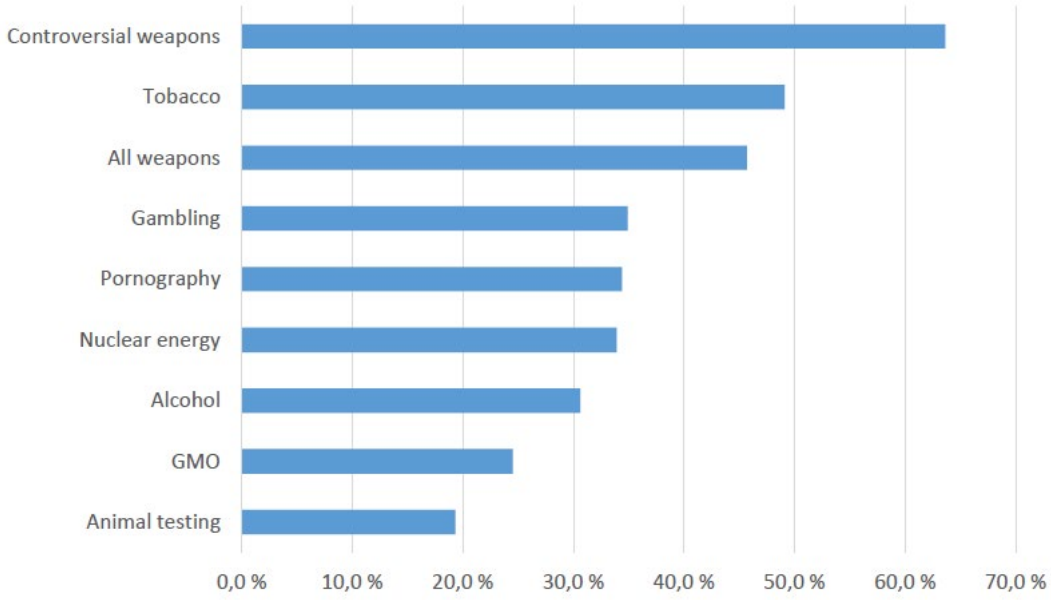

Figure 2. Commonly used exclusion criteria (Eurosif, 2018)

Performance wise, Humphrey & Lee (2011) assess that strictness of positive or negative screening and number of used screens does not have significant effect on the returns of the screened portfolio. However, they do find slight evidence that more highly screened portfolios or funds achieve higher risk-adjusted returns on the investment. Furthermore, Henke (2016) argues that screening strategy, specifically excluding companies with low ESG scores, is a successful strategy during crisis times.

As earlier discussed, modern portfolio theory and SRI, specifically screening strategy, conflict with each other as MPT suggests that investors should aim for maximum profits through diversification meanwhile screening process decreases the possibilities for diversification by shrinking the investment universe. This is presented in figure 3 below by study from Barnett & Salomon, visualizing the effect screening intensity to diversification possibilities. However, Barnett & Salomon (2006) also finds that even though screening process reduces the range of investment options, it can still improve financial returns when applied effectively as the strong performance of carefully selected companies may offset the costs of decreased diversification in portfolio.

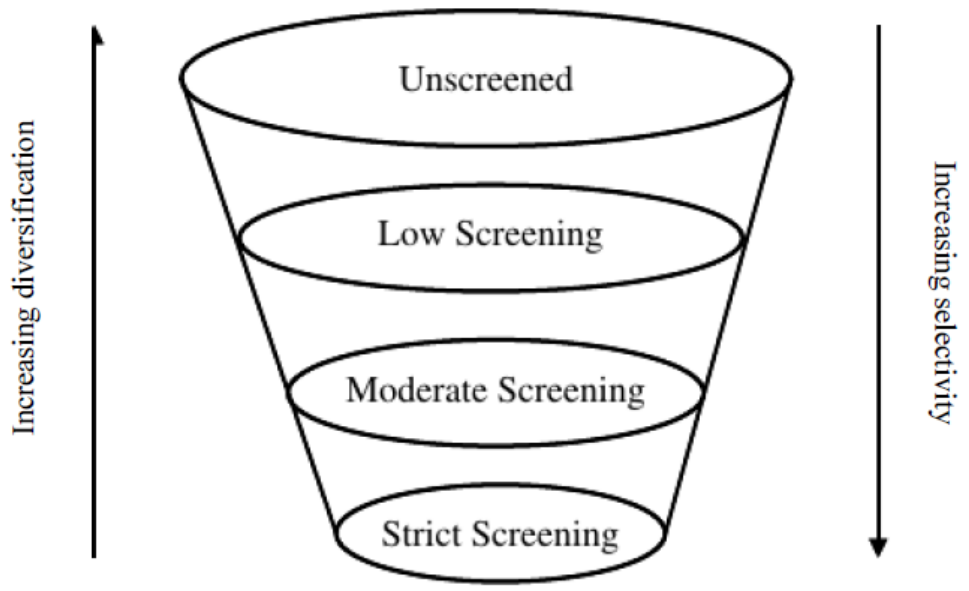

Figure 3. Decrease of investment options with screening strategy (Barnett & Salomon 2006)

2.3.3 ESG integration

ESG refers to environmental, social, and corporate governance factors, and incorporating these considerations into financial analysis and decision-making has become the most rapidly expanding approach in within socially responsible investing (Eurosif, 2018). Furthermore, Hyrske et al. (2012) states that common financial measures ESG factors are incorporated in this strategy are net profit, quick ratio and return on equity. UNPRI (2020) describes ESG integration as follows:

> *"ESG factors are integrated into absolute and relative valuation models alongside all other material factors. Investors can adjust forecasted financials (such as revenue, operating cost, asset book value and capital expenditure) or company valuation models (including the dividend discount model, the discounted cash flow model and adjusted present value model) for the expected impact of ESG factors. "*

According to UNPRI (2020), key feature of ESG integration strategy includes identifying relevant ESG issues and evaluating how these issues may relate to the financial performance of the chosen investment. Also, combining financial and ESG measures and

identifying relevant ESG matters may offer better opportunities for identifying market trends and risks.

2.3.4 Engagement / Shareholder advocacy

As described in table 1, SRI strategy related to engagement activities allows investors to have or try to have an influence on companies' matters related to sustainability and ESG and it is also a widely used strategy in the field of SRI. The aim of the strategy is for investors to positively contribute to invested companies' business models in order to generate more responsibility and sustainability with active relationships (Eurosif, 2018.) PRI (2015) defines engagement strategy as follows:"

> *" Engagement refers to interactions between the investor and current or potential investees on ESG issues. Engagements are undertaken to influence (or identify the need to influence) ESG practices and/or improve ESG disclosure."*

Scholtens (2014) describes engagement strategy as active ownership of the invested company. Via active ownership, investors are able to steer above-mentioned business decisions and companies' behavior towards sustainability through voting and active communication. For example, actively engaging investors may try to change the board of the invested company in a way that members' attitudes and values are more in line with investors.

Although engagement strategy is rapidly growing and popular strategy among SR investors with over four trillion euros asset under management in 2017 (Eurosif, 2018), relatively few studies have shown interest in the performance of the strategy. However, Wagemans, van Koppen & Mol (2018) suggest that effective engagement may lead to better performance, but effectiveness of the engagement is dependent on multiple factors, such as investees culture and attitudes which are difficult to measure. To demonstrate the rapid growth of engagement strategy in the 2010s, figure 4 below presents the assets under management through 2009 and 2017.

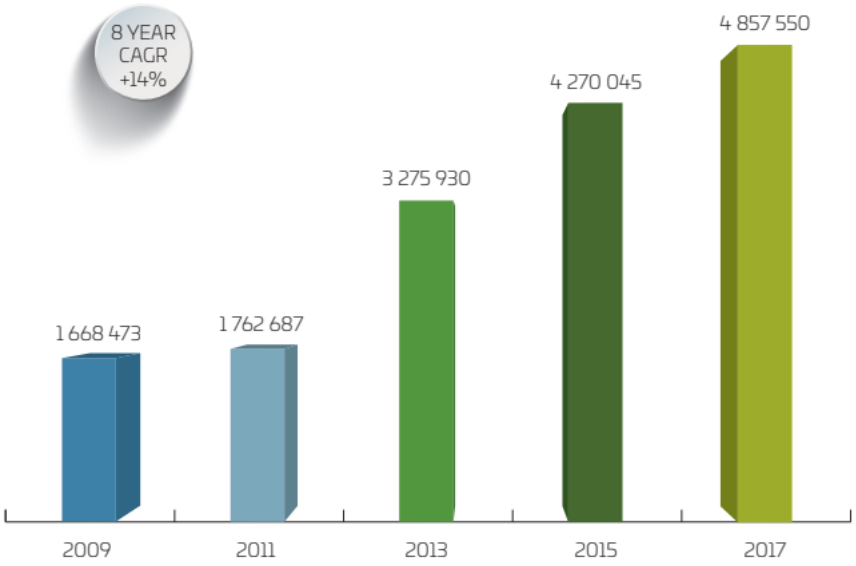

Figure 4. Growth of shareholder advocacy in € AuM (Eurosif, 2018)

2.3.5 Impact investing

Like every SRI strategy, also impact investing experienced significant growth and gained popularity in 2010s. Impact investing has similar characteristics with engagement strategy, as it also focuses on generating positive impact on social and environmental issues through investor's own efforts. As said, the aim for the impact investor is to generate measurable positive effect on relevant responsibility issues without compromising the financial return. Strategy can also be referred as "investing with purpose" as assets are allocated towards companies addressing global challenges (Eurosif, 2018.)

Meanwhile, Agraval & Hockerts (2021) claims that impact investing differs from other SRI strategies and has six specific characteristics to explain the difference. Agraval & Hockerts argue that from the following six defining features, impact investing differs from SRI in at least two of these features:

1) Capital invested
2) Level of engagement with investee
3) Selection process

4) Social and governance outcomes
5) Outcome reporting
6) Government involvement

Barber, Morse & Yasuda (2021) study the performance of the impact investing and find that considering various characteristics, impact funds earn financial returns 4.7% points lower than conventional venture capital funds. They also expand that impact investors are on average willing to give up expected returns on investment with their chosen strategy, but finding is dependent on investors' e.g. political and regulatory pressure.

3 Financial crisis 2008

3.1 Overview and impact on financial markets

It is relevant for the thesis to shortly introduce the crisis in 2008 to fully understand the results and potential implications of this study. The 2008 crisis, also known as “Great Recession” represents one of the most significant global economic downturns since the Great Depression. Crisis originated from the U.S. housing and financial markets, and it quickly spread across the world causing instability and leading to major policy actions worldwide (Kalleberg & von Watcher, 2017.)

The crisis began with the bursting of U.S. housing bubble which was fueled by low interest rates, excessive subprime mortgage lending, and loose regulation. Financial institutions, such as banks, took on excessive leverage while distributing risk via complex mortgage-backed derivatives and securities. At the same time, housing prices began to decline which led to rising mortgage defaults and expressive financial stress. Weak regulations and poor governance worsened bank vulnerabilities, while low capital, short-term funding and missing safeguards affected the risk and rise of the crisis (Financial Crisis Inquiry Commission, 2011; IMF, 2009.)

In 2008, Bearn Stearns collapsed in March and Lehman Brothers went bankrupt in September, which is considered to be the starting time of the crisis by many studies (Kalleberg & von Watcher, 2017). These two major failures triggered significant market panic and liquidity shortages, which caused U.S. government to react with several regulatory and political acts eventually leading government to purchase failing assets and flowing capital into banks (Financial Crisis Inquiry Commission, 2011).

The recession lasted 18 months, making it the longest downturn since the Great Depression. The aftermath of the crisis lasted for years, but according to NBER and other studies, the ending point of the crisis is widely considered to be June 2009 (Kalleberg & von Watcher, 2019.)

The crisis had multiple severe impacts on the markets, such as global unemployment. According to Davis & von Watcher (2011), global job losses were over 200 million by 2009, with unemployment rates in the U.S. rising to 10,1%. Another serious effect was on the households, as consumers' wealth decreased approximately by more than 25% including assets such as pension savings, housing equity, and general savings. U.S. federal banks also state that overall stock prices fell approximately 50% from peak at the time of the crisis (Financial Crisis Inquiry Commission, 2011.) Apart from the obvious critical financial and economic issues downturn caused, McInerney, Mellor & Nicholas (2013) remind that the crisis also affected individuals' mental health leading to spike in depression and societal stress among consumers.

The crisis reshaped the financial environment for good and e.g. financial regulation and risk management became stricter. Investors became more aware of the importance of matters such as transparency and resilience, which partly factored in the awareness of sustainable finance and informed investment decisions (IMF, 2009.) Herrera-Cano & Gonzales-Perez (2016) even argue that SRI rose from niche to mainstream strategy in the aftermath of the crisis, since investors seek more trustful tools against the markets.

3.2 Financial crisis and stock performance

According to Slimane, Mehanaoui & Kazi (2013), the global equity market declined from $64 trillion to approximately $49 trillion during crisis totaling to 22% decrease which indicates in nearly 25% drop in global GDP. Kaizoji & Miyano (2016) study the cheapness of the stock markets during crisis and find that stock prices were significantly undervalued relative to company fundamentals. Meanwhile, Manda (2010) highlights that S&P 500 index lost approximately 56% of its value from October 2007 to March 2009. Manda also mentions that the stock market volatility rose from 13,4% to 43,6%. To conclude, several studies show that stock performances across different fields and sectors plummeted or experienced a significant decrease during the crisis.

Different investing strategies and assets may experience different exposure to events in markets, such as time periods in crisis. There is inconsistent evidence of how sustainable investing strategies perform against conventional investment strategies overall and similar trends seem to be valid during market downturns. As Nofsinger & Varma (2014) demonstrate, U.S. SRI mutual funds during 1980-2019 outperform their conventional benchmarks during bull market, meanwhile during bear market performance differences are insignificant. However, Belghitar, Clarke & Deshmukh (2017) find that during periods of crisis, SRI mutual funds in Europe underperform relatively to conventional funds, but simultaneously Leite & Cortez (2015) find evidence from French market that ESG or SRI related funds perform better during crisis times compared to conventional funds. This thesis presents a more profound literature review over performance related studies in chapter 5 and tries to provide further evidence in chapter 7.

4 Underlying theories

This thesis aims to measure whether socially responsible investing performance differs from conventional investing strategies during the crisis and thus is able to provide better hedge against the market downturns. There are multiple relevant underlying theories and models that need to be discussed in order to understand the thesis and its hypothesis fully, such as the efficiency of the markets, stakeholder theory and relevant models that are involved in measuring the potential differences in performance. This chapter discusses these theoretical models and theories and tries to explain the connection to socially responsible investing. For example, rational investors should follow Markowitz' modern portfolio theory as discussed above, which argues with the usage of responsible investing strategies as there are believed to be less diversification opportunities thus leading to not optimizing the risk and profit relationship.

4.1 Efficient market hypothesis

The famous efficient market hypothesis, commonly known as EMH, was first introduced by Fama in 1970. Underlying theory by Fama is that financial market prices fully reflect the available information, making it impossible to consistently achieve superior returns with public information or data. In this perspective, the efficiency of the market is considered to present how the financial asset prices reflect the information available and according to Fama's theory, assets are valued in their true value and cannot be undervalued or overvalued since all the information is available, making the markets efficient. This also indicates that opportunities for arbitrage do not exist as assets already reflect all of the information available and as said, securities are valued correctly in true value (Fama, 1970.) However, efficient market hypothesis is only a theoretical framework and does not represent the reality of the stock markets.

Fama (1970) introduces three different forms of efficiency. Firstly, the weak form where asset prices reflect all past trading information, thus meaning all historical data of the asset is valued in the current security price. Study suggests that prices follow so called

random walk, which implicates that past movements cannot predict the future of the asset price. For example, the certain asset rising for several straight days does not give information of the asset's future according to weak form of EMH. Secondly, the semi-strong form where all publicly available information is included into asset prices in the market more or less instantly, such as financial statements, historical price data and macroeconomic news. Semi weak form thus suggests that investors do not gain advantages studying financial information since according to theory they should not be able to beat the markets consistently and only new unanticipated information would influence security prices. An example for semi-weak form can be found from the company's announcements: if the company announces higher profits from expected, there should be no abnormal gains after the announcement as the price of stock should be adjusted immediately. Finally, strong form efficiency where stock prices reflect all the information, suggesting that market prices are absolutely the best estimate of value and investors are not able to gain abnormal profits. This form of EMH is more of a theory and not fully relatable to reality, as it also suggests that all insider information is also already reflected in the stock price, which is not known to be true.

As pointed out earlier, Fama's (1970) EMH states that market prices already reflect all available information, meaning investors cannot consistently earn abnormal returns by using public or private information. Therefore, relating to SRI, adding social or environmental factors should not give an advantage over traditional investing if the markets are efficient. Traditional studies support this hypothesis, as Hamilton, Jo & Statman (1993) find that SRI investments typically match the performance of conventional investments. Furthermore, ESG data in SRI can be viewed as just another source of information and Cao (2018) point out that SRI can reduce pricing efficiency since SR investors avoid buying underpriced ESG stocks, meanwhile hesitate to sell overpriced ESG stocks, which challenges the EMH since arbitrage does not fully correct this. Meanwhile, Beal, Goyen & Phillips (2005) remind that SRI includes behavioral aspects that are not aligned with efficient markets and as stated earlier, SR investors seek non-financial and non-rational utility from investing in sustainable instruments.

4.2 Stakeholder and shareholder theory

Shareholder and stakeholder theories are relevant for this topic as they demonstrate a company's responsibilities towards society and are therefore closely related to socially responsible investing e.g. through CSR. Shareholder theory was first introduced by Friedman (1970) and in essence it states that company has responsibilities for shareholders and is limited to that. Meanwhile shareholders have their own responsibilities in society. Stakeholder theory expands the model and considers that companies should take on interest towards all stakeholders, not just the shareholders (Freeman, 1984).

Both theories' objectives are to create value. According to Friedman's (1970) study, the company's main task is to increase profitability for its shareholders. Simultaneously, Freeman (1984) states that also in stakeholder theory, the objective is to create value for all stakeholders. In order to do so, companies first have to understand who their stakeholders are and what their values are and secondly recognize the relationships with all separate stakeholder groups (Freeman, 2014).

As Friedman argues, primary responsibility is to maximize shareholder wealth and engage in activities only when they are justified in a perspective of performance. Therefore, from this viewpoint, SRI may be seen as not necessary activity unless it has financial indicators of enhancing profitability or reducing risk. However, Jensen (2002) states that SRI can align with shareholder theory when sustainable practices improve efficiency, reputation or risk management and therefore support financial returns. Stakeholder theory has a more obvious relationship with SRI, as the perspective of companies' managing their relationships with stakeholders in a responsible way is completely in align with some SRI strategies presented earlier. As Clarkson (1995) shows, companies that effectively address the interests of stakeholders are expected to have more sustainable long-term performance.

4.3 Triple bottom line

Trible bottom line theory (TBL or 3BL) was introduced by Elkington (1998) and it is highly relevant to socially responsible investing, as the theory expands the traditional measures of companies' performance and success with not only financial profits, but also with social and environmental performance. Elkington's theory suggests that companies should not only generate financial value but also contribute in a positive way to society and environment, which is aligned with most of the SRI strategies. Slaper & Hall (2011) states that the above mentioned three factors of TBL directly correspond with ESG (environmental, social and governance) factors and confirm their alignment with modern SRI strategies.

Furthermore, Montiel (2008) studies CSR and CS (Corporate sustainability) and their connection to TBL and argue that CSR is rooted in the framework of TBL theory. He also points out the differences between CSR, CS, and TBL. For example, CSR typically has a focus on short-term issues or matters, such as stakeholder expectations and social issue management on short-term, aligning it with more to stakeholder theory. Meanwhile, CS focus is on long-term and can be associated with institutional theories.

Montiel (2008) also find that using TBL logic may offer a better hedge for the portfolio against market downturns, such as periods of crisis. The effect rises more from the company's behavior, as using TBL logic at company level, corporates tend to balance short-term stakeholder engagement and long-term ecological and financial sustainability, allowing greater resilience and risk mitigation. Again, this type of approach is very much aligned with CSR and SRI.

4.4 Models

4.4.1 Sharpe ratio

The Sharpe ratio, also referred to as Sharpe index or the reward-to-variability ratio, was introduced in 1966 by economist William F. Sharpe and is still a widely known and used model among investors. It is a measure of risk-adjusted performance, as it evaluates an investment's excess return relative to its volatility. Specifically, the Sharpe ratio calculates excess return as the return achieved above the risk-free rate, typically measured against the return of Treasury bills (Israelsen, 2004.)

The Sharpe ratio reflects the amount of additional return an investor receives per unit of risk, with risk measured by volatility. A higher Sharpe ratio signals stronger portfolio performance, while a lower or negative ratio suggests weaker performance (Nikkinen et. al., 2002.) The formula for Sharpe ratio presented by William F. Sharpe (1966) is shown below in equation (2).

$$S_p = \frac{R_p - R_f}{\sigma} \tag{2}$$

Where:

R_p = Return of the portfolio

R_f = Risk free rate

σ = Standard deviation of the portfolio

4.4.2 Treynor ratio

The Treynor ratio, also called the Treynor index, was developed in 1965 by Jack L. Treynor as a tool to evaluate the performance and risk of a portfolio (Treynor, 1965). Unlike the Sharpe ratio, which is presented below and measures risk using the portfolio's standard deviation, the Treynor ratio relies on the portfolio's beta to capture systematic risk (Nikkinen, Rothovius, Sahlström & Sinivuori, 2002).

Portfolio performance measured by the Treynor ratio is closely related to Sharpe ratio, with the main distinction being the denominator used in the formula. As a result, the outcomes of these two widely applied performance measures are often quite similar. Similarly to Sharpe ratio, also a higher Treynor ratio value indicates stronger portfolio performance, while a lower value reflects weaker performance (Nikkinen et al., 2002.) Formula for Treynor ratio (1965) is presented below in equation (3).

$$T_p = \frac{R_p - R_f}{\beta} \tag{3}$$

Where:

R_p = Return of the portfolio

R_f = Risk free rate

β = Beta value of the portfolio

4.4.3 Jensen's alpha

In 1968, Michael C. Jensen introduced an alternative method for evaluating portfolio performance, as he disagreed with some of the assumptions underlying the Sharpe and Treynor models, such as investors being universally risk-averse, having identical investment horizons, and operating in markets without taxes or transaction costs (Jensen, 1968.) Jensen's alpha measures a portfolio's alpha, representing the difference between its actual return and the expected benchmark return, which is typically derived from the CAPM (Capital Asset Pricing Model) but can also be based on the APT (Arbitrage Pricing Theory) (Murthi, Choi & Desai, 1997).

According to Murthi et al. (1997), Jensen's alpha is the most widely used method for assessing portfolio performance. Nikkinen et al. (2002) note that alpha values can be positive, negative, or zero. A positive alpha suggests that portfolio is undervalued relative to its risk, while an alpha of zero indicates that the portfolio is fairly priced given the level of risk it carries. Jensen' alpha is presented below in equation (4).

$$\alpha = R_p - [R_f + \beta_p(R_m - R_f)] \quad (4)$$

Where:

R_p = Return of the portfolio

R_f = Risk free rate

β_p = Beta value of the portfolio

R_m = Mean return of the market portfolio

4.4.4 CAPM

Capital Asset Pricing Model (CAPM), developed by Sharpe (1964) and Litner (1965) and other contributors, is still one of the most commonly used tools for estimating the cost of capital for companies and assessing the portfolios' performance. Ultimately, CAPM offers an effective prediction for measuring the risk and relationship between risk and expected returns (Fama & French, 2004.) CAPM asserts that investors are rewarded only for non-diversifiable risk, measured by beta, and that a well-diversified portfolio eliminates firm-specific risk (Elbannan, 2009).

CAPM follows Markowitz's portfolio theory, which assumes that investors are risk averse when choosing their portfolio and their only interest is the mean and variance of investment return. Theory suggests that investors aim to build a portfolio that either reduces the variance of returns for a chosen level of expected return, or increase return for a given level of risk (Fama & French, 2004; Elbannan, 2009.) Therefore, according to CAPM, so called allocation lines should be similar if every investor optimizes portfolio and shares the same investment universe with the same risk-free rate. Put simply, this would indicate that investors will invest in a similar portfolio, and furthermore the market portfolio would also be similar (Bodie, Kane & Marcus, 2014).

The CAPM assumes that the risk premium of individual security is based on its contribution to the overall risk of the market portfolio. For assumption to hold, the price of risk must be consistent across all assets. If this were not the case, investors would

move their capital toward assets by offering a higher reward-to-risk ratio. Therefore, the market price of risk and the risk price of individual assets must align (Bodie et al, 2014.)

Related to CAPM, the efficient frontier represents the optimal portfolios that maximize expected return for a given level of risk or vice versa minimize risk for a given level of return. Capital market line (CML) extends the concept by introducing risk-free assets, and therefore when investors are able to combine risk-free assets with risky assets, they find CML which is above the efficient frontier. It shows the highest possible expected return for each level of combined or total risk which is measured by standard deviation. To conclude, CAPM implies that all investors would hold some combination of the risk-free asset and the market portfolio, which can be found from the figure provided below (Bodie et al., 2014; Markowitz, 1952; Sharpe, 1964.)

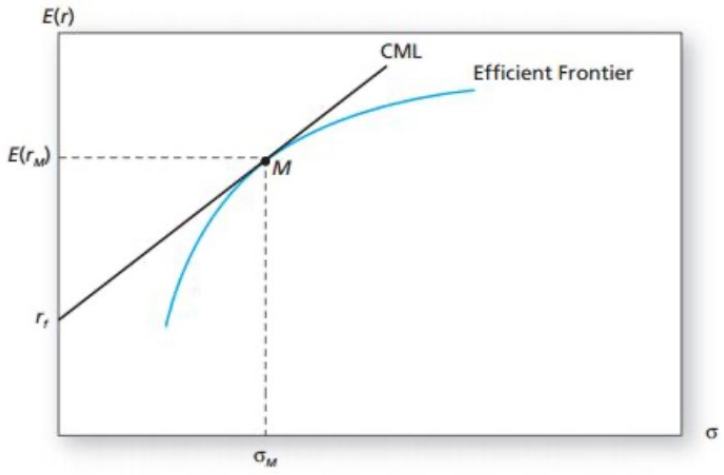

Figure 5. Efficient frontier (Bodie et al., 2014)

Formula for CAPM is presented below in equation (5).

$$E(R_s) = r_f + \beta_s[E(R_M) - r_f] \quad (5)$$

Where: $E(R_s)$ = Expected return for one stock (CAPM)

r_f = Risk-free rate

β_s = Beta of the asset

$E(R_M)$ = Expected return on the market portfolio

4.4.5 Fama & French 3-factor model

The Fama-French 3-factor model is an extension of the Capital Asset Pricing Model and aims to explain abnormal returns and assess investment performance (Fama & French, 1996). The first factor in this model is the excess return of the market portfolio, which corresponds to the CAPM market factor. The second factor, known as the size factor (SMB), captures the performance differences between small and large companies. The third factor, the value factor (HML), reflects the differences in return between companies with high book-to-market ratios and those with low book-to-market ratios (Petkova, 2006). These three factors, market, size, and value, together help better understand differences in stock returns. The formula for 3-factor model is presented below in equation (6).

$$R_i = R_f + \beta_i \left(R_m - R_f\right) + SMB + HML + \varepsilon \quad (6)$$

Where:

R_i = Return on asset i

R_f = Risk free rate of return

β_i = Beta of the portfolio

R_m = Return of market index

SMB = Respectively size factor

HML = Respectively value factor

ε = Error term

5 Literature review

Research and evidence of the performance of SRI strategies has also become trendier as the strategies have grown into a popular topic in the field of finance. However, there is still no mutual understanding or clear evidence whether the SRI is able to consistently outperform or underperform the conventional strategies and what implications there are during significant market events, such as downturns. Some studies, such as Hornuf & Yuksel (2024) even find that on average, there is no difference between SRI portfolio and market portfolio, suggesting that using sustainable factors in investing decision-making does not affect performance and therefore does not matter. In this literature review, study tries to conclude findings from multiple authors and discuss whether SRI outperforms, underperform, or have similar performance with conventional portfolios and tries to include if market events play a role in the performance of SRI.

Socially responsible investors care not only about the financial performance of their portfolio but also about non-financial aspects of the companies they invest in, such as environmental impact, corporate governance, and social practices. This multi-dimensional nature of SRI has led critics to question whether there is a trade-off between financial and non-financial goals, which could affect portfolio performance (Galema, Plantinga & Scholtens, 2008.) According to modern portfolio theory, SRI portfolios simply underperform compared to conventional portfolios just because in responsible investing, investors exclude certain industries through screening, which results in smaller investment universe thus limiting the diversification (Le Maux & Le Saout, 2004). Renneboog, Ter Horst & Zhang (2008) recognizes two possible explanations for such underperformance. First, the gap in performance between SRI and conventional portfolios may reflect differences in risk, as models like CAPM or multifactor model do not account for an ethical factor, meaning the results may simply mirror this missing element. Second, companies with strong ethical standards may be overpriced in the market, since investors may avoid unethical firms or demand for ethical firms drives the prices above fundamental values. In both scenarios, higher valuations could contribute to weaker performance of SRI portfolio.

Several studies provide evidence supporting the underperformance of SRI funds. Frost, Jones, van der Laan & Loftus (2008) report that, over 30-year period, SRI portfolios significantly underperform major market benchmarks in both raw and risk-adjusted terms, using single-factor and multi-factor models. Similarly, Diltz & Goldreyer (1999) show that conventional portfolios generally achieve higher alphas than SRI portfolios measured with the Treynor ratio, Jensen's alpha and Sharpe ratio, indicating weaker performance for SRI portfolios. However, their findings also suggest that the performance gap is not consistent. In several important cases, SRI funds perform on par with, or even better than conventional funds, suggesting that underperformance is not universal.

Other studies also find that circumstances and geological matters may influence performance hypotheses. For example, Nofsinger et al. (2014) show that the connection between SRI and financial performance varies across market conditions. Their study finds that SRI tends to outperform the market during crises but lags behind in stable, non-crisis periods. This suggests that SRI offers a form of downside protection, making it a potential safe haven for investors in times of market downturns. Renneboog et al. (2008) report that SRI portfolios underperform conventional ones in Continental Europe and Asia-Pacific region. In contrast, Bauer, Koedijk, & Otten (2005) find no significant evidence of underperformance among SRI funds in the U.S. as well as in Germany and Switzerland, perform in line with their benchmarks which suggest that responsible investors do not necessarily have to accept lower returns.

Some studies challenge earlier findings of SRI underperformance. Lean et al. (2015) show that based on multi-factor model results, SRI funds in Europe and North America outperforms their benchmarks, suggesting that investors can meet ESG goals without sacrificing financial returns. Similarly, Le Maux & Le Saout (2004) report that in approximately 70% of cases, responsible portfolios achieve better performance than their peer benchmarks when evaluated using the Sharpe and Treynor ratios. Eccles, Ionnou, & Serafeim (2014) find a positive relationship with SRI and performance, as they

state that sustainable culture in corporates affects positively on performance in the long term. Also Syed (2017) finds a positive relationship, stating that the relationship between SRI and performance is positive but insignificant in both scenarios; market downturns and in stable market conditions indicating the possibility that SRI assets may have better hedging potential during market crashes.

Henke (2016) study examined SRI bond funds and find that SRI outperforms conventional ones during crisis periods, such as in times of dotcom bubble and 2008 financial crisis. Study also extends that there is no significant difference in performance during stable conditions, suggesting that SRI backed investments may offer downside protection during market turmoil. Also, Heldmann, Bruckner, & Dang (2025) find evidence that across global markets, sustainable MSCI indices cumulate higher returns and Sharpe and Treynor ratios in medium and long term than conventional benchmarks. They also argue that SRI indices have better valuation metrics and sustainable indices consistently outperform traditional indices. Arraino (2018) adds that ESG investments in Europe show greater resilience against market crashes compared to traditional investment strategies and may offer risk mitigation.

Multiple, if not most studies, shows mixed results or indifference in the performance between SRI and conventional portfolios. Early study by Sauer (1997) compares social indexes with S&P 500 with risk-adjusted measures and finds that screening for social responsibility does not necessarily harm the performance of SR investments, which is in line with later findings of Bauer, Koedijk & Otten (2005). Halbritter & Dorfleitner (2015) states simply that performance results are mixed since data and methodology have a significant effect on results. Therefore, they do not conclude that there are consistent relationships between ESG ratings and risk-adjusted returns and using SRI does not guarantee either outperformance or underperformance. Another early study by Hamilton, Jo & Statham (1993) measures the performance differences with CAPM measures and finds weak evidence of SRI underpeformance, but findings are not statistically significant. Also, Hornuf et al. (2024) share similar outcomes in their study,

as they state that SRI performance is dependent on context and therefore no universal penalty or advantage exists in SRI. They acknowledge that performance depends on period, region and methodology, thus SRI portfolio neither systematically outperform no underperform conventional ones. Revelli & Viviani (2015) use meta-analysis to study the performance relationships and differences and find that on average SRI portfolio do not significantly outperform or underperform conventional ones, therefore there is no strong evidence of a trade-off between responsibility and performance.

Furthermore, Mollet & Ziegler (2014) examine the performance of SRI in both U.S. and European stock markets using Carhart factor model and findings show that abnormal returns from SRI are insignificant, suggesting that SR investing neither imposes a financial cost nor provides a financial advantage. Also, in line with the above-mentioned studies, Auer et al. (2016) report that the relationship varies across regions. While relationship is absent in the U.S. and Asia, SRI portfolios in Europe tend to underperform the broader market.

To conclude, earlier studies show indifference in results of the relationship between SRI and performance, both in stable market conditions and during market downturns. Also, measuring methods, data, and regional matters may cause indifferent results upon the topic.

6 Data and methodology

The following chapters introduce the data and methodology used in the thesis. The data section explains the data and indices used to conclude evidence for the study and time horizon of the data. The methodology part introduces metrics and models to conclude evidence with mentioned data. Also, descriptive statistics are introduced at the end of the data section.

6.1 Data

This study investigates the performance of socially responsible investment portfolios compared to the conventional market portfolio during the 2008 financial crisis. The analysis uses daily return and price data to ensure consistency with prior literature. All index data is from Datastream, except Fama & French model factors are from Kenneth R. French data library.

The SRI universe is represented by MSCI KLD 400 Social Index and MSCI USA SRI Index, which are commonly recognized benchmarks for responsible investments in the U.S market. MSCI KLD 400 Social Index includes large, mid, and small cap companies and is a capital weighted index of 400 U.S. securities that are exposed to firms with high ESG ratings and not exposed to negative screened “bad companies”. It is designed for investors who seek firms with strong responsibility or sustainability profiles while avoiding firms that do not meet sustainability values via negative screens. It is one of the first indexes following SRI. MSCI USA SRI Index includes mid and large cap stocks from U.S. market and otherwise share similar characteristic with MSCI KLD 400 Social Index. MCSI USA SRI Index uses best-in-class selection and exclusion criteria with investment universe, thus representing SRI and ESG companies (MSCI, 2025.) This thesis uses indexes daily total returns rather than daily prices, as total returns represent performance abilities more fairly.

The S&P 500 index serves as the benchmark, as it reflects the overall performance of the U.S equity market and is the most used standard in performance evaluation. The benchmark index consists of 500 top companies from U.S equity markets and approximately covers 80% of available market capitalization (SP Global, 2025). For risk-free rates, this thesis uses U.S. Treasury bills.

The data frequency is daily, and the data starts from 15.9.2008 which is considered to be the starting point of the crisis as Lehman Brothers went bankrupt. The data ends on 30.6.2009, which is the ending point of the crisis according to NBER.

	MSCI KLD	MSCI USA SRI	S&P 500
Mean	-0,00106	-0,00115	-0,00116
Median	0,00000	-0,00082	0,00000
Standard Deviation	0,03034	0,02960	0,03067
Kurtosis	1,32492	1,08410	1,62160
Skewness	0,01835	0,02847	-0,01785
Minimum	-0,09346	-0,09298	-0,09460
Maximum	0,10379	0,09804	0,10958
Observations	206	206	206

Table 2. Descriptive statistics

Above are descriptive statistics from three indices introduced from 15.9.2008 to 30.6.2009 calculated from daily log returns. Normal distribution kurtosis in these calculations is 0, not 3 as suggested. All indices share quite similar statistics, but SRI indices show slightly better resilience against the crash. MSCI indices lost slightly less per day than S&P 500, suggesting small outperformance in the crisis period. They also experience a bit lower volatility, indicating slightly better risk profile. Kurtosis is positive for all indices, which is expected in extreme market events and skewness shows that SRI is able to offer better downside protection against the crash. However, while minimum and maximum returns are quite similar, S&P 500 is able to rebound the strongest on the best days.

6.2 Methodology

The objective of the study is to examine performance differences between MSCI indexes and S&P 500 market index during the time of crisis and methodology follows earlier academic literature, such as Nofsinger & Varma (2014) and Frost et al. (2008). Therefore, performance indicators such as Sharpe ratio, Treynor ratio and Jensen's alpha are used to evaluate performance. To assess abnormal returns, thesis focuses on regression models such as, Capital Asset Pricing Model and Fama-French Three-Factor Model, which are also known methodologies from earlier research.

The above-mentioned methods and measures are introduced earlier in this study and empirical results follow these equations. The timeframe of the study is 15.9.2008-30.6.2009 and indexes' daily total returns are modified to log changes.

Robustness check is noted, as this study includes two different SRI related indices and therefore comparison and mutuality of them are considered in this thesis. This thesis focuses only on timeframe during the crisis and does not consider data from pre or post crisis, therefore there is no comparison to non-crisis period.

7 Results

The following chapter introduces results from performance measures introduced in the methodology part and briefly analyzes the results from tables presented. First part will show tables and explanations from performance measures (Sharpe, Treynor & Jensen) and the following part will analyze the regression models (CAPM & Fama-French). Conclusions and recommendations for further studies are considered in the last chapter of this study.

7.1 Performance measures

	MSCI KLD	MSCI USA SRI	S&P 500
Daily	-0,122	-0,122	-0,122
Annualized	-1,745	-1,746	-1,747

Table 3. Daily and annualized Sharpe ratios

Above table presents Sharpe ratios from the crisis period for three indices and they are all negative and very similar to each other, partly since data period is quite short and all indexes can be also viewed as quite similar in risk vises. The risk-free rate for the Sharpe ratio is calculated with daily returns of U.S Treasury bills with 3-month maturity. Annualized Sharpe values are populated through the sample period.

The Sharpe ratio measures the risk-adjusted returns with excessive returns on portfolio against risk-free rates. It presents the relationship between risk and returns, and higher Sharpe ratio indicates better return per unit of risk. All three indexes show negative ratios and are almost identical across each other, which can be interpreted as poor performance for each index. Calculations show that there are no meaningful differences on a risk-adjusted basis according to Sharpe ratio and no index outperforms or underperforms compared to other ones.

	MSCI KLD	MSCI USA SRI	S&P 500
Beta	0,985	0,960	1,000
Treynor	-0,101	-0,104	-0,099

Table 4. Betas and Treynor ratios

The above table presents the betas and Treynor ratios for three selected indexes for the crisis period. Beta is calculated against the S&P 500 index and indicates the sensitivity of the portfolio to market movements, hence the beta for S&P 500 is 1,000 which is an indicator that it moves in line with the market. Beta value indicates the volatility of the portfolio against the market and Treynor can be interpreted quite similarly with Sharpe ratio, but Treynor measures the excess returns against per unit of systematic risk which is presented as beta. A higher Treynor ratio indicates better compensation for systematic risk, also referred to as market risk.

The results show that both socially responsible indices, MSCI KLD and MSCI USA SRI, have slightly lower systematic risk compared to S&P 500, with beta values of 0,985 and 0,960. This indicates that SRI portfolios are slightly less sensitive to market movements and experience smaller fluctuations than the overall market. MSCI USA SRI has the lowest beta, meaning it is the least volatile index against the market and experiences the lowest systematic risk within the sample.

During the sample period, all three indices have negative Treynor ratios. SRI portfolios MSCI KLD and MCSI USA SRI have slightly higher negative values compared to the market portfolio S&P 500, which indicates that socially responsible indices delivered slightly lower returns for each unit of market risk than S&P 500. On a risk-adjusted basis, SRI indices underperform the market in the sample period, but at the same time are slightly less risky than the S&P 500. The results show that investors seeking SR investments may achieve lower volatility but may not expect higher risk-adjusted returns in exchange for it.

7.2 Regression models

	MSCI KLD	MSCI USA SRI
Alpha	0,0001091	0,0000453
Standar error	0,0002059	0,0003015
t - Stat	0,5299646	0,1503174
P - value	0,5967128	0,8806627

Table 5. Summary of regression table and Jensen's Alpha

The above table represents the summary of regression of SRI funds MSCI KLD and MSCI USA SRI during the sample period with market excess returns S&P 500. Jensen's alpha (in table "Alpha") indicates the portfolio's excess return above expected based on its beta or market risk. Positive alphas indicate that portfolios earn more than expected for its level of market risk and vice versa negative alpha suggest that portfolio is underperforming or has poor risk-adjusted returns.

Both alphas for MSCI KLD and MSCI USA SRI are positive, but very close to zero, indicating that indexes returns are almost exactly what are expected based on their beta, or market risk. This finding would suggest that there are no significant performance differences between sampled portfolios and S&P 500 market index during the time of crisis.

However, as t-statistics and P-values show, the results are not statistically significant, which indicates that neither the portfolio delivers abnormal returns nor performance is consistent with what is expected based on their exposure to the market. This finding also concludes that although alphas are small, it is more likely that observed alphas are due to a random chance rather than fundamentals from portfolios. Furthermore, relatively high standard error highlights that positive alphas are more likely due to random variation.

	α	β	R^2
MSCI KLD	0,00011	1,00019***	0,99998
	(0,597)	(0,000)	
MSCI USA SRI	0,00005	1,00072***	0,99997
	(0,881)	(0,000)	

Table 6. Extended regression (CAPM)
P-values are presented in parenthesis under the values. *** denotes that results are statistically significant at 1% level.

Alphas of the sample are presented already in table 5, but above table extends regression model with Capital Asset Pricing Model. As stated, the alphas of the two portfolios are statistically not significant and suggest that SRI indices move almost perfectly in line with S&P 500 and market index movements explain most of the SRI indices movements.

However, the betas of both MSCI KLD 400 Social and MSCI USA SRI portfolios are statistically significant and very close to one as they are 1,00019 and 1,00072, which supports the earlier finding that SR indices have equal exposure to market risk. Slightly positive beta indicates that SRI investments experience minimally more movements than S&P 500 index in general. With presented alpha and beta it can be concluded that evidence does not show any underperformance or overperformance of SRI against the market during the period of crisis. In addition, neither index generates abnormal returns relative to the market.

The explanatory factors R^2 for both MSCI KLD and MSCI USA SRI are extremely high with values of 0,99998 and 0,99997. High explanatory factors confirm that the performance of both indexes is almost entirely explained by the market index S&P 500.

	α	$r_{mt} - r_f$	SMB	HML	R^2
MSCI KLD	-0,10572*	0,01313	0,03336	-0,07120*	0,02150
	(0,073)	(0,576)	(0,519)	(0,080)	
MSCI USA SRI	-0,10585*	0,01271	0,03316	-0,07089*	0,02141
	(0,073)	(0,589)	(0,521)	(0,081)	

Table 7. Fama & French 3-factor model

Table presents results of Fama&French 3-factor regression model against S&P 500 benchmark. P-values are presented in parenthesis under the values. ***, ** and * denote the significance levels 1%, 5% and 10%.

Table 7 introduce the Fama & French 3-factor regression results and in line with earlier, results are for both MSCI KLD 400 and MSCI USA SRI indices for the 2008 crisis period. The benchmark index remains the same, being S&P 500 from the same period.

With Fama & French 3 factor model, both indices MSCI KLD 400 Social and MSCI USA SRI have negative alphas -0,10572 and -0,1585 and are statistically significant at 10% level. This indicates that there is weak evidence of SRI underperformance after controlling for the Fama-French factors during the crisis period.

Fama & French market factor coefficients are very small and close to zero, MSCI KLD 400 Social being 0,01313 and MSCI USA SRI 0,01271. This can pe interpreted as that market risk premium is not driving the returns when controlling for other factors. However, P-values for market factor are high and thus this finding is not statistically significant. Also, size factor (SMB) is not statistically significant as P-values rise above 0,1 for both indexes. Positive values for size factor, 0,03336 for MSCI KLD and 0,03316 for MSCI USA SRI, indicate that there is no tilt towards small-cap stocks and SRI does not benefit from size effects, but as shown, results are not statistically significant.

Value factors for both MSCI KLD and MSCI USA SRI are negative, being -0,07120 and -0,07089 with under 0,1 P-values indicating statistical significancy at 10% level. Negative value factors show that SRI indices tilt more towards growth stocks rather than value stocks during crisis, meaning SRI portfolios behavior during crisis is more similar to

growth portfolios. This could be an indicator of weaker performance during the downturn, since growth portfolios are considered to be more affected by market events.

However, as shown in the table, the explanatory factor is extremely low for both MSCI KLD and MSCI USA SRI. Approximately 0,021 factor indicates that all three factors (market, size and value) explain very little to none of the variation in sampled portfolios returns during the selected time period. This suggest that almost all of the performance of the SRI portfolios during the crisis is not captured by Fama & French 3-factor model, thus suggesting there are other explanatory factors involved.

To conclude, all three studied indices, MSCI KLD 400 Social, MSCI USA SRI and S&P 500 as a benchmark, show negative and nearly identical Sharpe ratios during the financial crisis of 2008, which indicate weak performance across all indices. Results from Sharpe ratio show that there are no meaningful differences in risk-adjusted returns, and same trend continues with the Treynor ratios, as all of the three indices face negative Treynor ratios during the crisis. For SRI indices, ratios are slightly lower, indicating SRI portfolios to be marginally less volatile against the markets.

Neither regression models CAPM and Fama & French 3-factor model show significant evidence to support overperformance or underperformance hypothesis, as many of the findings are not statistically significant. Both regression models rather suggest that MSCI KLD 400 Social and MSCI USA SRI indexes more or less follows the performance and trends along with market benchmark S&P 500.

8 Conclusions

This thesis examines the performance of socially responsible investing (SRI) during market downturns, using evidence from the 2008 financial crisis. First this thesis provides a comprehensive overview of the strategies and history of SRI and introduces commonly used performance measures and methods around portfolio performance. Secondly, this thesis gives a vast review of past literature around the topic and tries to contribute to the discussion by analyzing two SRI indexes' performance during the 2008 crisis against the market portfolio S&P 500. This last chapter of the study summarizes the findings and concludes whether the hypothesis introduced are true and also refers to previous studies.

Two SRI indices this thesis focuses are MSCI KLD 400 Social and MSCI USA SRI, the objective being to understand whether there are better hedging opportunities during the crisis times compared to S&P 500 using Sharpe and Treynor ratios and CAPM and Fama & French 3-factor regression models. The results indicate that SRI funds consistently perform very similarly to its benchmark S&P 500, showing slightly lower market risk but no statistically significant abnormal returns. In terms of risk-adjusted returns, all three indices show negative Sharpe and Treynor ratios during the crisis which indicates poor overall performance across the markets.

The CAPM regression confirms that SRI indices move almost identical with the market portfolio, having betas close to one and alphas statistically insignificant. This concludes that neither MSCI KLD nor MSCI USA SRI provides abnormal returns or a better hedge during the market downturn comparing to S&P 500. Furthermore, Fama & French three factor model aligns with poor performance findings and highlights them with also negative alphas at marginally significant 10% level suggesting slight underperformance. Also, SRI indices tend to tilt toward growth stocks which is reflected in negative and significant loadings on the value factor (HML) which also contributes to the weaker performance during the crisis. However, there are low explanatory factors in three factor

model, indicating that traditional risk factors do not fully explain the performance of SRI indices and suggest that there are other drivers for poor performance.

These findings are widely in line with previous literature and findings, which often provide evidence for SRI does not significantly outperform traditional benchmarks in stable market times or during market downturns such as Le Maux & Le Saout, (2004) & Renneboog, Ter Horst & Zhang (2008). Also, early study by Hamilton, Jo & Statman (1993) find that there are no differences between SR investing and traditional investing, which is in line with the findings of this thesis.

In relation to introduced hypotheses, the evidence from the study does not support H1, which suggests that SRI portfolios provide better hedge during the 2008 financial crisis than conventional portfolios with overperforming them. Instead, the results show that SRI indices behave almost identically to the S&P 500 index and does not offer advantages regarding hedging or performing. Similarly, H2 hypothesis is not supported, as it proposes that companies incorporating CSR and ESG would outperform their benchmark. SRI indices in the study do not provide positive significant alphas and show weak evidence to support hypothesis. Thus, both hypotheses are rejected.

Data and indices used in study are quite narrow and limited, which is one critical reason for not conclusive evidence leaving room for several ideas for further research. Thus, further studies and research should consider a wider dataset and compare performance differences also in stable market environment. Also, SRI is still evolving and gaining a permanent and strong role in the field of finance, resulting in new and modern SRI instruments which could alternate the results of similar studies. The 2008 financial crisis was one of the largest turmoil the financial world has faced, but since then there are other significant market events, such as covid-19 crisis, which would give another good sample period for comparing differences between SRI and the market performance. Although the history of SRI reaches back for decades and research is becoming more popular around it, there is still inconclusive evidence of important matters around SRI

and more research is needed in order to gain a better understanding of the fundamentals and effects of responsible investing.

References

Agrawal, Anirudh, and Kai Hockerts. "Impact investing: Review and research agenda." *Journal of Small Business & Entrepreneurship* 33.2 (2021): 153-181.

Arraiano, I. G. (2018). The Impact of Socially Responsible Investing in European Markets: Evidence of the Global Financial Crisis. *European Journal of Sustainable Development*, *7*(4), 95-95.

Auer, B. R. & Schuhmacher, F. (2016). Do socially (ir)responsible investments pay? New evidence from international ESG data. *The Quarterly review of economics and finance, 59*, pp. 51-62. doi:10.1016/j.qref.2015.07.002

Avetisyan, E., & Hockerts, K. (2017). The consolidation of the ESG rating industry as an enactment of institutional retrogression. *Business Strategy and the Environment*, *26*(3), 316-330.

Barber, Brad M., Adair Morse, and Ayako Yasuda. "Impact investing." *Journal of Financial Economics* 139.1 (2021): 162-185.

Barnett, M. L. & Salomon, R. M. (2006). Beyond dichotomy: The curvilinear relationship between social responsibility and financial performance. *Strategic Management Journal, 27*(11), pp. 1101-1122. doi:10.1002/smj.557

Bauer, R., & Hann, D. (2010). *Corporate environmental management and credit risk*. SSRN. https://doi.org/10.2139/ssrn.1660470

Bauer, R., & Smeets, P. (2015). Social identification and investment decisions. Journal of Economic Behavior & Organizations, 117, 121–134

Bauer, R., Koedijk, K. & Otten, R. (2005). International evidence on ethical mutual fund performance and investment style. *Journal of banking & finance, 29*(7), pp. 1751-1767. doi:10.1016/j.jbankfin.2004.06.035

Beal, D., Goyen, M., & Phillips, P. J. (2005). Why do we invest ethically?. *The journal of investing*, 14(3), 66-77.

Becchetti, L., Ciciretti, R., Dalò, A., & Herzel, S. (2015). Socially responsible and conventional investment funds: performance comparison and the global financial crisis. *Applied Economics*, *47*(25), 2541-2562.

Belghitar, Y., Clark, E., & Deshmukh, N. (2017). Importance of the fund management company in the performance of socially responsible mutual funds. *Journal of Financial Research*, *40*(3), 349-367.

Bello, Z. Y. (2005). Socially responsible investing and portfolio diversification. *Journal of Financial Research*, *28*(1), 41-57.

Bodie, Z., A. Kane. & A. J. Marcus (2014). *Investments*, 10th Global Ed. 1014 p. *McGraw-Hill Education*. ISBN-13 9780077161149

Bollen, N. (2007). Mutual fund attributes and investor behaviour. *Journal of Financial and Quantitative Analysis*, 42, 683–708

Busch, T., van Hoorn, V., Stapelfeldt, M. & Pruessner, E. (2022) https://www.eurosif.org/wp-content/uploads/2022/07/FINAL-White-Paper-Eurosif-Classification.pdf

Cao, J. (2018). ESG preference and market efficiency: Evidence from mispricing and institutional trading. *SSRN available.*

Clarkson, M. E. (1995). A stakeholder framework for analyzing and evaluating corporate social performance. *Academy of management review*, *20*(1), 92-117.

Cowton, C., & Sandberg, J. (2012). *Socially Responsible Investment*. https://doi.org/10.1016/B978-0-12-373932-2.00086-7

Davis, S. J., & Von Wachter, T. M. (2011). *Recessions and the cost of job loss* (No. w17638). National Bureau of Economic Research.

Díaz, A., Esparcia, C., & López, R. (2022). The diversifying role of socially responsible investments during the COVID-19 crisis: A risk management and portfolio performance analysis. *Economic Analysis and Policy*, *75*, 39-60.

Diltz, J. D. (1995). Does Social Screening Affect Portfolio Performance? *The Journal of Investing, 4*(1), pp. 64-69. doi:10.3905/joi.4.1.64

Eccles, R. G., I. Ionnou & G. Serafeim. (2014). The impact of corporate sustainability on organizational processes and performance. *Management Science: 60:11, 2835-2857.*

Elbannan, M. A. (2015). The capital asset pricing model: an overview of the theory. *International Journal of Economics and Finance*, *7*(1), 216-228.

Elkington, J. (1998). Partnerships from cannibals with forks: The triple bottom line of 21st-century business. *Environmental quality management, 8*(1), 37-51. https://doi.org/10.1002/tqem.3310080106

Erkens, D. H., Hung, M., & Matos, P. (2012). Corporate governance in the 2007–2008 financial crisis: Evidence from financial institutions worldwide. *Journal of corporate finance*, *18*(2), 389-411.

Eurosif (2018). European SRI study 2018. Available on world wide web: <URL: http://www.eurosif.org/wp-content/uploads/2018/11/European-SRI-2018-Study.pdf>

Fama, E. F. (1972). Components of investment performance. *The Journal of finance*, *27*(3), 551-567.

Fama, E. F. (1970). Efficient capital markets: A review of theory and empirical work. *The journal of Finance*, *25*(2), 383-417.

Fama, E. F. & French, K. R. (1996). Multifactor Explanations of Asset Pricing Anomalies. *Journal of Finance, 51*(1), pp. 55-84. doi:10.1111/j.1540-6261.1996.tb05202.x

Fama, E. F., & French, K. R. (2004). The capital asset pricing model: Theory and evidence. *Journal of economic perspectives*, *18*(3), 25-46.

Financial Crisis Inquiry Commission. (2011). *The financial crisis inquiry report: Final report of the National Commission on the causes of the financial and economic crisis in the United States*. U.S. Government Printing Office.

Freeman, R. E. (1984). *Strategic management: A stakeholder approach*

Freeman, R. E. (2004). The stakeholder approach revisited. *Zeitschrift Für Wirtschafts- Und Unternehmensethik*

Friede, G. (2019). Why don't we see more action? A metasynthesis of the investor impediments to integrate environmental, social, and governance factors. *Business Strategy and the Environment*, *28*(6), 1260-1282.

Friede, G., Busch, T., & Bassen, A. (2015). ESG and financial performance: Aggregated evidence from more than 2000 empirical studies. *Journal of sustainable finance & investment, 5*(4), 210-233. https://doi.org/10.1080/20430795.2015.1118917

Friedman, M (1970). A Friedman doctrine-- The social responsibility of business is to increase its profits, *New York Times.*

Galema, R., Plantinga, A. & Scholtens, B. (2008). The stocks at stake: Return and risk in socially responsible investment. *Journal of banking & finance, 32*(12), pp. 2646-2654. doi:10.1016/j.jbankfin.2008.06.002

Giese, G., Lee, L. E., Melas, D., Nagy, Z., & Nishikawa, L. (2019). Foundations of ESG investing: How ESG affects equity valuation, risk, and performance. *The Journal of Portfolio Management*, *45*(5), 69-83.

Girard, E., Rahman, H. & Stone, B. (2007). Socially Responsible Investments: Goody-Two-Shoes or Bad to the Bone? *Journal of Investing, 16*(1), pp. 96-110,7. doi:10.3905/joi.2007.681827

Global Sustainable Investment Review finds US$30 trillion invested in sustainable assets (gsi-alliance.org)

Goldreyer, E. F. & Diltz, J. D. (1999). The performance of socially responsible mutual funds: Incorporating sociopolitical information in portfolio selection. *Managerial Fi-nance, 25*(1), pp. 23-36. doi:10.1108/03074359910765830

GRI - Home (globalreporting.org)

Hamilton, S., Jo, H., & Statman, M. (1993). Doing well while doing good? *Journal of Investing*, 2(2), 7–17.

Halbritter, G., & Dorfleitner, G. (2015). The limits of ESG: Where are they? A critical review of ESG investing. *Review of Financial Economics, 26*(1), 1–9. https://doi.org/10.1016/j.rfe.2015.03.001

Heldmann, J., Brückner, T., & Dang, H. D. (2025). Financial returns of going green: evidence from MSCI indices: J. Heldmann et al. *Journal of Asset Management*, 1-20.

Herrera-Cano, C., & Gonzalez-Perez, M. A. (2016). Global financial crisis and the emergence and maturing of socially responsible investments. In *Lessons from the great recession: At the crossroads of sustainability and recovery* (pp. 189-202). Emerald Group Publishing Limited.

Humphrey, J. E., & Lee, D. D. (2011-09-01). Australian Socially Responsible Funds: Performance, Risk and Screening Intensity. *Journal of business ethics, 102*(4), 519-535. https://doi.org/10.1007/s10551-011-0836-7

Henke, H. (2016-06-01). The effect of social screening on bond mutual fund performance. *Journal of banking & finance, 67*, 69-84. https://doi.org/10.1016/j.jbankfin.2016.01.010

Hornuf, L., & Yüksel, G. (2024). The performance of socially responsible investments: A meta-analysis. *European Financial Management*, *30*(2), 1012-1061.

Höchstädter, A. K., & Scheck, B. (2015). What's in a name: An analysis of impact investing understandings by academics and practitioners. *Journal of Business Ethics*, *132*, 449-475.

International Monetary Fund. (2009). *World economic outlook: Crisis and recovery* (World Economic and Financial Surveys). International Monetary Fund.

Israelsen, C. (2005). A refinement to the Sharpe ratio and information ratio. *Journal of Asset Management, 5*(6), p. 423. doi:10.1057/palgrave.jam.2240158

Jensen, M. C. (2002). Value maximization, stakeholder theory, and the corporate objective function. *Business Ethics Quarterly, 12*(2), 235–256. https://doi.org/10.2307/3857812

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

Jones, S., Van der Laan, S., Frost, G., & Loftus, J. (2008). The investment performance of socially responsible investment funds in Australia. *Journal of Business Ethics*, *80*, 181-203.

Kaizoji, T., & Miyano, M. (2019). Stock market crash of 2008: an empirical study of the deviation of share prices from company fundamentals. *Applied Economics Letters*, *26*(5), 362-369.

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

Le Maux, J., & Le Saout, E. (2004). The performance of sustainability indexes. *Finance India*, *18*, 737.

Lean, H. H., Ang, W. R., & Smyth, R. (2015). Performance and performance persistence of socially responsible investment funds in Europe and North America. *The North American Journal of Economics and Finance*, *34*, 254-266.

Lee, K. & Lu, S. (2021). The Impact of COVID-19 on the stock price of socially responsible enterprises: An empirical study in Taiwan stock market. *International Journal Of Environmental Research And Public Health.*

Lee, D. D., Humphrey, J. E., Benson, K. L. & Ahn, J. Y. K. (2010). Socially responsible investment fund performance: The impact of screening intensity. *Accounting & Finance*, 50(2), pp. 351-370. doi:10.1111/j.1467-629X.2009.00336.x

Leite, P., & Cortez, M. C. (2015). Performance of European socially responsible funds during market crises: Evidence from France. *International review of financial analysis*, *40*, 132-141.

Lins, K. V., Servaes, H., & Tamayo, A. (2017). Social Capital, Trust, and Firm Performance: The Value of Corporate Social Responsibility during the Financial Crisis. *The Journal of finance (New York), 72*(4), 1785-1823. https://doi.org/10.1111/jofi.12505

Lönnroth, M., Savilaakso, A., Sievänen, R. & Hyrske, A. (2012). *Vastuullinen sijoittaminen*. [Helsinki]: Finva.

Manda, K. (2010). Stock market volatility during the 2008 financial crisis. *Glucksman fellowship program student research reports: 2009-2010*, *87*.

Markowitz, H. (1952). Portfolio selection. *Journal of Finance, 7*(1), pp. 77-91. doi:10.1111/j.1540-6261.1952.tb01525.x

McInerney, M., Mellor, J. M., & Nicholas, L. H. (2013). Recession depression: mental health effects of the 2008 stock market crash. *Journal of health economics*, *32*(6), 1090-1104.

Mollet, J. C. & A. Ziegler. (2014). Socially responsible investing and stock performance: New empirical evidence for the US and European stock markets. *Review of Financial Economics: 23, 208-216.*

Montiel, I. (2008-09-01). Corporate Social Responsibility and Corporate Sustainability: Separate Pasts, Common Futures. *Organization & environment, 21*(3), 245-269. https://doi.org/10.1177/1086026608321329

MSCI (2025) https://www.msci.com/documents/10199/904492e6-527e-4d64-9904-c710bf1533c6

Murthi, B., Choi, Y. K. & Desai, P. (1997). Efficiency of mutual funds and portfolio performance measurement: A non-parametric approach. *European journal of opera-tional research, 98*(2), pp. 408-418. doi:10.1016/S0377-2217(96)00356-6

Nikkinen, J., Rothovius, T., Sahlström, P., Sahltsröm, P. & Sinivuori, E. (2002). *Arvopa-perisijoittaminen*. Helsinki: WSOY.

Nofsinger, J. & A. Varma. (2014). Socially responsible funds and market crises. *Journal of Banking & Finance*

Reilly, F. K. (2002). *Investment analysis and portfolio management*

Renneboog, L., Ter Horst, J., & Zhang, C. (2008). Socially responsible investments: Institutional aspects, performance, and investor behavior. *Journal of banking & finance*, *32*(9), 1723-1742.

Pathak, P., & Dattani, P. (2014). Social return on investment: three technical challenges. *Social Enterprise Journal*, *10*(2), 91-104.

Pérez, L., Hunt, V., Samandari, H., Nuttall, R., & Biniek, K. (2022). Does ESG really matter—and why. *McKinsey Quarterly*, *60*(1).

Petkova, R. (2006). Do the Fama–French Factors Proxy for Innovations in Predictive Variables? *Journal of Finance, 61*(2), pp. 581-612. doi:10.1111/j.1540-6261.2006.00849.x

PRI (2020). About the PRI. https://www.unpri.org/pri/about-the-pri

PRI (2022). Reporting Framework glossary. Principles for Responsible Investment. https://www.unpri.org/reporting-and-assessment/reportingframework-glossary/6937.article

Revelli, C., & Viviani, J. L. (2015). Financial performance of socially responsible investing (SRI): what have we learned? A meta-analysis. *Business Ethics: A European Review*, *24*(2), 158-185.

Sandberg, J., Juravle, C., Hedesström, T. M., & Hamilton, I. (2009). The Heterogeneity of Socially Responsible Investment. *Journal of business ethics, 87*(4), 519-533. https://doi.org/10.1007/s10551-008-9956-0

Sauer, D. A. (1997). The impact of social-responsibility screens on investment performance: Evidence from the Domini 400 Social Index and Domini Equity Mutual Fund. *Review of Financial Economics, 6*(2), 137–149. https://doi.org/10.1016/S1058-3300(97)90002-1

Scholtens, B., & Willard, F. (2024-11). One size does not fit all: Responsible investor motivation and investment performance. *Corporate social-responsibility and environmental management, 31*(6), 6075-6082. https://doi.org/10.1002/csr.2905

Schueth, S. (2003). Socially Responsible Investing in the United States. *Journal of Busi-ness Ethics, 43*(3), pp. 189-194. doi:10.1023/A:1022981828869

Semenova, N., & Hassel, L. G. (2015). On the validity of environmental performance metrics. *Journal of business ethics*, *132*, 249-258.

Sharpe, W. F. (1966). Mutual Fund Performance. The Journal of Business, 39(1), pp. 119-138. doi:10.1086/294846

Sharpe, W. F. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk. *The journal of finance*, *19*(3), 425-442.

Slaper, T. F., & Hall, T. J. (2011-03-22). The triple bottom line: What is it and how does it work? *Indiana business review, 86*(1), 4.

Slimane, F., Mehanaoui, M., & Kazi, I. A. (2013). How does the financial crisis affect volatility behavior and transmission among European stock markets?. *International Journal of Financial Studies*, *1*(3), 81-101.

SP Global (2025) https://www.spglobal.com/spdji/en/indices/equity/sp-500/#overview

Statman, M. (2004). What do investors want? The Journal of Portfolio Management, 30, 153–161

Syed, A. M. (2017). Socially responsible: Are they profitable? *Research in International Business and Finance.*

Taylor, J., 2009. The financial crisis and the policy responses: An empirical analysis of what went wrong. Crit. Rev. 21, 341–364.

Townsend, B. (2020). From SRI to ESG: The origins of socially responsible and sustainable investing. *The Journal of Impact and ESG Investing*, *1*(1), 10-25.

Treynor, J. L. (1965). How to rate management of investment funds. *Harvard business review*.

Trinks, P. J., & Scholtens, B. (2017). The opportunity cost of negative screening in socially responsible investing. *Journal of Business Ethics*,140, 193–208.

Wagemans, F. A., Koppen, C. K. V., & Mol, A. P. (2013). The effectiveness of socially responsible investment: a review. *Journal of Integrative Environmental Sciences*, *10*(3-4), 235-252.

Wallace C. (2017). What is negative screening? https://www.theimpactivate.com/whatis-negative-screening/

Wang, H., Tong, L., Takeuchi, R., & George, G. (2016). Thematic Issue on Corporate Social Responsibility CORPORATE SOCIAL RESPONSIBILITY: AN OVERVIEW AND NEW RESEARCH DIRECTIONS. *Academy of Management journal, 59*(2), 534-544. https://doi.org/10.5465/amj.2016.5001

Yingxu, Y. (2020). The impact of ESG performance during times of crisis. *Perspectives*, *53*.