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Value creation with passive socially responsible exchange-traded funds

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ABSTRACT:

Using a unique data set of 121 U.S. equity ETFs from January 2010 to December 2020, this thesis studies whether passive socially responsible exchange-traded funds overperform their passive counterpart that does no socially responsible screening. Further, this thesis examines what are the strategies (inclusion or exclusion) and attributes (ESG and product-related) that drive the performance results.

Socially Responsible Investing (SRI) has grown substantially during recent years in asset size and as products that incorporate the idea of "doing good while doing well." Socially responsible investing seeks to deliver returns while evaluating the long-term impact of a company's business policies on society and on the environment. Mutually exclusive, the exchange-traded funds (ETFs) are growing substantially in assets under management and product offering. While expensive active asset management steers investors towards passive and less expensive alternatives, the ETFs offer a transparent and cost-efficient way to practice different investing styles like the SRI. The SRI ETFs are a recent financial innovation, academic interest is emerging, and this thesis intends to fill it by examining the existing literature of SRI and ETFs individually and combined.

The empirical part of this thesis provides answers for investors considering SRI ETFs. An equally weighted SRI ETF portfolio underperforms the passive counterpart of an equally weighted portfolio of passive S&P500 ETFs significantly on the longest sample period of January 2010 to December 2020. However, the periods after January 2015 offer distinctive results as the SRI ETF portfolio overperforms the counterpart. It seems to be relating to the development of SRI ETFs that substantially grew in asset size and products after 2015. Furthermore, it seems to be the ETFs using Environmental Inclusion (positive screening) as a strategy that drives the SRI ETF sample group abnormal returns. The ETFs using Environmental Inclusion overperform the other screening strategies statistically and economically significantly.

This thesis provides evidence that financial performance does not consistently exclude sustainable performance and that by choosing a passive socially responsible ETF, investors can "do good while doing well."

KEY WORDS: Passive asset management, socially responsible investing (SRI), exchange-traded funds (ETFs), Environmental, social governance, ESG, Modern Portfolio Theory

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Acronyms

AUM	Assets Under Management
CAPM	Capital Asset Pricing Model
CRSP	Central for Research in Security Prices
CSR	Corporate Social Responsibility
CFP	Corporate Financial Performance
CSP	Corporate Social Performance
ESG	Environmental, Social, Governance
ETF	Exchange Traded Fund
EU	The European Union
NAV	Net Asset Value
NYSE	New York Stock Exchange
PRI	Principles of Responsible Investing
RIC	Regulated Investment Company
SEC	The Securities and Exchange Commission
SIB	Social Impact Bond
SIF	The Forum for Sustainable and Responsible Investment
SRI	Socially Responsible Investing
TER	Total Expense Ratio
TNA	Total Net Assets
UCITS	Undertakings for Collective Investment in Transferrable Securities
UK	The United Kingdom
UN	The United Nations
US	The United States

1 Introduction

The fundamental function of investing is the expectation of obtaining an additional profit or income in the future. The history of financial markets and investing is everlasting and encompasses many different trends as well as many famous practices. Among recent financial market trends, socially responsible investing and passive asset management have turned from a minor niche to mainstream style investing. Furthermore, these two phenomena are emerging different strategies and instruments to practice them (UN PRI, 2020.)

Interest in sustainable development is recognized worldwide, and it continues to be one of the most talked-about topics in society nowadays. Sustainable investing generally refers to acronyms like socially responsible investing (SRI) in addition to consideration of environmental, social, and corporate governance (ESG) issues. Socially responsible investing seeks to deliver returns while evaluating the long-term impact of a company's business policies on society and on the environment. Investors are not only seeking financial returns but additionally they are also promoting environmental and social objectives. When interest and awareness towards these issues arise among investors and increasing demand from legislators, they are corollary resulting in companies to integrate socially responsible and sustainable matters into their business processes (Renneboog, Horst & Zhang, 2008). Whatever the effect is on companies, previous evidence (Waddock, Bodwell & Graves, 2002; Konar & Cohen, 2001) suggests that environmental, social, and governance issues impact companies' value, and managers can no longer ignore this.

It was not long when this niche investment style started developing, and the asset managers began to practice SRI and incorporate the ESG issues into their investment decision-making process and investment analysis. Socially Responsible Investing (SRI) has grown substantially during recent years in asset size and as products that incorporate the idea of "doing good while doing well." Socially responsible funds began excluding stocks that deal with tobacco, alcohol, gambling, and fossil resources, usually referred to

as “sin-stocks.” Further, the SRI funds use different screening strategies like inclusion (positive screening), where the asset manager selects stocks with the best ESG attributes, and exclusion (negative screening), where the asset manager rules out the stocks with the worst ESG attributes (Nofsinger and Varma, 2014).

Simultaneously, another relatively new financial phenomenon is gaining popularity among academic researchers and investors. Passive asset management and index investing have been grounding reasons for a relatively new investment innovation: The Exchange Traded Funds (ETFs). As French (2008) research suggests, active asset management costs are comparatively high, and it steers investors towards passive asset management strategies. The majority of the ETFs typically seek to follow a specific index’s performance, as an index mutual fund does, but ETFs vary in many crucial ways from the mutual funds. More of the differences are described later in this thesis. Passive asset management results in fewer transactions, leading to more cost-efficiency. Also, it avoids the risk creation through untimely or mistakenly treated actively managed assessments. The ETFs are growing substantially in assets, diversity, and market significance after their appearance in the financial markets. Among studies, ETFs have evidence of their efficiency in the financial market, and investors are well aware of these possibilities. Up to this date, there are several ETFs available to invest in a socially responsible manner and this study identifies 121 SRI ETFs during the sample period.

Riedl and Smeets (2017) shed light on the question of why investors hold SRI funds. Their study finds that intrinsic social preferences and social signaling are important elements for investors to hold SRI funds. Financial motives also play a role but to a lesser extent since investors are willing to pay higher management fees, and they expect SRI funds to underperform the conventional counterpart. Furthermore, investors with a longer investment horizon are willing to choose SRI funds.

These two trends have the potential for dramatically reshaping the broader investment landscape, like their year-to-year growths are proven to be nonetheless remarkable. Socially responsible investing remains influential in the investors’ minds and legislators’

minds forcing companies to consider environmental and social issues. Mutually exclusive, investor's interest in cost-efficient and easily distributed investment solutions is only likely to validate ETFs market growth. While the SRI ETFs usually have higher sustainability rankings than the conventional counterparts, they still have higher costs due to strict screening strategies.

This thesis will merge these two phenomena by examining the existing literature of these two subjects. Using a unique dataset of U.S. equity SRI exchange-traded funds for the period of January 2010 to December 2020, this thesis investigates passive SRI ETFs' performance over a passive ETF counterpart that follows the S&P500 index. Further, this study empirically tests what are the ESG attributes and strategies in the SRI ETFs that create value for investors.

1.1 Hypothesis development and purpose of the study

As socially responsible ETFs being a current topic, academic interest is emerging, and this thesis intends to fill it. This study's primary purpose is to examine whether socially responsible ETFs generate alpha for investors over the conventional counterpart and what are the strategies (inclusion or exclusion) and attributes (ESG and product-related) that drive the results. There are many studies examining the effect of socially responsible investing on financial performance (e.g., Bauer, Koedijk & Otten, 2005; Chang, Nelson & White, 2012; Nofsinger & Varma, 2014), yet none of them focus on ETFs. This thesis aims to provide answers for investors considering ETFs as well as socially responsible investing issues. It offers a comprehensive review of passive and active asset management, ETFs, socially responsible investing, and why and how these topics are generating value for investors.

Because socially responsible ETFs are a relatively recent financial instrument, there is not much research nor data on socially responsible ETFs nor their performance. However, it has gained much attention from individual investors. While existing literature is mainly

focusing on socially responsible mutual funds, this study examines ETFs and their potential for creating financial performance with SRI. Indeed, year-to-year growths of both ETFs and SRI give evidence that there is something the investors value in these investments. There is much evidence that investors pay a price for investing in a socially responsible way (Girard, Rahman & Stone, 2007; Renneboog et al., 2008; Humphrey and Tan, 2014). Alternatively, there is evidence that integrating SRI into financial investments they can outperform the conventional counterpart (Derwall et al., 2005; Kempf and Osthoff, 2007; Bebchuck et al., 2009). Concluding on all of these examples, the first hypothesis in this thesis is the following:

H1: Passively managed socially responsible ETFs are not consistently losing to passive ETF counterparts with no SRI screening.

Another objective is to examine whether the different ESG attributes create value differently and that the different screening methods (exclusion and inclusion) affect these ETFs' financial performance. There is evidence that different socially responsible attributes might have different effects on financial performance. For example, Derwall et al. (2005) find firm-specific abnormal returns on environmentally clean firms, Edmans (2011) and Derwall et al. (2011) on firms with high employee satisfaction, and Bebchuck et al. (2009) on firms with good corporate governance, and Kempf and Osthoff (2007) on firms with good environmental performance. Humphrey and Tan (2014) argue that using exclusion can result in increased risk and lower returns. In contrast, Nofsinger and Varma (2014) show overperformance for funds that use positive screening in the ESG dimension. Similar to Nofsinger and Varma (2014), this thesis aims to examine the differences between screening strategies used (inclusion and exclusion) by SRI ETFs and what are attributes (ESG and product-related) that create the value in the SRI ETF data sample.

H2: Alphas vary between the different ESG attributes and screening strategies used in the SRI ETF sample group.

While there is much existing literature combining social responsibility and mutual funds, there is not much evidence on SRI ETFs' performance. It is crucial to understand can these instruments offer a better alternative to mutual funds or other similar investing products. Since both the ETFs and social responsibility are gaining attention and attracting investors, it is essential to understand can these two phenomena create consistently better alpha in the passive asset management field. The socially responsible value is takin place in more extensive time periods, passive asset management and further ETFs offer a cost-effective way to practice this idea of doing good. Therefore, the study focuses on the last 11 years, offering the longest and most comprehensive research about SRI ETFs' performance.

This thesis will offer answers for investors considering passive asset management over the active counterpart, and social responsibility as an investment philosophy, and ETFs as an instrument to practice these styles.

1.2 Structure of the thesis

This thesis consists of eight main chapters. The subchapter is an introduction of the topic, and it reasons why the topic is urgent for research. Additionally, the chapter argues what kind of question this thesis intends to fill.

To fully comprehend socially responsible ETFs' performance, one has to understand the basics of these two phenomena. The second chapter aims to extensively review the theoretical background required to understand the asset management industry and the differences between active and passive asset management. The third chapter discusses the creating process of the ETFs and what kind of strategies they include. The third chapter also presents the history of ETFs and why they are gaining so much attention from investors. The primary reason for this chapter is to understand what kind of investment product the ETFs are.

The fourth chapter presents the theoretical framework of socially responsible investing. Additionally, the fourth chapter introduces the market status of socially responsible investing and the strategies in this investing style. The fourth chapter's primary purpose is to describe and discuss social responsibility as a potential to add or destroy the investor's expected return of future investment value. The fifth chapter wraps up these two topics presented in the theoretical chapters of the ETFs and SRI. It presents the existing literature of these two phenomena as a combined investing product. Furthermore, the chapter evaluates other studies and discusses the potential of these investment instruments.

After the literature review, the study moves on to the empirical part of this thesis. It presents the unique data set, how it is collected, and further what kind of methodology and empirical models are used to answer the research question. Chapter seven will present the results and analyze the results retrieved critically. Finally, chapter eight discusses the results and concludes the whole thesis.

2 Passive versus active asset management

This chapter describes the change in the asset management industry and how passively managed investment products are recently gaining popularity among investors, and further, why they offer an attractive alternative to the actively managed counterparts. The following chapter also describes the underlying theories, such as the modern portfolio theory introduced by Markowitz in 1952 and the efficient market hypothesis by Fama in 1970. This chapter considers open-end funds like mutual funds and exchange-traded funds to be in the passive asset management category. Next chapter discusses the differences between exchange-traded funds and mutual funds.

Today's investors enjoy countless investment products and vehicles to set their money into as an expectation of future profits. A wide range of actively managed portfolios and passively managed portfolios are available for investors to create their investment portfolios and achieve their investment objectives. Still, not forgetting traditional asset classes like common stocks, bonds, cash equivalents, and real estate (Bodie et al., 2014). However, only seventy years ago, the asset management field was formed mainly of actively managed investment products, and no passive management products existed. In his study, Sharpe (1963) suggests a shift to passively managed products.

The financial crisis of 2008 started an exponential shift in the asset management field. The investors started to demand transparent investment vehicles with lower risk exposures as the crisis was occurred by risky and not investor-friendly alternatives like derivatives such as credit default swaps. Also, investors lacked confidence towards banks and financial institutions who generally are the asset managers. The focus from actively managed funds shifted towards passively managed funds measured in assets under management terms. The years 2005 and 2006 were the last two consecutive years that actively managed U.S. equity funds had back-to-back inflows. The assets under actively managed assets have grown but not like before. Actively managed U.S. equity funds have had outflows in 11 out of the last 12 years, while the passively managed U.S. equity funds have had extreme inflows after 2008. Figure 1 below presents that the passively

managed U.S. equity funds have caught up with the actively managed counterparts. Both were totaling at $4.3 trillion assets under management, reaching asset parity. The passively managed chart includes both mutual funds and exchange-traded funds. (Morningstar, 2019a).

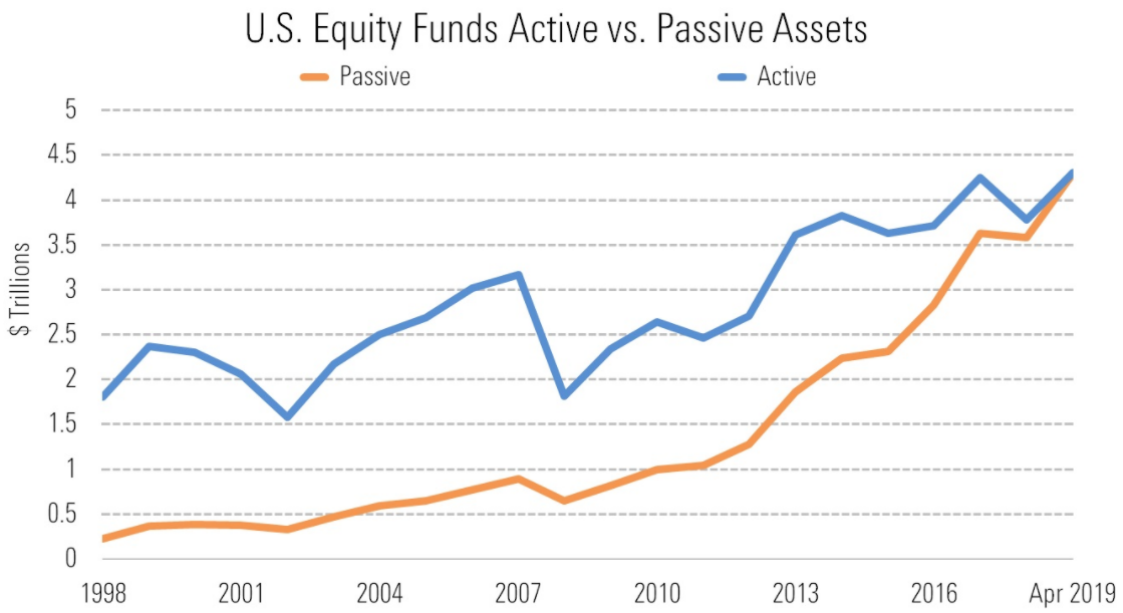

Figure 1. U.S. Equity fund flows between passive and active funds. (Morningstar, 2019a).

The origin of passive asset management can be linked to the capital asset pricing model that is emerged from the modern portfolio theory by Markowitz (1952) and the efficient market hypothesis by Fama (1970). One way to define passive asset management is to hold a diversified portfolio of assets without an effort on a security analysis to improve portfolio performance. Therefore, a passively managed portfolio or strategy has a minimal amount of additional input and relies on the benefits of diversification while trying to match the performance of a specific benchmark index. This kind of passive asset management strategy agrees that the financial markets are efficient and the prices contain all available information. (Fabozzi and Markowitz, 2011).

There are two kinds of passive asset management strategies: an indexing strategy and a simple buy-and-hold strategy. The indexing strategy is the more common one. The investors rely on a diversified portfolio of assets that follows a benchmark index's

performance without attempts to identify any best performing stocks or emphasis of forecasting the stock market movements. Nonetheless, the buy-and-hold strategy involves elements of active asset management. In this strategy, the passive portfolio is purchased based on some stock selection criteria and then held for the predetermined investment period. (Fabozzi et al., 2011: 245-246).

The active asset managers assume the financial markets to be inefficient, where the active investors attempt to improve portfolio performance either by market timing or determining mispriced securities. An active asset management strategy exploits information asymmetry and uses forecasting techniques to achieve a better-expected performance than the passive investors, or the markets might achieve (Fabozzi et al., 2011). Sharpe (1991) points out how active asset managers as a group cannot beat the market. However, some managers beat the market. In the field of asset management, the overperformance results from either luck or skill of the active asset manager or investor. This skill relates to the active investor's ability to obtain better information than most other investors, or the active investor can process the acquired information more efficiently to generate additional performance (Fabozzi et al., 2011: 247). Arnott and Darnell (2003) state that since investors invest in actively managed assets, they accept the value-added concept where the active asset manager can add value for investors through market inefficiencies and anomalies.

This chapter presented the extreme forms of passive and active asset management strategies. However, one can pursue many strategies, styles, and products as a passive or active investor in real life. The thesis's interest is not to get in detail with them but rather to make a difference between extreme forms of active and passive asset management styles. To understand passive and active asset management products, one must understand the financial markets where these investment products are trading. The underlying discussion about active versus passive asset management is closely related to the tests of efficient market hypothesis and how the markets accurately price the investment products.

2.1 Asset management under the efficient market hypothesis

The foundations of market efficiency were first introduced by Bachelier (1900), who studied the stock market's behavior. Afterward, the idea of predicting stock market price movements and how the financial markets price investments were examined by Kendall (1953), who analyzed stock price behaviors over time. Kendall demonstrated that he could not identify patterns in stock price movement. This study gave basis to the discussion that stock prices follow a random walk and stock price movement is random and unpredictable. However, it was Fama in 1970 who made substantial developments for the efficient market hypothesis, which is considered to be the most influential study in the field of efficient markets (Bodie et al., 2014). In his article, Fama presents three forms of market efficiency. All of the forms in the efficient market hypothesis categorize the available information level in the financial markets. The three forms of the efficient market hypothesis are: "the weak form," "the semi-strong form," and "the strong form."

The weakest form of the efficient market hypothesis (EMH) is "the weak form" of market efficiency, and it signals the lowest level of information in the markets. All historical information available in the markets determines the asset prices. This information includes historical trading prices, old interest rates, and past transaction volumes. Fama (1970) presents the old information as unimportant as the information is not a basis for future price fluctuations. Therefore, investors who use only available information about the past cannot generate additional profit since past information is not a guarantee for the future.

The intermediate form of market efficiency is the semi-strong form. In this form of the efficient market hypothesis, the asset prices are reflecting all of the released available information about the prospect asset. For example, the released information can include financial statements, balance sheets, dividends, annual wages, and current interest rates. Fama (1970) states that in this form of market efficiency, prices reflect all the old information like in the weak form. Additionally, the current information available in the markets is reflected in prices as well. Once again, the investor cannot make any

additional profits based on the old information since stock prices will adjust again and again immediately to the news reveals that contain information regarding future stock prices.

The last and the strongest form of efficient market hypothesis suggests that all the current asset prices are set to a level where they include all available published information and all unreleased information. In this form of market efficiency, no party, like an investor or insider, has any “monopolistic access to price relevant information.” Fama concludes that even if one can obtain inside information or unreleased information, the investor cannot benefit from that since the prices reflect that information already. (Fama, 1970).

In the extreme form of the efficient market hypothesis, no one would actively analyze securities and commit resources to beat the market. Sharpe (1991) concludes that active asset management is always a zero-sum game, and after all the fees, it is a negative-sum game. To demonstrate, Sharpe considers the market portfolio to consists of passive and active investors. A passive investor holds a portfolio of securities that is the cap-weighted market portfolio. An active investor is anyone who does not hold a cap-weighted market portfolio. The aggregate market portfolio is the sum of passive and active investors, and therefore, all passive investors hold the market portfolio. The rest positions in the market consist of active investors, and as aggregate, they hold the same market portfolio. As a result, the passive investors earn according to the market portfolio before fees, and the active investors, in aggregate, earn the same market return before fees. Again, if the costs are higher for active investors, they lose to passive investors as aggregate. The only way to perform better than the market is to have skill or luck, and if a smarter active investor wins, it will be away from another active investor. Also, when taking the fees into account, the passive and active investors are both losing to the market. It can explain the increased concern in the investment field related fees and cost among investors discussed later. (Sharpe, 1991).

The actual level of market efficiency has been examined academically with conflicting results. Compared to Fama's efficient market hypothesis spectrum, historical asset performance data implies that the markets are not even weak-form efficient. Jegadeesh and Titman (1993) show significant results towards weak-form market efficiency with momentum strategy where investors can obtain abnormal returns through analyzing past asset returns. In addition, the idiosyncratic volatility anomaly (Ang, Hodrick, Xing, and Zhang, 2006) implies that prior high volatility on an asset creates lower returns in the future. Contrarily, Chordia, Subrahmanyam, and Tong (2014) and Grobys and Haga (2016) support the strong form of market efficiency. They provide evidence that most anomalies exist only for a short period of time, and anomalies' profits decrease after they have been discovered. Further, Fortin and Michelson (2005) show that not all markets are efficient.

Since the markets' efficiency is hard to capture, Pedersen (2018) demonstrates that the markets are efficiently inefficient, where the markets are in equilibrium between the efficient and inefficient. Pedersen discusses why the arithmetic of active management introduced by Sharpe (1991) cannot exist in the real financial markets. Pedersen demonstrates that the active asset managers enhance the markets to be efficient, and the efficiently inefficient markets are equilibrium of passive and active investors. Pedersen argues that since investors are paying for active asset managers in fees, the markets must be inefficient so that the active asset managers can outperform the market or the aggregate asset management field is inefficient since investors would pay fees for nothing. In addition, Pedersen points out that humans are players in financial markets, and humans are not always acting rationally. The asset managers and investors as humans can make errors, panic, herd or act in an irrational way that makes market prices fluctuate from the actual fundamental prices. Pedersen suggests that "the markets are just inefficient enough that active investors and their money managers can be compensated for their costs and risks through superior performance and just efficient enough that the rewards to money management after all costs do not encourage the

entry of new managers." Therefore, the active asset managers provide liquidity to the markets and are compensated for providing service to investors. (Pedersen, 2015).

The efficient market hypothesis is fundamental for testing different academic models in the financial markets. However, the extreme forms are generally not accepted by asset managers and investors. An important outcome is that active and passive investors need to coexist in the market equilibrium. Both parties are essential players to make the markets more efficient. The active investors' trade securities towards actual fundamental prices, and passive investors benefit from the low cost of indexing where short-term price fluctuations are not essential for their long-term performance.

2.2 Asset management under the modern portfolio theory

The underlying discussion between passive and active asset management is also affected by the portfolio creation process and allocation between different asset classes. In the modern financial markets, investors are spoiled with investment alternatives like presented before. This allocation between different assets is one of the most critical decisions the investor and asset managers do face when generating an optimal portfolio. Markowitz (1952) introduces the modern portfolio theory where risk-averse investors create optimized portfolios by enchaining expected returns without increasing the risk of the portfolio. This can be called the risk-return tradeoff. The modern portfolio theory expresses the benefits of asset diversification in portfolio construction. (Bodie et al., 2014: 215-220).

In theory, investors are considered to behave rationally, and therefore maximize utility as in profits with the given level of accepted risk. Therefore, a risk-averse investor is assumed to choose a portfolio with the lowest risk if the available portfolios are yielding the same returns. Assets with higher risk should be compensated by higher returns, all else equal. Markowitz (1952) suggests that the investors try to minimize the portfolio variance for each expected gain of return, and vice versa, maximize the expected gain of

return for each level of variance, as variance meaning of risk. Thus, the decision-making when constructing an optimal portfolio is a choice between the mean and the variance of different assets. The outcome is that the portfolio with the highest expected return might not be the best on a risk-adjusted basis. Under these assumptions, all of the possible optimal portfolios existing in the financial markets construct the investor's minimum-variance efficient frontier (Markowitz, 1952). Fama and French (2004: 26) discuss about the mean-variance model but refer to the same minimum-variance efficient frontier.

The minimum-variance efficient frontier presented below expresses all the portfolios formed by different risky assets. The risky assets mean that there is uncertainty involved in the outcome of investing in this asset. The frontier presents the optimal portfolio with the highest expected return for any level of risk. Identifying this frontier is the first step in portfolio management. All other portfolios on the frontier, below or above the global minimum variance portfolio, can be considered inefficient since investors can achieve a better risk-return tradeoff by choosing the global minimum-variance portfolio. (Markowitz, 1952).

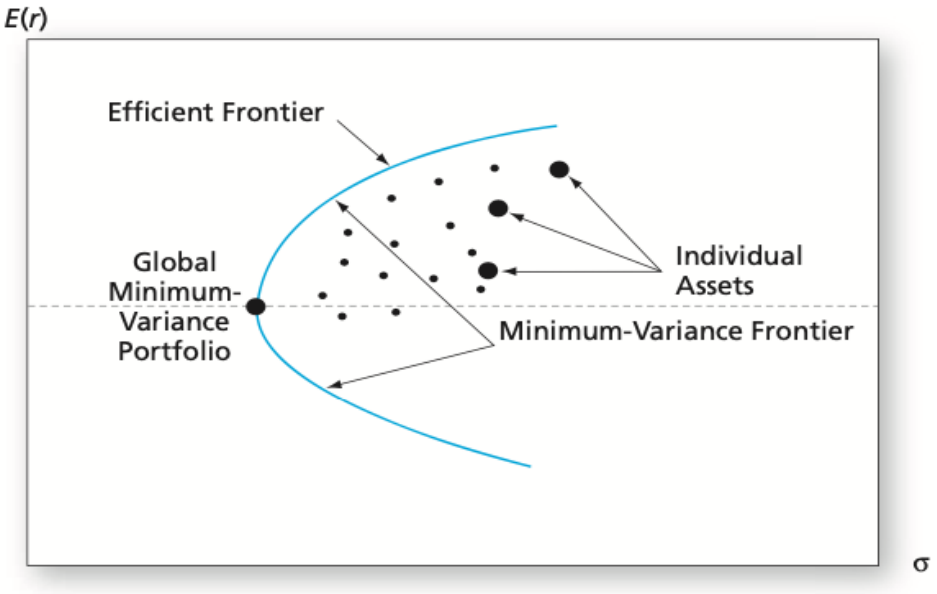

Figure 2. The minimum-variance frontier (Bodie et al. 2014: 220).

Tobin (1958) distinguished a weakness in Markowitz's model. Investors can hold cash or other assets with very low risk. The modern portfolio theory is primarily based on a diversification strategy and is concerned with covariances between risky assets. The global minimum-variance portfolio is a combination of assets with returns that are less than perfectly positively correlated. As mentioned, there are many different assets for investors to choose from. Further, a risk-free asset is as an asset as well, for which the return is known with certainty today. In finance, a risk-free asset is commonly a short-term obligation of the U.S. Government like the T-bill (Bodie et al. 2014). The separation theorem suggests that if the investor has access to a risk-free asset like the T-bill, the optimal portfolio's decision-making is absolute and independent of the investors' preference for expected return and variance (Elton and Gruber, 1997).

The separation theorem has a couple of implications. Firstly, a tangency portfolio is formed by the risk-free asset when it creates a line through the expected return and standard deviation spectrum. This tangency portfolio is a portfolio that sorts the portfolio allocation problem by maximizing the ratio of the expected return minus the risk-free asset rate of return compared to the standard deviation. Secondly, this separation theorem constitutes to the optimal portfolio so that investors can achieve it by mixing two mutual funds. In this case, one of the funds made by the risk-free asset and the other one illustrating the tangency portfolio. Therefore, investors can achieve the global minimum-variance portfolio by holding two mutual funds. Elton et al. (1997) describe this as a mutual fund theorem. In addition, Elton et al. direct the future discussion about portfolio theory to the inclusion of debt and liabilities into the asset allocation decision-making process. The asset managers and investors using leverage need to account the borrowing rate into the portfolio management process. (Elton and Gruber, 1997).

The limitations of Markowitz's (1952) modern portfolio theory are that the mean return distributions, the variance of assets, and correlations constantly move over time. Modern portfolio theory calculates the optimal portfolio for a single time period only.

Therefore, as asset management is taking place over multiple time periods, the optimal portfolio at any given time is continually changing. Mossin (1968), Fama (1970), Hakansson (1974), and Merton (1990) examine this multiple time period problem left behind by Markowitz's original work in 1952. The outcome of all the papers is that the multiple time period should be a sequence of single time periods. Hence, the optimal portfolio should differ from the one in a single time period (Elton et al., 1997).

However, essential for this thesis are the outcomes promoting passive asset management that have emerged from Markowitz's work. Based on Markowitz's modern portfolio theory, Bogle (1999) suggests that the most efficient and intelligent way to invest is using a diversified mutual fund to reduce the market risk. Samuelson (1965) suggests that investors would perform better by buying and holding a passively managed index fund rather than an actively managed fund or buying and selling individual assets. Sharpe (1963) presents that investors cannot outperform the market consistently, and a passive index would most likely beat the active asset managers. Further, Malkiel (1973) suggests that the financial markets are efficient enough that most investors would perform better by allocating their wealth into a passively managed fund to mimic the market's performance.

Finally, in 1975 Bogle established the first index fund called the Vanguard 500 index trust for passive investors to track the market performance. In the year the fund was established, it had $11 million assets under management, and by the year 1995, it had grown to $18 billion assets under management. Up to date (2020), the fund has close to $600 billion assets under management. In his 2002 paper, Bogle demonstrates how passively managed outperforms the actively managed counterpart both on an absolute and risk-adjusted basis in 8 out of 9 categories during the ten-year sample period.

2.3 Performance of passive and active asset management

The question of whether investors should be passive or active is two-folded. Both participants are required to keep the markets at an equilibrium level of efficiency, and one cannot exist without the other. Besides, this question is extreme since different degrees of passive and active asset management exists. Academic researchers and asset managers disagree whether it is the passive or active asset management strategy that performs better than the other and is always subject to different personal preferences, data samples, and time-frames.

Some researchers (Arnott et al., 2003; Fortin & Michelson, 2002; Miller, 2007) have suggested that passive asset management provides more value given the higher fees and expense ratios of active asset management. Commonly, the investors pay fees to asset managers who manage the fund through load fees in the time of purchase or sell and operation expense ratios tied to the assets under management. Since active asset managers do trade securities more often than the passive counterparts, they tend to incur more expenses. Therefore, the active investors must weigh the expected return over the risks and cost of every trade. The general consensus in the academic literature is that lower fees are preferable to higher fees since higher fees destroy the expected returns (Gruber, 1996). Carhart (1997) suggests that expense ratios, portfolio turnover, and load fees affect the portfolio performance significantly and negatively. These results are consistent with Samuelson (1965), Sharpe (1966), and Malkiel (1995).

The Morningstar 2019 study of passive and active fund fees, presented below in Figure 3, demonstrates the difference in fees that investors pay for the asset managers regarding both styles and the overall decrease in fees after the year 2000. An investor using the actively managed funds did pay fees nearly four and a half times more than a passive fund investor during 2018. This study also suggests similar results to Carhart's (1997) study. The low-cost funds are more likely to outperform the more expensive counterparts. The study by Morningstar has three important outcomes regarding asset management fees. Firstly, the investors are paying more awareness for the importance

of asset management fees which has led investors to favor funds with lower costs. Secondly, the asset managers have realized the cost awareness of investors, and they have reacted to competition by cutting fees to vie for market share from the others in the asset management industry. Thirdly, the move towards lower cost and fee-based financial advice has aroused demand for lower-cost funds like exchange-traded funds. (Morningstar, 2019).

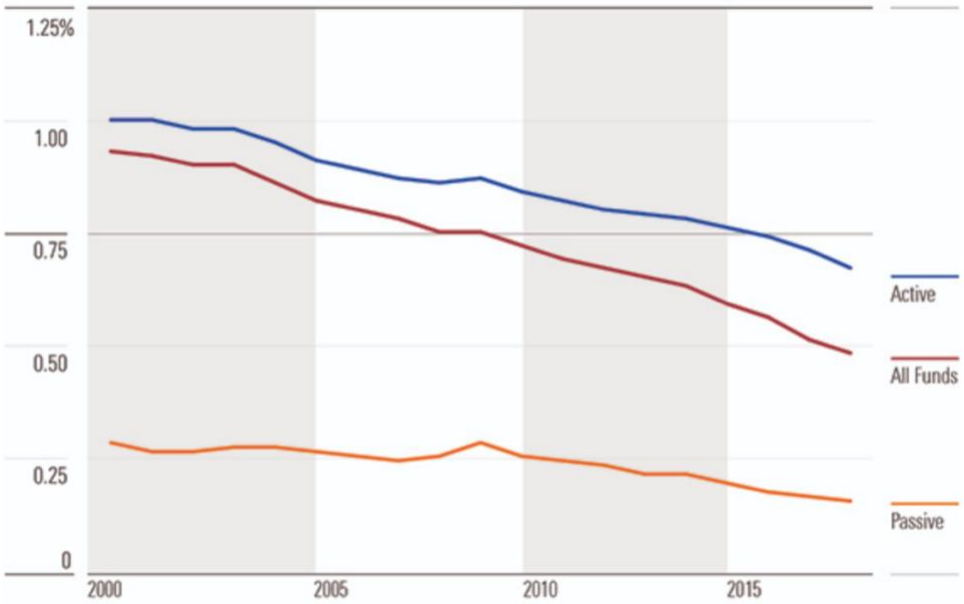

Figure 3. Asset-weighted average fees for funds as the end of 2018. (Morningstar, 2019).

Since the active asset managers charge and incur more costs, it is only rational that the call for better performance is raised and expected to justify the higher fees. Carhart's (1997) study offers slight evidence for skilled or informed asset managers who can beat the market. Carhart suggests that the performance after fees can be related to the one-year momentum effect by Jegadeesh and Titman (1993). Gruber (1996) presents that the cost factors can explain only some portion of the active asset managers' underperformance.

As a result, Chevalier and Ellison (1999) questions whether some asset managers perform better because of personal characteristics and that some asset managers are therefore more skilled than others. They focus on the asset managers' characteristics

rather than on the characteristics of the managed funds. They suggest that asset managers who have accomplished better selective undergraduate studies have better performance than asset managers with less selective undergraduate studies. In addition, they present that older asset managers perform worse than younger asset managers. To conclude, the findings suggest that some asset managers can perform better than other asset managers. This is paradoxical to the perfectly efficient market hypothesis, and the authors suggest that the difference in performance is only essential to keep equilibrium at the informationally efficient markets. (Chevalier et al., 1999).

Since few active asset managers can beat the market, studies like (Johnson and Collins, 2000) continue to call for active asset management. Their study suggests that only active asset managers can manage risk contrarily to passive asset managers. They highlight the active asset managers' ability to shift assets to alternative investments and lock in profits when they arise. Similarly to the studies (Henriksson & Merton, 1981; Henriksson, 1984; Andreu et al., 2018), who provide evidence of asset managers' market timing ability. Some studies like Grinblatt and Titman (1992) evidence the asset managers' ability to collect information efficiently and pick the right stocks to achieve better performance consistently over time.

The S&P Dow Jones Indices report (2019) studies actively managed U.S. equity funds against their benchmark indices on a risk-adjusted basis over different time periods. To account for fees, they study the performance by including the fees as well as excluding the fees. They also adjust the benchmark returns by their volatility. After adjusting for the risk factors, the actively managed U.S. equity funds do underperform their passive benchmarks indices in all time frames and including the fees. Figure 4 below presents the net-of-fee underperformance percent by active funds compared to the benchmark indices. The study shows that even after controlling the fees, most active funds do underperform their benchmarks. This study is in line with Sharpe (1991), who highlights that, as a group, the asset managers cannot beat the market, and only very few managers can do it. (S&P Dow Jones Indices LLC, 2019).

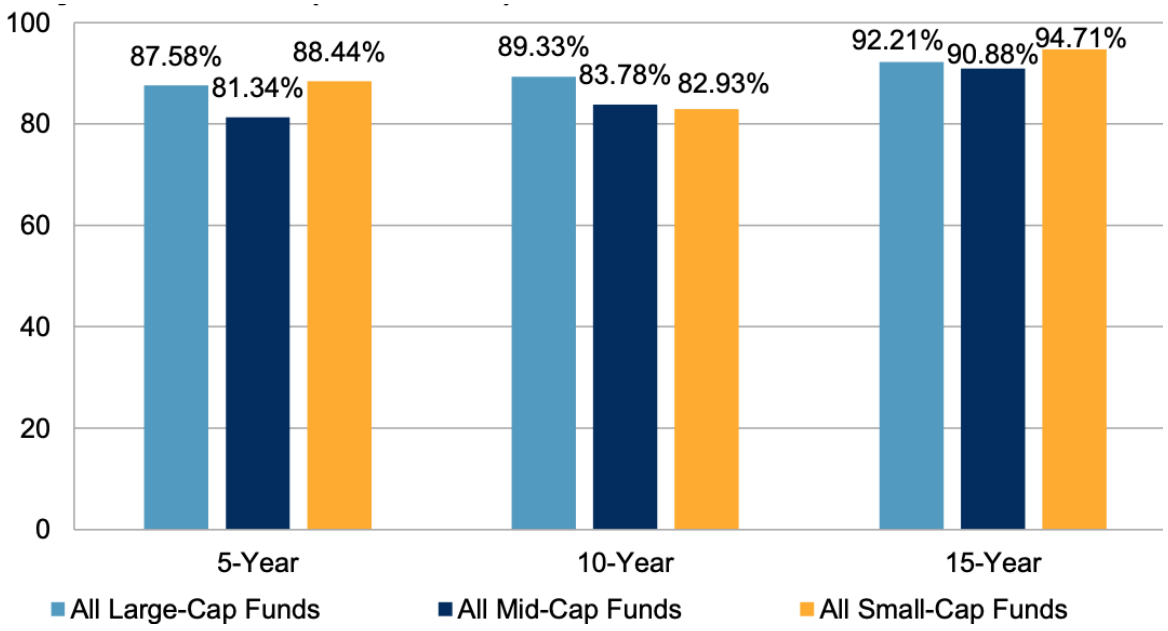

Figure 4. Actively managed U.S. equity funds outperformed by benchmarks. (S&P Dow Jones Indices LLC, 2019).

Passive asset management is one of the most successful innovations of modern finance (Blitz, 2014). Investors are increasingly shifting from actively managed products to passive investment vehicles since no consistent overperformance for active management can be identified, and a surefire way to increase profits is to lower costs. This shift is establishes on the discussion between the level of efficient markets (Fama, 1979) and modern portfolio theory (Markowitz, 1952) as well as their implications. The shift is also highly motivated by the studies on costs and performance differences. The start of passive asset management can be attached to the invention of the first index fund by Bogle (1975). However, passive asset management has always existed in the form of a buy-and-hold strategy. After the financial crisis of 2008, the investors' demand for transparent and lower-cost investment vehicles grew explosively. Therefore, exchange-traded funds have received much attention and represent one of the most successful financial innovations during the last decades (Lettau and Madhavan, 2018).

3 Exchange-traded funds – ETFs

This subtitle describes the theoretical background of a comparatively new investment instrument; The Exchange Traded Funds (ETFs). In the interest of this thesis, it is essential to understand mechanics, strategy in creating processes, and the reasons for ETFs' market share growth. As yet, it is crucial to understand the risks and costs of ETF investing.

McMahon (2005) presents the ETFs development as follows: "In the beginning, there were stocks; then came stock indexes, which offered professional assessment and instant access to multiple asset classes. Then came mutual funds, intended to lower the cost of exposure to the stock market and access multiple asset classes. Next came exchange-traded funds, hybrid security, intended to offer even better exposure, transparency, and economy to the investor."

The American Stock Exchange (Amex) introduced the first ETF in 1993 called Standard and Poor Depositary Receipt (SPDR), which was afterward nicknamed as a "Spider." The ETFs enable investors to trade entire index portfolios as they trade shares of stocks. The ETFs can is a basket of stocks that trade as a whole in an exchange. The "Spiders" were the beginning for many other similar products, designed to follow types of indexes such as DOW JONES, NASDAQ 100, or S&P500. The ETFs can follow a range of indexes from domestic to international or a more niche sector like a region or a country index (McMahon, 2005). At the end of 2019, there were around 5000 ETFs outstanding globally. At the beginning of the 21st century, ETF assets were fewer than 100 billion U.S. dollars and in 2019 counts over 6.18 trillion U.S. dollars. In addition, worldwide ETFs assets grew at an organic annualized rate of 18 percent from 2009 through 2019. ETFs were outpacing other open-end fund types by a growth rate of 4.8 percent. This is presented below in Figure 5. These numbers should be viewed over the whole $160 trillion asset universe consisting of global market value of equities and fixed income securities. (Statista, 2020; Lettau and Madhavan, 2018).

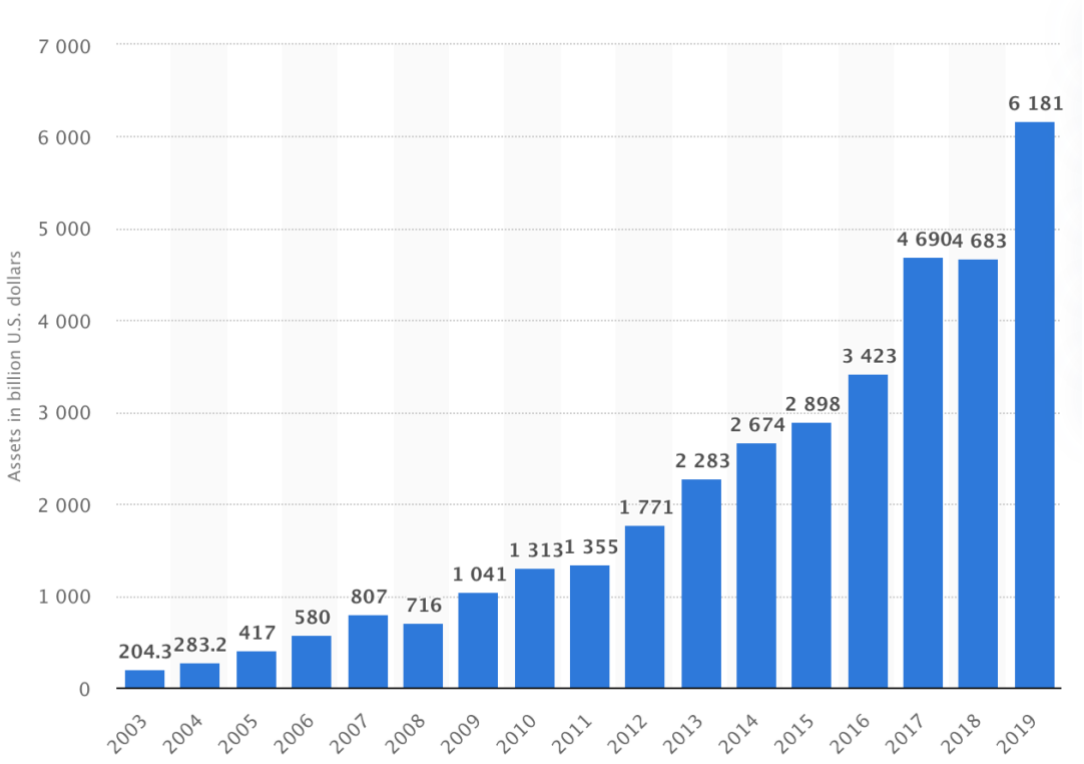

Figure 5. Assets under management of global ETFs from 2003 to 2019 (Statista, 2020).

3.1 Mechanics and characteristics of ETFs

The reasons for ETFs' market growth and popularity are many. Most ETFs seek to track a specific index just like a mutual fund does. This tracking process is indexing, which expresses the replication strategy that the ETF follows the target benchmarks assets in all market situations. However, there are also actively managed ETFs in the markets that try to outperform their benchmark index, but most of the ETFs still follow a target benchmark. Due to their index mimicking strategies, the ETFs are for long-term passive asset management. The ETFs are generally low-cost, transparent, liquid, and tax-efficient and offer easy diversification for investor's portfolios. The ETFs are relatively simple and easy to use since their similarity to common shares. They can be bought and sold in exchanges intraday, and investors can monitor prices in real-time. (Lettau and Madhavan, 2018).

Dellva (2001) critics ETFs for their intraday trading and that flexible trading rules create an environment where investors chase short-term capital gains chasing a hot sector or fund. Investors use ETFs' trading features, although these instruments are for long-term investors for them to match a specific index's performance. However, Barber and Odean (2000) provide evidence that investors trading more are prone to lower returns compared to returns from investors who trade less.

Today ETFs offer a wide range of alternatives as well. Diversification and the number of alternatives lead to an easy and extensive way for investors' risk management. Like it turns out, ETFs have characteristics from both mutual funds and common company shares. However, since they offer benefits from both, investors do not have to pick any specific share or fund but to decide the area of the markets to invest in. For example, diversification provides a good option when investing abroad. Therefore, the optimal portfolio by (Markowitz, 1952) can be achieved by combining different ETFs that maintain benefits from the different correlations between assets. The ETFs are also a convenient and cost-effective way for small investors to reach special markets that would be too expensive or otherwise complicated to access. Thus, ETFs offer new opportunities for investors like a piece of a share that would usually be too expensive to own. (Delfeld, 2007: 1-2; Lettau & Madhavan, 2018.)

Understanding ETFs mechanics better, it is easy to compare them with conventional mutual funds. A mutual fund holds the underlying assets. For example, an S&P 500 index fund holds a portfolio of shares that make up the S&P 500 index. Over time, the mutual fund manager takes the responsibility to maintain the portfolio this way, and if an investor redeems from the fund, the mutual fund manager needs to adjust the underlying portfolio by selling assets. In turn, the ETF investors operate in the secondary markets through an exchange or a broker and other liquidity providers. The intra-day transactions between investors on the secondary markets do not cause transactions in the underlying assets to which the asset manager needs to react. Therefore, the

mechanism does not lead to any transaction costs like in the mutual funds when adjusting the portfolio in case an investor redeems. (Lettau et al., 2018).

In addition, more cost benefits for ETFs arise over mutual funds when the mutual funds interact directly with the investors. Typically mutual funds incur distribution and record-keeping costs such as transfer agency costs as well as different services fees ranging from marketing to distribution that the ETFs do not face. The ETFs offer investors also more transparency since the holdings are listed daily when the mutual fund holdings are listed quarterly. The ETFs also incur tax advantages through the "in-kind" transactions that reduce capital gain distributions for investors. The "in-kind" process will be discussed later in this chapter. (Lettau et al., 2018).

The Securities and Exchange Commission (SEC) requires the ETF and mutual fund managers to publish a net asset value (NAV) for their funds. The ETFs operate contrary to mutual funds, whose sales occur only once a day when the fund's new net asset value is determined based on the component securities' last recorded quotations. So in a mutual fund, all transactions occur at the end of each trading day and at net asset value, when ETFs are traded throughout the trading day at their net asset value. The net asset value is calculated as the total value of the funds' underlying assets (the value of holdings in cash, shares, bonds, derivatives, and other securities) minus the total value of its liabilities and fees. The net asset value is then again divided with the total shares outstanding to determine each fund's share price. The net asset value formula is presented below. Both the ETFs and mutual funds NAV derives from this formula. (Lettau et al., 2018).

$$Net\ Asset\ Value\ (NAV) = \frac{Total\ assets\ of\ the\ fund - Total\ liablilities\ of\ the\ fund}{Total\ number\ of\ shares\ outstanding} \quad (1)$$

For international mutual funds and ETFs, the net asset value can be adjusted to take into account the market movements in other markets since ETFs can be listed to the U.S., but they hold securities from other markets. For example, an ETF trading in the U.S. that

holds an asset from the Tokyo exchange is valued for the closing price in Japan but adjusted for changes in the yen/dollar currency rates during the U.S. trading day. (Lettau et al., 2018.)

A significant role in the ETF markets play the so-called authorized participants. In contrast to a mutual fund, ETFs do not interact with the markets directly. ETF asset manager, like Vanguard, BlackRock or State Street enters into a contract with these authorized participants, generally large financial institution, who in return interacts with the markets and investors. The authorized participants are responsible for controlling the ETFs in the markets. They are the ones who create or redeem ETF shares that are to say, authorized participants act as dealers for the ETF shares and control, for example, the ETF liquidity. A large ETF can have 38 authorized participants as an average to minimize the risk that one would finish their activities. Creation of all of the new ETFs and current ETFs extinguished through these processes called creation and redemption. This process is the key mechanism to control the price changes and hold an ETF price as close to the target index as possible. This mechanism presented here above is called the "in-kind" mechanism and is demonstrated below in Figure 6. (Lettau & Madhavan, 2018.)

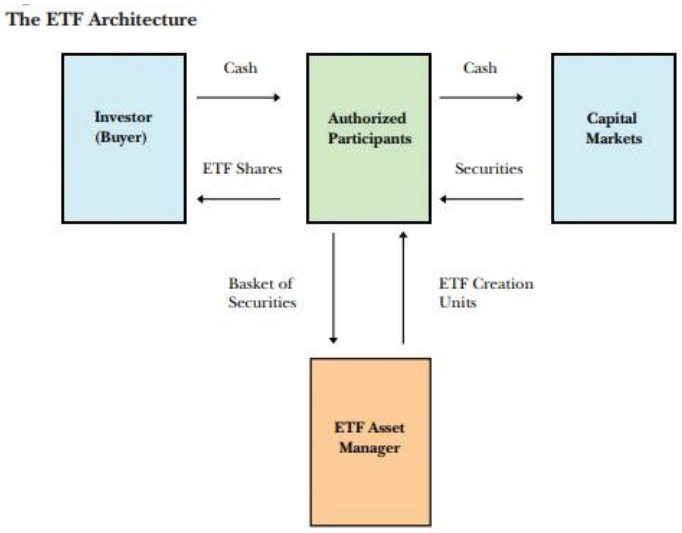

Figure 6. The ETF architecture (Lettau & Madhavan, 2018).

The ETFs trade in two distinct markets. The primary market is where the authorized participants and the ETF manager create and redeem ETF shares for underlying securities, which occurs at the net asset value of the ETF. The secondary market is the exchange where the investors sell and buy the listed ETFs. The redemption and creation process helps to keep the actual market value of the ETF and the net asset value in line with each other. The ETF intraday trading behavior might differ, and the ETF can be trading at a premium or discount to the fundamental value. This distinction from the actual value can be profitable for fast-movers who can distinguish such opportunities in time. In case the price is below the net asset value, the ETF is trading at a discount. The fast-mover can purchase ETF shares, redeem them for the underlying assets, and again sell the underlying assets to their actual market prices, which will end up the ETFs net asset value. In case the price is above the net asset value, a fast mover can do the reverse and create new ETF shares based on the underlying assets. These can also be referred to as arbitrage activities. For example, the authorized participant may trade ETFs when they estimate that security is trading at a premium, and typically, the authorized participant will lock any profit intraday. (Lettau et al., 2018).

Through arbitrage activities, ETFs increase informational efficiency in the markets by decreasing the short-term mispricing between net asset value and the market prices. Glosten, Nallareddy, and Zou (2016) demonstrate how ETFs increase the short-run informational efficiency of the ETF underlying assets, especially for smaller firms with less analyst coverage. Petäjistö (2017) provides evidence that ETFs holding liquid U.S. domestic assets are priced efficiently. In contrast, the ETFs with illiquid or international assets are economically significantly deviating with 100-200 basis points from their actual prices and therefore suggest mispricing to remain in some inefficient markets. Due to their liquidity benefits, Itzhak et al. (2018) argue that the high-frequency investors trying to benefit from the mispricing can increase the volatility of the ETFs, which is not the desired effect.

Engle and Sarkar (2006) examine the premium and discount of U.S. domestic and international ETFs from a day-to-day and minute-by-minute perspective. Their model investigates time variations of the standard deviations of these ETF pricing errors. Their result suggests that the domestic U.S. ETFs have only a small (15 basis point standard deviation on average) and highly transient pricing errors lasting only a couple of minutes, while the international ETFs have larger and longer pricing errors that can last several days. They explain this by higher transactions cost of the creation and redemption process for international ETFs in addition to wider bid-ask spreads.

The premium or discount occurs when the ETF manager is not able to track the benchmark index correctly. Therefore, the NAV returns vary from the benchmark index returns the ETF is supposed to track. The unexpected spread between the price of underlying securities in the ETF portfolio and the benchmark index price is called as a tracking error. The following equation is called the "NAV tracking error," and it is defined as in Tang and Xu (2013) and Piccotti (2018) as:

$$NAV\ Tracking\ Error\ \left(TE_{i,t}\right) = \left(r_{i,t}^{NAV} - r_{i,t}^{Index}\right) \times 100, \qquad (2)$$

where $r_{i,t}^{NAV}$ is the daily arithmetic NAV return of the ETF, and the $r_{i,t}^{Index}$ is the daily arithmetic return of the targeted benchmark index. Therefore, the NAV Tracking Error measure is positive if the ETF net asset value outperforms the index, and vice versa, negative when the benchmark index outperforms the ETF.

Piccotti (2018) suggests that ETFs usually trade above their net asset value on a premium. He argues that the ETF investors are willing to pay a premium to achieve liquidity benefits that the ETFs can provide for investors, for example, when granting exposure indirectly to inaccessible underlying securities. These inaccessible underlying securities can be foreign equities, fixed income assets, or anything the investor does not have direct access to due to high-cost accessibility or location reasons.

Gastineau (2010: 69-72) argue that some of the tracking error involved in the ETFs can be due to Regulated Investment Companies (RICs) and Undertakings for Collective investment in Transferrable Securities (UCITS) regulations. Both of these regulations are aiming to harmonize the financial markets in their continents. The U.S. Internal Revenue Code (IRC) determines specific diversification requirements for regulated investment companies to enable favorable tax-free treatment. The ETF portfolio holdings and their magnitude can restrict the tax-free distribution of interest, dividends, and capital gains to shareholders. The RIC regulation obligates that no more than 25 percent of the ETFs assets can be assets of a single issuer except the U.S. government. In addition, now in line with 50 percent of the ETFs total assets, no more than 5 percent of the assets can be from the same issuer and again expect from the U.S. government. Therefore, the minimum number of required assets is 13 as with the following allocation, two assets with no more than 24.9 percent each, and ten assets with no more than 4.9 percent each, and one asset holding the remaining 1.2 percent of the total ETF portfolio.

In Europe, the Undertakings for Collective investment in Transferrable Securities (UCITS) regulation is a bit more complex and is not regulation for tax-free treatment. This regulation is also known as the 4/10/40 rule. The ETFs under UCITS can invest no more than ten percent of total assets in transferable assets or money market securities of the same issuer. Now respect to 40 percent of total assets, the ETFs can invest no more than five percent of total assets in the same issuer's securities. Therefore, under the UCITS regulation minimum number of required assets is 15. Table 1 below presents this allocation of assets under the RIC and UCITS regulation. Gastineau (2010) notes that even with the regulations, many ETFs could meet both of these regulations' requirements relatively easily, but for many ETFs, they might cause replication hazards and therefore cause tracking error. (Gastineau, 2010: 69-72).

RIC regulation	Weights
Position 1	24.9 %
Position 2	24.9 %
Position 3	4.9 %
Position 4	4.9 %
Position 5	4.9 %
Position 6	4.9 %
Position 7	4.9 %
Position 8	4.9 %
Position 9	4.9 %
Position 10	4.9 %
Position 11	4.9 %
Position 12	4.9 %
Position 13	1.2 %
Total	**100.0 %**

UCITS regulation	Weights
Position 1	9.9 %
Position 2	9.9 %
Position 3	9.9 %
Position 4	9.9 %
Position 5	9.9 %
Position 6	9.9 %
Position 7	4.9 %
Position 8	4.9 %
Position 9	4.9 %
Position 10	4.9 %
Position 11	4.9 %
Position 12	4.9 %
Position 13	4.9 %
Position 14	4.9 %
Position 15	1.4 %
Total	**100.0 %**

Table 1. Minimum diversification requirements for RICs and UCITS. (Gastineau, 2010: 71-72).

3.2 Strategies used in forming an ETF

The extreme forms of passive and active asset management strategies are in the last chapter, and both of these can be implied to ETFs. The ETFs can have dimensions of both where the asset manager follows a specific benchmark or, on the other hand, tries to enhance the performance of the ETF compared to the benchmark. This is only a lavish breakdown. As ETFs have attracted a lot of fund inflows recently and therefore grown significantly in assets under management, diversity, and market significance, new types of ETFs have started to emerge. In addition to ETFs that follow a specific index, ETFs can be categorized to domestic and international equity ETFs, bond or fixed-income, commodity, currency, real estate, or a wide range of different ETFs that exploit, for example, a specific style like the momentum or social responsibility. However, the ETFs that track a specific index are still dominating the industry. (Lettau et al, 2018; BlackRock, 2020).

The domestic or international equity ETFs typically also track an index or benchmark of equities. The equity ETFs can cover a wide range of stocks domestically or from different countries internationally. They can also cover large or small business stocks or target sector stocks like pharmaceutical stocks, tech stocks, or banking stocks. The bond or fixed income ETFs invest in different types of bond markets, like the U.S. corporate bond markets, government bond markets, emerging bonds markets, or green bond markets. The commodity ETFs track the price changes of a specified commodity like gold, silver, or oil. The commodity ETFs usually own derivates to mimic the performance rather than owning actual commodities because storage costs for physical commodities would drive the ETF costs up. Further, there can be commodity equity ETFs that invest in stocks of commodity producers. The currency ETFs hereby invest in currencies like the U.S. dollar or Japanese yen. They either own a single currency or a basket of currencies. The real estate ETFs or real estate investment trust (REIT) ETFs invest in a type of real estate, or in a broader perspective, the real estate markets. The factor ETFs invest through a rule-based approach that targets specific return divers across all asset classes. These specific drivers can be a metric like a dividend growth, expected volatility, or high-growth potentiality. Eventually crucial for this thesis are the different styles that can be incorporated into the ETF strategy decision making like the socially responsible ETFs. (BlackRock, 2020).

Additionally, ETFs can be categorized as physical or synthetic ETFs, which means what kind of replication strategy ETFs use to form the index they try to follow. In any case, the objective of all ETFs is to follow the performance of the benchmark index with a minimal tracking error. Physical ETFs try closely replicate an index by holding the underlying securities. These securities are exchanging between the ETF manager and authorized participant. These two allow the creation and redemption of units in response to shifting demand from investors. In other words, ETFs replicate the underlying index physically investing in the underlying securities and in the same ratio as in the index. Physical ETFs are hence very transparent between the ETF and the benchmark index. However, criticism against physical ETFs is the transaction costs due to continuous trading on

securities and that they carry more tracking error when comparing to synthetic ETFs. (Maurer and Williams, 2015).

Synthetic ETFs do not hold the underlying securities in the index. Instead, they perform thorough derivatives, most commonly through swaps. The synthetic replication method is more commonly taking place in Europe because of the Undertakings for Collective investment in Transferrable Securities (UCITS) regulation (Gastineau, 2010). Successfully executed securities lending can provide significant returns and meanwhile maintain a low-risk profile. A key advantage of a synthetic ETF is that it should track an underlying index much more exact than a physical ETF due to its nature with derivatives. As a result, synthetic ETFs should carry lower tracking error risk, but they are facing counterparty risk due to securities lending. In practice, the ETF manager and the authorized participant form a swap agreement that commits to yield a particular index's return without owning the securities themselves. In return, the ETF manager pays cash to the counterparty. In addition, there are synthetic ETFs that use multiple counterparties to provide flexibility to change exposure if there were concerns about counterparties' creditability. This is done by using different parties as in ETF manager as well as in the authorized participant. However, Maurer and Williams (2015) study shows that the physical ETF follows the benchmark index with similar efficiency to synthetic ETFs, and the investor is not benefiting from carrying the counterparty risk. (Maurer and Williams, 2015).

Besides physical and synthetic ETFs, there are relatively new products called the leveraged and inverse ETFs or alternatively, called bullish and bearish ETFs. These are more active investing strategies, and both are designed to seek more performance than the benchmark depending on the market cycle. The leveraged ETFs aim to beat the underlying benchmark and deliver typically twice or three times the benchmark performance over a specific period, typically on a daily basis. The inverse ETFs aim to short the market and to deliver performance opposite to the underlying benchmark also on a daily basis. Inverse leveraged ETFs, on the other hand, try to short the underlying

benchmark by a two-to-one or three-to-one ratio. All of the three ETF strategies presented here can be considered as synthetic ETFs because derivatives are used to achieve their mentioned performance ratios. (Rompotis, 2013; Cheng & Madhavan, 2010.)

Charupat and Miu (2011) find that leveraged ETFs are mainly traded over a short time period with an average holding period of 15 days, while a one percent discount or premium might occur from the net asset value. They also document that the premiums have larger volatility compared to traditional ETFs. Murphy and Wright (2011) examine the performance of twelve commodity-based leveraged ETFs. They find that these ETFs tend to perform in the short-run as mentioned, but in the long run, they tend to fail. In addition, they find that some of their sample's ETFs performed better than stated. Tang et al. (2013) have similar results where the deviation of net asset value increases when the holding period of the ETF increases.

3.3 Risks and costs of ETFs

One of the most crucial parts of successful investment is the asset allocation and the fee structure it involves, like presented in the discussion of Marowitz's (1952) modern portfolio theory. Both of these features affect the return performance either directly or indirectly. A surefire way to improve returns over a long time period is to reduce fee structure, and the asset allocation determines the overall riskiness of the investment. Comprehending the overall costs and risks of one's investment are essential elements of successful and profitable investing.

While ETFs offer plenty of upsides, all types of investment products have both risks and costs. The ETFs are not an exception. ETFs have their characteristics regarding risks, but still, one of the risks attached to all asset classes is the *market risk*. Market risk can be mitigated indirectly by diversifying allocation on different asset classes. As mentioned

previously, ETFs can track a specific benchmark index or a portfolio, and therefore the underlying index or the investments are the primary determinants of ETF performance. Therefore, nothing will stop ETFs from falling if their underlying assets are falling. In other words, ETFs cannot avoid hazards of the underlying market they try to follow. Not to forget, ETFs are a diversified alternative since they commonly include a variety of assets. Also, *tracking error risk* occurs when ETF cannot follow or track the index due to a combination of management fees, transaction costs, taxes, and dividends. As Gastineau (2003) presents, ETFs have maintained close to the benchmark index performance before expenses, but ETFs have underperformed when expenses come to account. ETFs also face so-called *closure risks*. Closure risk is part of active markets and happens when managers liquidate the ETF and payout all the shareholders. Nearly 100 ETFs close each year what comes to the ETF universe (ETF database, 2018.)

While ETFs usually track the same indices and sectors, may their performance vary due to the holdings in the underlying assets of the ETF. Hence, in practice, ETFs tracking the same benchmark index or sector may returns vary not only in comparison to the benchmark but also with each other. This gap is so-called *composition risk*, which results from when, for example, two ETFs track the same industry, but they rely on entirely different companies or segments. Moreover, the synthetical ETFs are more exposed to allocation changes and additional volatility due to their structure of including options and derivatives. The composition risk relates closely with differing investment strategies used in the ETFs. *Methodology risk* determines the risk associated with how the investment baskets or portfolios are structured and what kind of strategies they imply. The methodologies also refer to the ETFs managing process and how asset selection and their weightings are made. (ETF database, 2018.)

Like almost any other investment product ETFs also have costs. When someone redeems or describes a mutual fund, the remaining investors bear the transaction costs incurred by the one who redeemed or described it. As mentioned before, ETFs are cheaper in transaction costs because these transaction costs are externalized compared to a mutual

fund. In other words, in ETFs, the one who redeems or describes the fund will interact directly at a market-determined price at the exchange. *Trading risk* refers to the costs of owning an ETF portfolio. From the investor's point of view, all costs like direct trading costs, brokerage commissions, sales charges, bid-ask spread, and management expense ratio affect an investment's financial performance and therefore create risks. (Lettau & Madhavan, 2018; ETF database, 2018.)

The ability to redeem the asset is also a crucial part for investors besides the profit. Determining a stock's liquidity cannot be necessarily applied to ETFs, although they trade intraday. Lydon (2015) argues that ETFs' true liquidity could be better determined as a combination of the ETFs daily trading volume and further the daily trading volume of the underlying securities. ETFs are ultimately as liquid as their underlying securities, trading conditions are more accurately reflected in implied liquidity. Implied liquidity is the evaluated measure of the underlying securities' potential to trade. This is referred to as the *liquidity risk*. The liquidity risk is typically not something to be worried about among the largest and most popular ETFs, similar to other popular investment securities considered liquid.

ETFs also encounter the so-called *counterparty risk*. The ETF basket can contain different asset classes like derivatives and furthermore swaps. Counterparty risk comes to play when dealing with securities lending what is involved when dealing with swaps. In this case of securities lending, counterparty risk is present when securities are lent to another investor for a short period. ETF buyers are at risk if the swap counterparty collapses. This is not the full story because derivatives are made for hedging, which is also the case in ETFs. The exposure on swaps can also be collateralized planned to reduce the risk of the ETF. These ETFs that use swaps tend to have lower fees and lower tracking errors compared to them without swaps. Capon (2012) reports that regulators are keen to tackle post-crisis financial instruments like ETFs. Especially, ETFs that use these swaps are under investigation because of the collateral quality of these swaps and furthermore to their lack of transparency. Regulators are not worried about the ETF structure but

about the lack of transparency in the counterparty risk. (Capon, 2012; ETF database, 2018.)

As presented earlier, the industry of ETFs has grown significantly in the recent history of financial markets. ETF database notifies that ETFs may have enhanced from the herding effect. Investors chasing the next big thing may have led to herd mentality, referred to as the *hype risk* that is involved in the ETFs. However, Rompotis (2018) examines herding patterns in the trading behavior of ETFs. The study from 2012 to 2016 examined a sample of 100 small-cap and large-cap ETFs. Rompotis study whether the ETFs tend to trade as a herding group and whether this tendency is more pronounced during periods of negative stock markets, during periods of extremely ascending or descending markets, and during periods of extremely high trading activity and intraday volatility. The study demonstrates that herding is not present with ETFs. ETFs may have hype risk, but it is not due herding effect, according to Rompotis research. Additionally, the awareness of ETFs is growing significantly as their market share grows. This also adds increased market regulation from legislators, which should decrease the risk involved. (Rompotis, 2018; ETF database, 2018.)

Index investing and passive asset management create fewer transaction costs, management costs and tend to have no marketing costs at all. Investor selling or subscribing to a mutual fund can force the fund to sell some of its investments to meet the creations and redemptions, and in consequence, it can cause existing fund holders capital gain taxation. However, this is not present with ETFs because shareholders sell their shares in exchange for other investors, and the ETF is not forced to modify any of its underlying assets. As a result of this, ETFs have lower transaction expenses and lower turnover. Therefore, potential tax benefits arise within ETFs. However, like any other asset class, ETFs encounter *taxation risks* too. ETFs investing in derivatives, commodities, and currencies face separate tax treatment because of their physical nature compared to common shares. Naturally, individual investors and ETFs are prone to the taxation of capital incomes. That is why actively managed ETFs may encounter more often capital

gain taxation than passively managed counterparts. (ETF database, 2018; Lettau & Madhavan, 2018.)

To conclude the chapter, ETFs have many benefits compared to conventional mutual funds. Not forgetting that, like any other investment product, ETFs have their risks and costs as well as strategies for how they are formed. Thus, all these things should be considered when investing in ETFs. Anyhow, there is clear evidence that ETFs market share has grown explosively, and investors are more aware of these instruments and their benefits.

4 Socially responsible investing - SRI

Sustainable development was phrased by the World Commission on Environment and Development in 1987. Accordingly, sustainability and social responsibility can be conducted to business without simultaneously interfering with economic growth. It refers to business so that the demand of present needs are inconsistent with the upcoming, yet in the end, opportunities, recourses, and economic growth of the future are not dismissing. Thus, the World Commission on Environment and Development (1987) point out that sustainable development must rely on political will. Laszlo and Zhexembayeva (2011) present an approach that builds sustainability into the organization and provides a set of tools to get the process underway. They show that sustainable business is the next phase of competitive advantage, and it has already begun due to three major trends that they have identified; declining resources, radical transparency, and increasing expectations. These three trends are at the center of attention due to how they link together all phrases of sustainability (Laszlo and Zhexembayeva, 2011, p. 6).

In finance, socially responsible investing is a continuum for the discussion of issues related to sustainability issues like climate pollution, environmental sustainability, ethical awareness, and matters like consuming resources more effectively. On the one hand, responsible investing in finance research can be a well-established field, but on the one hand, research and its subjects have developed a lot in a short time. The first studies of responsible investing have been found since the 1970s (for discussion of history, see Renneboog, Horst and Zhang, 2008 or Schueth, 2003). When the SRI market was first compiled in the United States in 1995, were the assets valued at 639 billion U.S. dollars. The US SIF Foundation’s 2018 biennial Report on US Sustainable, Responsible, and Impact Investing Trends found that SRI assets are totaling now to 12 trillion U.S. dollars, which is every one out of four dollars of the 46.6 trillion U.S. dollars in total assets under United States asset universe. This means that the growing extent is now 18-fold what it was in 1995. The report also represents a 38 percent increase over the year 2016 to 2018. (US SIF, 2018).

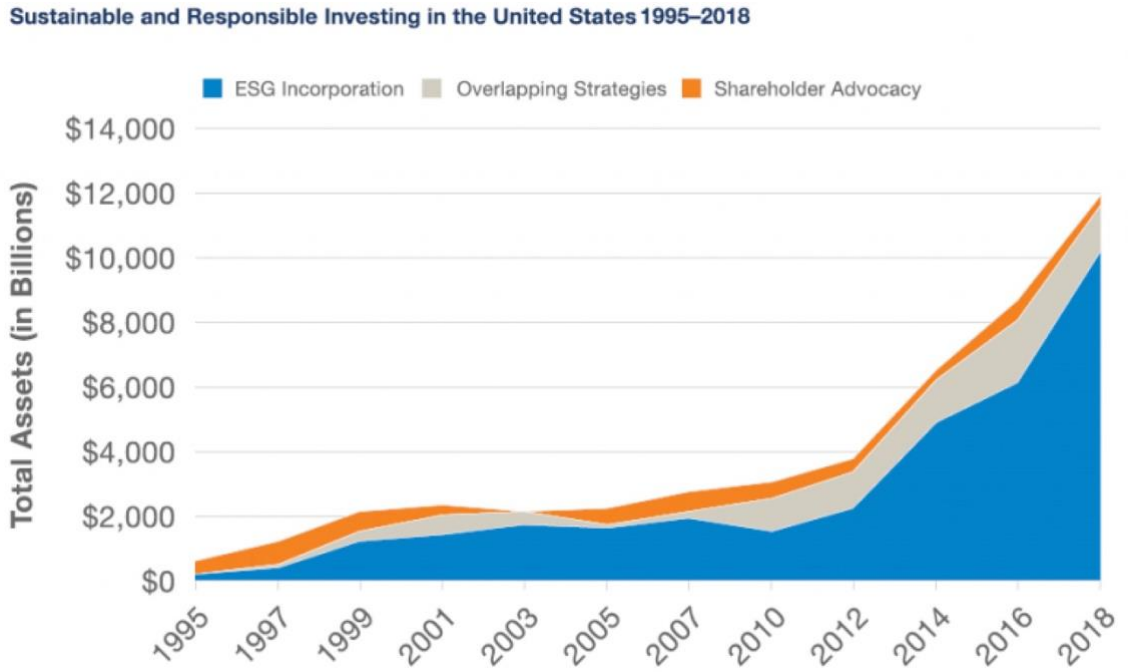

Figure 7. Sustainable and Responsible Investing in the United States 1995-2018 (US SIF, 2018).

The term “responsible investing” (RI) came into attention for a big audience with the global organization the Principles for Responsible Investment (PRI), which was founded in 2005. In April 2018, the organization had 1961 members that had approximately 82 trillion U.S. dollars under management. Figure 8 demonstrates the growth of PRI investors and assets under their management. The idea behind the organization was to turn socially responsible investing into the mainstream, which was only a minor niche before. The organization describes responsible investment as an approach to include environmental, social, and governance (ESG) issues into investment decision-making, further manage risk and create long-term returns (UN PRI, 2018). ESG and its three factors are described more under its subtitle. On the grounds of the size, prominence, and its “first-mover” status, the organization is the most crucial initiative in the global responsible investment world (Woods and Urwin, 2010). After the trendsetter PRI, smaller organizations like European “EUROSIF” and the Finnish “FINSIF” have come to exist among many other organizations that steer the same agenda in their regions (Eurosif, 2020; Finsif, 2020).

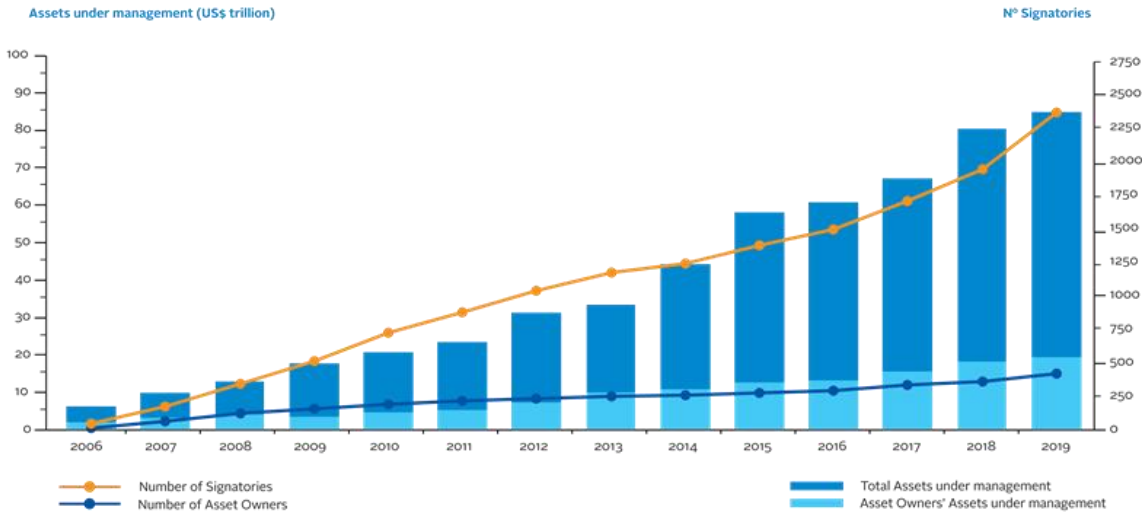

Figure 8. Assets Under PRI Management (UN PRI, 2020).

Socially responsible and sustainable investing refers to many terms and acronyms like Socially Responsible Investing (SRI), Impact investing, Ethical or Green investing, and ESG investing. The common idea behind them all is the same; investing is about generating profit, but meanwhile, take a side about non-financial measures like environmental issues. All in all, sustainable investing and all the subspecies are a form of style investing. For example, Renneboog et al. (2008) describe SRI as an umbrella term for all as follows, socially responsible investing is an investment decision-making process that merges social, environmental, and ethical consideration. Brzeszczynski and McIntosh (2014) offers another explanation where they emphasize that this socially responsible investing combines financial return with other social and environmental benefits, thus linking an investor's "social, ethical, ecological and economic concerns."

The traditional economic and finance approach suggests that firms should only meet the minimum environmental standards and legislation prescribed by law and will be averse to spend more than necessary (McCain, 1978). The general conception is that compliance with standards and legislation channels productive and profitable investments to investments with reduced profitability. For example, environmental pollution is hence a cost burden generated by the public, and reducing the public cost

leads to philanthropy, not profit maximization. In short, corporations do not have obligations or responsibility to enhance society's welfare (Friedman, 1970).

Therefore, the traditional financial theory excepts companies to maximize their shareholder's equity and, hence, investors maximize their profits (Bodie et al., 2014). Notwithstanding these arguments, studies like this one consistently focus on explaining the potential social responsibility has in creating value for investors. Thus, this question has two perspectives. Whether sustainability and responsibility create investors' financial profit and whether it creates non-financial value for investors and companies. For example, Bollen (2007) argues that investors may instead have a multi-attribute utility function that is not only based on profit maximization but also thrives on personal and societal values. Environmental, social, and all sustainable preferences are these values. Prior studies demonstrate that some investors might favor other preferences like sustainability and responsibility, even though they might suffer financial losses (Rivoli, 1995; Beal, Goyen & Phillips, 2005; Statman, 2008; Renneboog, Horst & Zhang, 2011; Hafenstein & Bassen, 2016).

4.1 Responsible investing principles and strategies

The Principles for Responsible Investing (PRI) has made its foundations on socially responsible and sustainable investing principles. They are declaring to continuously develop these principles after they were first introduced in the New York Stock Exchange (NYSE) in 2006. As mentioned, PRI is one of the most influential authors in the field of responsible investing and so on principles. (UN PRI, 2020.)

The principles are a guideline for investors, seeking and achieving long-term profits in a responsible, sustainable, and economically productive way. Implementing these principles, investors contribute to the development of a more sustainable global world and financial system through long-term value creation. These principles establish socially

responsible investing under a clear framework. (UN PRI, 2018a.) The Principles for Responsible Investing (PRI) are the following:

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

Table 2. The six Principles of Responsible Investment (UN PRI, 2020a; Hebb et al. 2017).

The paper by Hebb, Majoch, and Hoepner (2017) studies the set of attributes that contribute to the PRI's stakeholder salience and why the principles are gaining so many signatories. Based on an examination of 5 year's survey data predominantly from PRI signatories, they find that organizational and pragmatic legitimacy, utilitarian and normative power, and management values are the attributes contributing most to the PRI's salience.

What comes to other principles, The Forum for Sustainable and Responsible Investment (SIF) determines seven strategies of their own. These seven strategies align with the PRI, but they present the socially responsible investing methodology in a more practical and investor-friendly manner. Investors and asset managers can exploit the above-mentioned principles and add one or some of these strategies presented by the US SIF to their investment decision-making process. These strategies are summarized in Table 3 below.

ESG integration	• The systematic and explicit inclusion by investment managers of environmental, social and governance factors into the investment decision-making process.
Negative/Exclusionary Screening	• The exclusion from a fund or portfolio of certain sectors, companies or practices based on specific ESG criteria, such as what goods and services a company produces, or how inadequate a company or country response is to emergent risks such as climate change impacts.
Positive / Best in Class Screening	• Intentionally tilting a proportion of an investment portfolio towards positive solutions, or targeting companies or industries assessed to have better ESG performance relative to benchmarks or peers.
Norm Based Screening	• Screening of investments against minimum standards of business or government practice, for example as based on international norms such as those issued by the UN, ILO, OECD and NGOs. It may include exclusions of investments that are not in compliance with norms or standards or over and underweight.
Corporate Engagement and Shareholder Action	• Employing shareholder power to influence corporate behaviour, including through direct corporate engagement (i.e., communicating with senior management and/or boards of companies), filing or co-filing shareholder proposals, and proxy voting that is guided by comprehensive ESG guidelines.
Impact Investing	• Investments made with the intention to generate positive, measurable social and environmental impact alongside a financial return.
Sustainability Themed Investing	• Investment in themes or assets and programs specifically related to improving social and environmental sustainability (e.g. safe and accessible water, sustainable agriculture, green buildings, lower carbon tilted portfolio, community programs).

Table 3. Responsible investing strategies (US SIF, 2018).

One of the most famous SRI concepts is implementing all of the ESG factors into the investment decision-making process. SRI investing can involve both the firm valuation and the investment process. In the investment process, an investor can prefer ethical and responsible investments by some classification process or avoidance of inferior alternatives. The SRI investing and portfolio construction process considers normal risk and returns pattern but adapting the ESG factors to evaluating the firm valuation. SRI portfolios are too often considered as a weaker counterpart of risk and return, but this

cost is considered allowable because of the idea behind the investment product. While investing in sustainable, responsible, and socially acceptable firms can only result be long-term profits while managing risk differently compared to traditional diversification (UN PRI, 2020a; Bodie et al., 2014). Accordingly, adding all of the ESG criteria's next to conventional investing analysis (e.g., risk and return) qualitatively and quantitatively is one way to include ESG factor analysis, US SIF naming it as *ESG integration*. (US SIF, 2018).

Some investors may seek to include only companies with high ESG policies in their portfolios, while some may exclude companies with poor ESG records compared to others. These are called *positive* and *negative screening* or alternatively *best-in-class* and *exclusionary screening*. In the negative screening method, a fund manager usually applies a screen to a specific pool of assets, like the S&P500 stock index, and then from which the fund excludes specific assets on this pre-selected screen (Renneboog et al., 2008). Generally, socially responsible funds use a screen that excludes industries like tobacco, weapons, alcohol, and gambling[1]. While the negative screen is the oldest form of socially responsible investing, it is the positive or best-in-class screening growing together with the different ESG and sustainability scores that help the investors pick the superior assets. A fund can use one of the screens or a combination of positive and negative screens in an allocation decision-making process. (US SIF, 2018; UN PRI, 2020a).

In *norm-based screening,* a fund manager exploits globally recognized norms and legislations in investment decision-making. The asset manager can decide to exclude assets that are not in line with these norms or include only the assets that comply with the given norms. These norms can be issued by the UN or a similar agency. For example, the EU Taxonomy Regulation sets a detailed set of norms that help the asset managers and investors screen which assets are environmentally friendly and which assets do not comply with the norms. (US SIF, 2018; Eurosif, 2020).

[1] A policy that restricts "sin-stocks" is a form of negative screening. It can also be referred to as product-based screening. For example, such firms are involved with weapons, tobacco or alcohol is referred to "sin-stocks" in the literature. There has been a debate about that these instruments would yield premium returns compared to their reputation risk, but for example, a recent study from Blitz and Fabozzi (2017) find that sin-stock does not yield any abnormal returns over time.

In its simplest form, *corporate engagement and shareholder action* are any communication aligned towards corporate behavior. This can be communicated directly to management or board of the company by shareholder meetings or proxy voting. The shareholders play an active role in promoting the company towards responsible business and sustainable decisions. The investment strategy is to actively participate and communicate with the company rather than just doing an investment decision and invest in this company. (US SIF, 2018).

Impact investing refers to that utility that investors seek to impact social or environmental problems. Investors are promoting social and environmental change while seeking profit with their investments. For example, an investor can promote sustainable agriculture, clean technology, lower pollution, and then seeking to gain profit in addition to the personal utility gained from doing good. (US SIF, 2018).

The weakest form of responsible investing is *sustainability-themed investing,* where investors seek to select assets related to sustainability. These investments aim to take action towards sustainability at a more general level. The asset manager can align investments towards renewable energy, water supply, and equality (US SIF, 2018.)

There are various instruments and assets for socially responsible investing in addition to the increasing amount of principles and strategies. These can include pure stocks, Social Impact Bonds (SIBs), and green bonds. Important for this thesis, are the funds, indexes, and ETFs that incorporate some kind of socially responsible investing approach. A green bond is a fixed-income instrument specifically issued to finance socially sustainable initiatives like climate and environmental projects. Then again, a SIB is a finance contract with authority like the public sector or government where the social impact on society or area is enhanced while the profit depends on the societal impact (US SIF, 2018). This thesis will not get into detail with other socially responsible investing methods than funds and ETFs, but the point is to demonstrate that there are an increasing amount of

methods and instruments for how investors can pursue social responsibility in the financial markets.

Investors can search for a fund prospectus or fund websites to know what kind of strategy or screening method a fund exploits in the investment decision-making process. For example, SEC Edgar makes all historical or current fund prospectus publicly available that have been listed in the United States. The funds are required to publish this information. After understanding the fund strategy, one has to understand what are the attributes or the socially sustainable factors in measuring sustainability or the social impact the investment has on society or a business.

4.2 ESG – Environmental, Social, and Governance factors

Firstly, it is vital to comprehend what are the so-called Environmental, Social, and Governance (ESG) factors that investors use in the investment decision-making process. The growth in sustainability investing is related to the development of different systems of reporting information about a firm's sustainability performance. The key strategy in ESG incorporation is to add these ESG criteria's to investment analysis and portfolio construction. (US SIF, 2020.)

The link between pure positive ESG and financial performance has been studied, but no real connection has been found. For instance, ESG has has an influence on the company's characteristics in many levels, like corporate social responsibility (CSR). El Ghoul, Guedhami, Kwok and Mishra (2011) and Gregory, Tharyan, and Whittaker (2014) find that companies with good ESG characteristics have shown less exposure to risks and higher levels of valuation. Fatemi, Fooladi, and Tehranian (2017) demonstrate that the lower risk of companies with good ESG characteristics manages to have more loyal employees and customers, and thus a higher chance to survive longer and create value.

There is yet no mutual understanding of what does the entire environmental, social, and governance factors include. Figure 9 demonstrates examples from all of these factors and their focuses. For example, human rights and labor conditions are under the social factor and so on integrated into the investment decision-making process. The figure points out also that the "Avoidance of Tobacco or other Harmful Products" is also integrated into the social dimension of the three-factor analysis. This is the negative screening of "sin-stocks."

Figure 9. Examples of the ESG factors (US SIF, 2018).

The Forum for Sustainable and Responsible Investment (US SIF) annual report further demonstrates the top ESG criteria that money managers invested in 2018. Figure 10 below presents that climate change and carbon emissions were the most important specific ESG issue considered by money managers in asset-weighted terms. The criteria

was more than doubled from 2016 with a 110 percent growth. Conflict risk was the leading social criterion, and human rights came next, as demonstrated. Human rights had a 171 percent growth from 2016. Tobacco as ESG criteria is due to its negative screening process. (US SIF, 2018.)

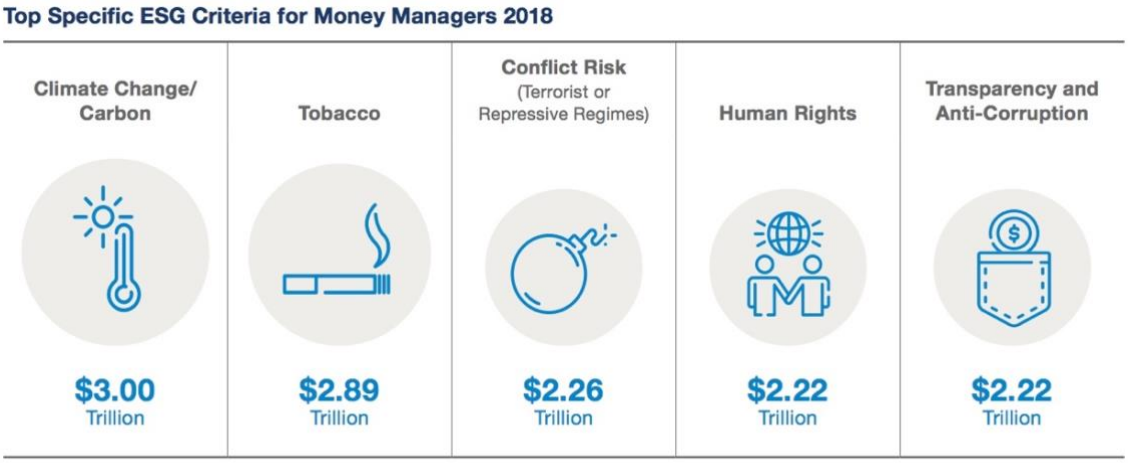

Figure 10. Top Specific ESG Criteria for Money Managers 2018 (US SIF, 2018).

Due to the enormous growth of sustainable investing and incorporating ESG analysis, several organizations offer ESG analysis and especially ESG ratings. Dorfleitner, Halbritter, and Nguyen (2015) compare three different rating providers (Sustainalytics, Sustainability Asset Management Group, and Ethical Investment Research Service) empirically approaching the level of riskiness in changes at one's ESG rating. The study suggests that investors should critically evaluate the validity of a particular ESG rating model because these ratings still lack in the convergence of ESG measurement concepts. Many other researchers point out the same that these ratings vary among the ESG rating providers, and the selection of ESG providers will affect the results (e.g., Fowler & Hope, 2007; Scarlet & Kelly, 2010). Scarlet and Kelly (2010) criticize the common understanding of the standards, weightings, and what counts as relevant data among rating providers. Halbritter and Dorfleitner (2015) therefore suggest that studies should not be limited to one ESG provider. After 2010 when RiskMetrics emerged with Morningstar Sustainability Rating, its rating gained an important position in the ESG evaluating universe, and it is thought to be one of the most advanced ones. (Morningstar Sustainability Rating, 2020.)

4.3 Value creation in a socially sustainable way

Strategic management is constantly facing a problem on how to allocate resources effectively in an environment that is placing more pressure on them through legislation and chaining aspects in the environment. Socially responsible investing is affected by many concepts and schools of thought that are in a continuous relationship with the corporation's actions and performance. Within responsible investing, it is decisive to evaluate potential investments between both financial and sustainable aspects carefully. In the interest of this thesis, it is essential to comprehend the relationship between concepts that affect to corporation's financial performance and so on affect its every stakeholder in a socially responsible way.

Stakeholders are pushing companies with high pressure to operate in a more socially responsible way. Stakeholders such as shareholders, owners, customers, activists, communities, and governments are seeking greater corporate responsibility. One source of this pressure is also the emergence of global principles, standards, and proliferation of rankings, just like ESG reporting that defines the level of corporate responsibility. Companies accepting these corporate responsibilities through governance and management can be a compelling source of competitive advantage and can show growing financial performance. (Waddock, Bodwell & Graves, 2002.)

As stated earlier, corporations do not have obligations to serve the welfare of society, and they act in their own interest (Friedman, 1970). Further, agency theory assumes that company managers to act as self-interest maximizers and motivate managers beyond their financial needs, in aggregate, creating financial losses for society. There is an apparent conflict between stakeholders and managers due to the information asymmetry. If both the principal and the agent are utility maximizers, it is only reasonable that the agent will not act every time in the principal's best interest. Thus, the principal must give incentives to limit the futile action of the agent. The concern is that managers acting as agents may not act in the best interest of stakeholders acting as principals. (Jensen & Meckling, 1976.)

Partially on an agency theory basis, Freeman (1984) introduces the stakeholder theory that bases on the idea that everyone who is a stakeholder has a claim on the organization, not only the shareowners. Stakeholder theory takes the conversation to the next level involving all the stakeholders affected by the corporation. This concept views the purpose of the organization on how managers and stakeholders should act, including each other, as well as consideration of ethics (Friedman and Miles, 2006). Hence stakeholder theory expanses the view presented in agency theory from the responsibilities of managers and shareholders to a broader point of view to serve every stakeholder affected by the corporation. Laszlo and Zhexembayeva (2011) show the relationship between stakeholders and shareholders in creating sustainable value when appreciation with each other and when common understanding increases on both sides. To conclude agency and stakeholder theory; ultimately, the stakeholders are the agents of sustainable and social control in a corporation.

In the background, the concept of Corporate Social Responsibility (CSR) is closely relating to sustainability and social performance because corporations need a broader mindset than only the classic profit-maximizing mindset. In addition, it is related to both agency and stakeholder theory from the corporation's point of view. The function of stakeholder theory in business ethics is also a tool to comprehend CSR (Kaler, 2006). Responsible investing seems to provide investors a tool to include moral considerations in their investment decision-making, where CSR is a framework for an investor to evaluate the investments and how they operate in the ESG dimensions. (Harjoto & Jo, 2011.)

CSR expresses the responsibilities that a business has on the society it operates. It can be thought of as organizational actions and policies that consider society and all the organizational stakeholders. Hill, Ainscough, and Manullang (2007) define CSR as economic, legal, moral, and altruistic actions of firms that affect relevant stakeholders' lives. CSR neither has one clear definition. The reason for this is that CSR has been tried to define in various academic attempts, and CSR varies in every business due to stakeholders involved, policies that they incorporate, or what can be thought of as

socially responsible action in one industry. The last reason why it does not have a clear definition is due to the battle of political philosophies. Political philosophies define and use CSR in their preferences, consequently trying to benefit from a single opportunity. Although CSR is mainly self-regulated, there is a call for changing CSR into control of public regulation. Comprehending CSR as self-regulated reduction and mitigation on industrial harms and furthering of the public good summarizes the urgency of CSR for creating sustainability. (Sheehy, 2015.)

Understanding the CSR and the corporate governance dynamic in value creation for investors and firms is critical. Effective corporate governance enforces managers to act in the best interest of their shareholders. Under effective corporate governance, managers employ CSR obligations to resolve conflicts among stakeholders to maximize the shareholder's wealth. As a result, CSR engagement is positively related to more effective governance mechanisms. Harjoto and Jo (2011) further claim that effective governance mechanisms, together with CSR engagement, will lead to better firm performance and value through reduced agency costs and reduced conflict of interests among various stakeholders.

Cai, Joe, and Pan (2012) examine the effect of CSR engagement of firms in controversial industries, like tobacco, alcohol, and weapons. "Sin-stocks" referring to shares from companies in controversial industries. They demonstrate the practical impact of CSR involvement on firm value with a broad sample of U.S. firms in controversial industries from 1995 to 2009. Even they find out that CSR will positively affect to corporation's value even in the controversial industry.

Krueger (2015) demonstrates how investors react strongly negatively to adverse corporate social responsibility events (e.g., corruption and scandals) and weakly negatively to positive corporate social responsibility events. Further, he demonstrates how investors value companies that can change from a history of bad corporate social responsibility actions to better and positive actions. The corporate social responsibility

action news that affects the corporations' legal and economic environment creates the biggest reactions.

To summarize, better corporate governance has a positive effect on the corporation's performance. Stakeholders are monitoring corporate managers to protect shareholder rights. This leads to better performance by reducing the agency cost presented in the agency theory.

4.4 Measuring social performance and financial performance

According to Friedman's (1970) classic argument presented before, the link between corporate social performance and corporate financial performance is ought to be negative. However, there are characters like corporate governance and Freeman's view of stakeholder theory that predicts this link to be positive. Peloza (2009) studies how to measure the impact of CSR on financial performance and provides recommendations in measuring the impacts of corporate social performance (CSP) on corporate financial performance (CFP). Besides, academia is recognizing that corporate social performance positively affects the company's financial performance. This relationship is often referred to as "doing well by doing good." (Renneboog et al., 2008, 2011; Krueger, 2015.)

Waddock and Graves introduce one of the most influential study in the field of CSP and CFP link in 1997, where they study the empirical linkages between social and financial performance. The study defines CSP as a multidimensional construct that encloses a broad range of corporate behavior about its recourses, processes, and outputs. To deal with the measuring problem, they construct an index based on eight CSP attributes rated by the firm Kinder, Lydenberg, and Domini (KLD)[2]. Using data from almost every S&P500 firm, they do find a virtuous circle between these two measurements. In their study, CSP

[2] KLD is an independent rating agency that exclusively focuses on corporate social performance dimensions and further how they are related to stakeholder concerns. Since 1991, KLD has evaluated social dimensions, and specifically how investors use it (Sharfman, 1996).

is positively affecting by prior financial performance. Thus, CSP is also positively affecting future financial performance. Their study supports the theory that good corporate governance, management, CSP, and CFP are positively related.

Subsequently, Brammer and Millington (2008) empirically study the link between CSP and CFP, and the time horizon over which the two measurements are relateing. They employ a 1-year, a 5-year, and a 10-year panel dataset for over 500 large U.K. companies. They suggest that there are significant longitudinal aspects in the relationship between CSP and CFP. Over longer periods, companies with higher social responsibility earn higher financial returns. On the other hand, these socially responsible investments may underperform compared to less socially responsible rivals over the short run. This evidence suggests the fact that it takes time to be socially responsible, and it takes time when consistent strategy development translates to higher financial performance. The study also points out that socially responsible investments are less volatile and generate a less risky opinion in the long run.

Margolis and Walsh (2003) perform a meta-analysis on 127 empirical studies of how CSP affects CFP. In these studies, almost half of the data (54) points out a positive relationship between these two measurements. Only seven studies from the analysis point out negative returns, whereas 28 studies report non-significant relationships while 20 reports varied results. This meta-analytic study suggests that companies do not suffer financially for incorporating socially responsible actions into their businesses, and there is a positive association between corporate social performance and corporate financial performance. Margolis and Walsh offer a comprehensive review of stakeholder theory and its causality relationship to these two measurements.

Barnett and Salomon (2012) argue that the relationship between CSP and CFP is U-shaped, making it a curvilinear connection between the variables. They also use KLD ratings on their empirical research on a panel of 1,214 firms and 4,730 firm-year observations from 1998 to 2006. Their study suggests the fact that firms should view CSP

as long-term. It seems that the highest and lowest levels of CSP are associated with the highest levels of CFP. However, firms with the highest levels and scores of CSP have a significantly higher return on assets and net income equal to CFP. The study indicates that improvements in social performance are subject to the learning process, and socially responsible investments take time to generate profit.

Overall, good performance in socially responsible areas results in a better financial return, and bad performance is likely to result in financial harm. Wood (2010) presents that the relationship is yet again positive between the variables, but critics that this may not be the most fruitful way to continue research in the relationship between CSP and CFP. Wood directs future research away from how CSP affects the firm and its financial performance and how its CSP affects stakeholders and society in general.

Moreover, Walls, Berrone, and Phan (2012) study the relationship between three factors of corporate governance – ownership, boards, management- and its effects on environmental performance. They address that corporate governance discussion has shifted towards contemporary social issues (e.g., climate change, labor rights, and corruption) that matter to all stakeholders. Integrating social aspects in corporate governance design, hence it is essential to performance and long-term sustainability. Their findings are in line with all other studies. Corporate governance plays a significant role in the socially responsible performance and financial performance circle.

As shown, the existing empirical literature on the CSP-CFP relationship is characterizing a vast diversity of methods. However, advocating the same results that these variables have a connection and corporate governance plays a significant role in this cycle. Reason vary depending on the study and the method used to evaluate the performance and the relationship. Considering everything under attention, it seems that socially sustainable initiatives require substantial investments and have a long-term effect on time. For investors who execute passive asset management, socially responsible ETFs create a

comfortable, passive, and cost-effective way to benefit from these long-term investments towards a better society.

4.5 The effect of socially responsible investing in financial performance

The effect of socially responsible investing on one's portfolio performance has been studied with many investing products. ETFs might be the less studied investment product that comes to the performance of socially responsible investment methods. Prior studies have focused on socially responsible investing strategies and mainly on traditional mutual funds. However, the overall findings are inconclusive because many studies have shown a positive correlation, negative correlation, and no correlation at all between socially responsible investments and superior financial performance. Results vary due to the research methods used and due to time differences. It can still be debated that what are the real effects of socially responsible investing on financial performance. This section discusses the performance of socially responsible investments in general, and socially responsible ETFs are examined under its separate title.

When more and more investors adopt socially responsible investing strategies and principles in their investment decision-making, it is only a natural outcome that more and more studies will breed out of new phenomena. Kempf and Osthoff (2007) study positive screening with best-in-class screening and its effect on portfolio performance. They find that this best-in-class screening with a high socially responsible rating and selling stocks with low socially responsible ratings leads up to 8.7 percent abnormal returns per year. The abnormal returns remain significant even after taking into account the reasonable transaction costs incurred when buying stocks. (Kempf and Osthoff, 2007.)

Renneboog et al. (2011) argue that investors value more of the socially responsible investing non-financial effects than their financial outcomes and are willing to pay a price for ethics. They find that socially responsible funds in the U.S., and U.K. as well as in

many continental European and Asia-Pacific countries, underperform their benchmarks by −2.2 percent to −6.5 percent. Their study also suggests that determinants of socially responsible funds return and risk weightings matter due to the screening methods used. Furthermore, they find that the aspect of the criteria also affects the performance. For example, environmental aspects are more likely to affect positively returns, whereas social aspects tend to have a weaker connection to positive returns.

Comparison between ethical investment funds and non-ethical funds and their benchmarks, Mallin and Saadaouni and Briston (1995) neither find outperformance or underperformance between ethical and non-ethical funds. They use several different one parameter risk-adjusted performance measures. Findings suggest that both of these funds underperform the market over the period they examine and risk-adjusted return does not vary between ethical investing style adoption.

A more recent study by Nofsinger and Varma (2014) offers distinct results. During non-crisis periods, socially responsible funds tend to underperform conventional funds. Thus conventional funds tend to give weaker returns on crisis periods. Results suggest that socially responsible funds are less risky and outperform during market crisis periods like the one during their study period 2000-2011. The study is valuable for investors with a utility function similar to Prospect Theory (Kahneman and Tversky, 1979), where the investor is more negatively affected by the loss than a profit of a similar size. Therefore, the study gives support that socially responsible investing can create value for a single investor with its downside risk prevention ability. Thus, the authors point out that the ESG funds using positive screens yield these returns compared to conventional ones.

Revelli's and Viviani's (2015) meta-analysis shows the relationship between socially responsible investing and financial performance. To conclude whether CSR and all sustainable concerns in different portfolio management are more profitable than conventional investing strategies. They identify that globally, there is no financial benefit investing in social responsibility, but the level of the financial performance of studies

involved depends on the study method used by different researchers. They present that challenge is to make companies encourage to adopt socially responsible processes; thus, they challenge companies to refocus their strategic choices to account for stakeholder expectations.

The most popular limitation or critic demonstrated towards SRI investors is that SRI funds do face diversification costs due to limited possibilities for investment allocation (Guenster, 2012). Girard et al. (2007) and Adler and Krizman (2008) provides similar results that socially responsible investors do lose on financial performance due to strict principles and screens. The criticism is aligned towards diversification since SRI investors do suffer from a limited investment instrument spectrum. Barnett and Salomon (2006) suggest that SRI investors carry more unsystematic risk because of this limited investment spectrum, and no proper diversification can be achieved. Guenster (2012) further notes that due to the strict screens, SRI funds exclude positive alpha firms. Hong and Kacperczyk (2009) find tobacco firms to earn abnormal returns on a high risk-adjusted basis and overall sin stocks to earn a positive annual abnormal return of 3 percent. Therefore, the strict principles might not allow SRI investors to allocate capital to profitable assets. However, Bello's (2005) study on SRI funds using ethical screens demonstrates that SRI portfolios are not significantly different from conventional funds regarding diversification, asset allocation, and portfolio holdings. Therefore, the SRI funds might suffer from diversification costs, but it is not always the case as the studies demonstrate contradictory results.

Prior studies demonstrate that one cannot draw valid conclusions on what comes to performance on a general level. SRI investing has a limited investment spectrum when excluding positive alpha firms with strict screens and principles (Guenster, 2012). However, investing in SRI with strict screens can investors choose the best-performing companies that indicate high abnormal returns on their investing spectrum. For example, Derwall et al. (2005) find firm-specific abnormal returns on environmentally clean firms, Edmans (2011) and Derwall et al. (2011) on firms with high employee satisfaction, and

Bebchuck et al. (2009) on firms with good corporate governance, and Kempf and Osthoff (2007) on firms with good environmental performance.

To conclude, prior studies on socially responsible investing and corresponding mutual funds. They have no significant and clear evidence of outperformance nor underperformance. The year-to-year inflows under SRI asset management and the growing extent of attention towards SRI principles and guidelines suggest that there is something more since no outperformance can be consistently found. Therefore, it is clear that investors may have other goals, like valuing non-financial goals over financial ones.

5 Previous research

As noted previously in this study, social responsibility as an investment feature and the ETFs are relatively new concepts in the field of finance. Nevertheless, they have substantially increased in recent history, and ETFs that are socially responsible are still few in numbers. There is inadequate data for greater time-series analysis of performance. Hence, this study examines the last 11 years with the widest available data set and therefore tries to fill the gap between literature and the financial markets. Academic interest has even tough emerged, and few existing studies have examined these instruments. In this chapter, we summarize the theoretical part as combining these phenomena through existing literature.

5.1 Socially responsible ETFs

Although the first ETF, “The Spider”, was launched in 1993, it was only 15 years after when the first socially responsible ETF came around, MSCI USA ESG Select NR USD (KLD) was launched on January 28, 2005. Meziani (2014) explains the slow start with the overall slow start of ETFs. Once they began to attract investors, it was only a matter of time when social responsibility as a theme was integrated into ETFs. The first socially responsible ETF was primarily focused on ESG selection. (Meziani, 2014.)

Socially responsible ETFs are investment instruments that invest primarily in socially responsible assets, defined as stocks, commodities, or fields of industries that exhibit positive environmental, social, and governance (ESG) characteristics. Socially responsible ETFs are ETFs that hold a collection of socially responsible corporations (Chakrabarty & Lee & Singh, 2017). As pointed out before, socially responsible investing can be called in many ways, and for example, Chakrabarty et al. (2017) study CSR-focused ETFs, and Sabbaghi (2011) studies “green ETFs” as both meaning socially responsible ETFs.

As demonstrated in the second chapter, the ETFs provide a cost advantage through low management fees and diversification through many assets they contain. Chakrabarty et al. (2017) describe socially responsible ETFs as good for investors who cannot identify specific socially responsible corporations that also perform well financially since the ETFs hold a collection of socially responsible assets. As the ETFs also being liquid and transparent, they generate a possibility for investors to participate markets efficiently.

5.2 Financial performance of socially responsible ETFs

Only a few existing studies are examining the value creation process of socially responsible ETFs and their effects on financial performance. These studies are presented next. However, all of the studies are limited to short time series and small sample sizes due to the recent emerging of these investment products, thus still forming all of the existing academic literature and samples of the subject.

Sabbaghi (2011) examines the recent emergence from the beginning of this phenomenon in January 2005 through October 2009, and the study is the first econometric investigation of these socially responsible ETFs. Data consists of 15 “green ETFs” that primarily invest in companies incorporating positive environmental, social, and governance (ESG) characteristics. Sabbaghi’s (2011) evidence suggests that a weak form of market efficiency exists, and market-wide “green” returns are generally uncorrelated over time. The sample median returns for the ETFs tend to be positive on a daily frequency. However, the study proves that these “green” returns are not immune to general market movements, like to the post-2008 financial crisis when market-wide “green” returns became negative. Sabbaghi (2011) further advocates that socially responsible or “eco-efficient” actions undertaken by corporations lead to more stable financial returns, thereby decreasing subsequent volatility. This study provides further evidence that socially responsible investing through ETFs can generate better risk and return ratios, especially during market volatility. Nonetheless, socially sustainable ETFs are still prone to market risk, as demonstrated before.

Meziani (2014) measures whether ESG ETFs have the potential to add value relative to the more traditional investment mandates. ESG based strategy through ETFs is considered being effective if it delivers performance above the market. Meziani's (2014) study consists of 21 samples that were existing in the overall ETF market during the research period from 2009 to 2013. A handful of the funds are able to track the performance of the benchmark closely. However, for most parts, the risk-adjusted performance of ESG ETFs lags compared to the benchmark. Meziani (2014) concludes that the performance of these ETFs seems to be way out of the risk taken to achieve returns. Despite the weak performance Meziani (2014) further presents that socially responsible ETFs will make serious strides as long as investors continue into incorporate them to their investment decision-making.

Chakrabarty et al. (2017) argue that whether corporate social responsibility (CSR) focused ETFs can add financial value for investors when also promoting socially conscious corporations. They argue that if promoting CSR involves a trade-off concerning investment results. Accordingly, to others, they suggest that socially responsible ETFs emerge as attractive for investors since they are funds that passively hold CSR corporations and have low management fees. Opposite results to Meziani (2014), Chakrabarty et al. (2017) suggest that socially responsible ETFs perform at least as well as their benchmark index, and some even outperform the corresponding benchmark. Investors can so on except risk-adjusted returns at least similar to that of the market index when they invest in CSR-focused ETFs.

To conclude these studies, results vary between researchers, methods used, periods, and the ETFs selected. The socially sustainable ETFs lack on prior research and generates urgency for further research, because the ETFs may offer a cost-efficient way to access passive asset management strategies, thus creating more value for investors financially and on other parameters.

6 Empirical research

This section of the thesis focuses on the empirical part. The first part of this chapter describes the data collection process and the data used. After, the chapter presents the methodology and the empirical models.

This thesis aims to examine whether the socially responsible ETFs can generate alpha for investors over the conventional counterpart that does no SRI screening. Further, this thesis examines what are the strategies (inclusion or exclusion) and attributes (ESG and product related) that drive the results in the SRI ETF data sample. Applying empirical research for a unique set of U.S. equity ETFs for the time period of January 2010 to December 2020, the empirical part tries to answer the research questions. The methodology is from previous academic research, mainly research on socially responsible mutual funds. This thesis mostly applies the research structure by Nofsinger and Varma (2014), who examine the socially responsible mutual fund performance over the conventional counterpart in crisis periods and what were the strategies and ESG attributes driving the results.

Testing the performance of socially responsible ETFs over the passive counterpart is done using the CAPM model, the Fama and French three-factor model (Fama and French, 1996), and Carhart four-factor model (Carhart, 1997). Many similar studies (Bauer et al., 2005; Derwall et al., 2011; Nofsinger and Varma, 2014; Halbritter and Dorfleitner, 2015) acknowledge these three models as the most suitable asset pricing models for SRI assets. Similar to Nofsinger and Varma (2014), the main empirical model is the Carhart four-factor model. Testing the performance of SRI ETFs is done on three different time periods. This is because the SRI ETF industry is growing significantly after the year 2015. The performance tests are carrying over the full sample period of January 2010 to December 2020, additionally from January 2015 to December 2020, and from January 2019 to December 2020. This is due to the growing and maturing nature of both SRI and ETF markets. As presented in the theoretical part of this study, both of the markets are having enormous growth rates during the 2015 to 2020 time period. Before this, the SRI ETFs

may not have been as advanced, and they might suffer in performance. In addition, the performance tests are investigating the net of fees and gross of fees effect to examine the possible impact of the expenses in the ETFs.

Finally, the study investigates what are the strategies (inclusion or exclusion) and attributes (ESG and product-related) that drive the results in the SRI ETFs sample. The following chapters after the data sample present the empirical models and the variables in the equations.

6.1 Data

This chapter demonstrates the data used in this study. The chapter will also discuss the data collection method as well as the descriptive statistics. The socially responsible ETFs and their benchmark closing prices are from Refinitiv Datastream, formerly known as Thomson Reuters Eikon -database, while the explanatory variables for the regressions are from the Kenneth R. French database. The data sample period in this thesis is the last 11 years, 1.1.2010 – 31.12.2020.

6.1.1 The socially responsible ETFs

This study will only focus on U.S. equity ETFs. Therefore, the study is limiting only to the ETFs in the United States and to equity ETFs. The United States is the most developed ETF market in the world, and there are the most publicly available ETFs for examination. However, the ETFs can still hold global equities. In addition, this study is excluding synthetic ETFs like the inverse and leveraged ETFs. This study also excludes other ETFs like fixed-income ETFs, commodity ETFs, and currency ETFs. This is because of their different risk profiles that may affect the financial performance of those instruments.

During the examination period of January 2010 to December 2020, this study identifies a total of 121 U.S. equity ETFs in the socially responsible ETF category. There is no all-encompassing method to identify all available ETFs with SRI objectives. Therefore the data collection process includes a couple of different searches. Similar to Nofsinger and Varma (2014), the search for active funds with an SRI objective begins at the end of the examination period. Firstly, identifying the SRI ETFs from Refinitiv Datastream that reports closing prices for 6000 ETFs. Secondly, identifying publicly available lists of SRI ETFs through the ETF database, Socialfunds, and US SIF websites to locate missing ones. Further, this study is accounting for all of the ETFs in the previous studies (Sabbaghi, 2011; Meziani, 2014; Chakrabarty et al., 2017).

Important for this study is to identify the socially responsible ETFs' fund-specific characteristics and the strategy of how the ETFs are actually creating value for the investors. Therefore, inspecting each of the ETFs prospectuses manually, the goal is to identify what kind of screening process (Inclusion or Exclusion) they use in the investment decision-making process and how is the ESG attributes generating value for investors. The process and distribution of different SRI categories follow a similar pattern as in Nofsinger and Varma (2014). All of the ETFs in this study does describe their socially responsible investing principle in their fund prospectus. SEC Edgar makes all historical or current fund prospectus publicly available. Hence, the ETFs do use an SRI strategy in their investment decision-making process (negative or positive screening), or they do invest their assets to one, some, or all environmental, social, or governance attribute, presented in the 4th chapter. See Table 4 for a distribution of the sample screen criteria.

It is important to note the survivorship bias while exanimating the performance of the ETFs or any other type of fund. The ETFs that got merged or liquidated due to weak performance or not attracting investors would cause the bias to happen. Therefore, the bias would result in an overestimation of the historical performance of any given sample since the observed spectrum would not include the funds with weak performance which is the SRI ETFs in this study. The bias would cause the performance results of the study

to be potentially skewed and enhance the performance of the remaining sample (Carpenter and Lynch, 1999). The list of SRI ETFs in this thesis contains 13 ETFs that were liquidated or merged during the examination period. Therefore, the data should be free from survivorship bias. The Refinitiv Datastream provides data for closed funds. Furthermore, using the data sample of SRI ETFs in Sabbaghi (2011) and Meziani (2014), SRI ETFs that were in existence during the beginning of the sample period in January 2010 are identified even if they were merged or liquidated after.

The final data of the SRI ETFs have 98 537 daily observation points over the 11-year sample period. The returns are calculated from a daily time-series data of an equally weighted portfolio of the 121 ETFs. Further, the returns are calculated from adjusted closing prices to account for the potential effects of dividend payments.

6.1.2 The benchmark

To compare whether the SRI ETFs perform better than the market, they need to have a benchmark. Like Cremers, Petajistö, and Zitzewitz (2012) point out that the insufficient choice of the benchmark can cause biased results. Some studies use the asset pricing models like the Fama and French three-factor model and Carhart four-factor model as benchmarks, but they may cause significant negative alphas for passive indexes. Practitioners often use a simple benchmark index to measure the performance of mutual funds and ETFs. A suitable benchmark should be a passively managed portfolio of ETFs with similar risk exposures to evaluate the added value in the passive SRI ETF portfolio (Cremers et al., 2012).

Therefore, this study compares SRI ETFs to four different S&P500 equity ETFs representing the benchmark market index. They correspond to the focus group of this thesis, and therefore, all of the ETFs are pure equity ETFs. They are not synthetic, they are issued in the U.S., and that they are representing a similar time period of 11 years. The four different S&P500 equity ETFs are from different issuers to narrow down any

effect by tracking errors or incorrectly timed equity purchases. Corresponding market index benchmark is in the study by Chakrabarty et al., 2017, who compare their SRI ETFs to different market indexes like the S&P 500 in this study. The final data of the benchmark ETFs have 11 080 daily observation points over the 11-year sample period. The returns are from a daily time-series data of an equally weighted portfolio of the four ETFs.

Similar to Nofsinger and Varma (2014), who create an additional difference portfolio between the SRI ETF portfolio and the benchmark portfolio. This study creates the difference portfolio by reducing the returns of the benchmark ETF portfolio from the SRI ETF portfolio. The difference portfolio is improving the results as well as improving the comparability of the return patterns on the two portfolios. The difference portfolio is visible for the whole time period with the three different regressions: the CAPM, the three-factor model, and the four-factor model.

6.1.3 Descriptive statistics

Finally, Table 4 below summarizes the data. The table visualizes information for the 121 SRI equity ETFs. Full period refers to the entire examination period of January 2010 to December 2020. The time periods 1/2010, 1/2015, and 12/2020 represent nearly the beginning, middle, and end of the data sample period. Therefore, the numbers visualized demonstrate the amount of ETFs in existence during the time period shown. TNA of all ETFs refers to the Total Net Assets of the funds in billion U.S. dollars. For the early years, the TNA of all ETFs and the median total expense ratios were not available in the Refinitiv Datastream.

The table summarizes the SRI ETFs on the basis of their screening strategies (Inclusion or Exclusion) and the ESG attributes they are using in investment decision making. This categorizing method follows a similar pattern as in Nofsinger and Varma (2014). Any product-related screen refers to an exclusion screen where the ETF avoids certain products. These products can include alcohol, tobacco, gambling, weapons, pornography,

abortion, etc. Chapter 4 presents the idea of sin-stocks more thoroughly. Inclusion means the same as a positive screening or best-in-class approach that the ETF over-weights assets that do perform well with that certain ESG attribute. Vice versa, exclusion (negative screening) means that the ETF restricts assets that perform poorly in that certain ESG attribute.

An environment screen strategy focuses on climate, pollution, environmental sustainability, renewable energy and clean technologies, and clean water. Social screen strategy focuses on equality, diversity, racial or gender diversity in company boards, human rights, and community development. A governance screen strategy focuses on corporate governance issues like independence of directors, executive compensation, and how the company is managed. In the funds employing an ESG screen, the focus is on all of the three attributes mentioned above, or no distinguishing can be done between the three attributes.

SRI ETF summary items	Full Period	*% of Total*	1/2010	1/2015	12/2020	*% chg. 2010-2020*
# of all ETFs	121		24	31	108	*350 %*
# of unique ETF managers	41		8	13	35	*338 %*
Median ETF age			1	2	4	
TNA of all ETFs ($ in billions)			-	-	84,2	
Median total expense ratio			-	-	0,40 %	
Screening criteria						
SRI ETFs (Total):	121	*100 %*	24	31	108	*350 %*
Any Product related screen:	54	*45 %*	12	15	54	*350 %*
ESG screen:						
All (Inclusion or Exclusion)	48	*40 %*	3	4	48	*1500 %*
Inclusion	25	*21 %*	2	2	25	*1150 %*
Exclusion	23	*19 %*	1	2	23	*2200 %*
Environment screens:						
All (Inclusion or Exclusion)	27	*22 %*	13	17	27	*108 %*
Inclusion	22	*18 %*	12	15	22	*83 %*
Exclusion	5	*4 %*	1	2	5	*400 %*
Social screens:						
All (Inclusion or Exclusion)	21	*17 %*	2	2	21	*950 %*
Inclusion	8	*7 %*	1	1	8	*700 %*
Exclusion	13	*11 %*	1	1	13	*1200 %*
Governance screens:						
All (Inclusion or Exclusion)	12	*10 %*	2	2	12	*500 %*
Inclusion	10	*8 %*	1	1	10	*900 %*
Exclusion	2	*2 %*	1	1	2	*100 %*

Table 4. Summary statistics of the SRI ETFs.

As demonstrated in the theoretical part of this thesis, ETFs and social responsibility together are relatively new instruments in the financial markets. Sabbaghi (2011) studied 15 ETFs, Meziani (2014) studied 15 ETFs, and Chakrabarty et al. (2017) studied 11 ETFs while this study already has 121 ETFs with an SRI objective. The data used in this sample demonstrates the same dramatic increase in the number of available products. The SRI ETF sample grew from 24 to 108 during the sample period while the total sample is 121 meaning that there is 13 fund that was merged or liquidated. In addition, the data sample is in line with the previous since the ETFs are growing more in age and in numbers in the latter part of this 11 year period. As presented before, the increase in SRI and in

ETFs is increasing rapidly after the year 2016. This gives the motivation to examine the two subperiods of January 2015 to December 2020 and January 2019 to December 2020. The time periods will capture the effect of the SRI ETF industry growing and developing.

Notable is also the fees for SRI ETFs of 0.40%, which are significantly higher than the ones for benchmark ETFs with a median of 0.09%. This gives the reference that the SRI funds need compensation for the work that occurs from the screens in the ETFs and that the funds are not purely passive as to the counterpart, which follows the S&P500 index purely. This supports the need to evaluate alphas before and after fees to control the effect of the costs.

The summary statistics also present that 45% of the SRI ETFs use a product screen in investment decision making. ESG screen as a strategy has the fastest growth during the sample period and that results in the fact that the ESG screen presents the majority of the sample. The environmental screens is dominating the industry at the beginning of the sample, with 13 ETFs from the total 24 ETFs. The social screens represent the second-largest portion from the single ESG screens, while the governance screen presents the smallest sample through the sample period. Moreover, the data sample provides information that the ETF managers tend to use inclusion rather than exclusion in the investment decision-making process.

Further, Table 5 below demonstrates the descriptive statistics for the daily returns of each portfolio in the empirical part. SRI ETF portfolio is the total sample of 121 SRI ETFs, S&P500 ETF portfolio is from the four different S&P500 ETFs, and the difference portfolio is the difference between the two portfolios. Finally, the rest portfolios are the ones that are to examine the performance of different screening strategies and ESG attributes. All of the portfolios are equally weighted.

Portfolio	# of ETFs	Min	Max	Mean	Median	St.Dev	Kurtosis	Skewness
SRI ETF portfolio	121	-0,1064	0,0851	0,0003	0,0008	0,0120	8,4617	-0,6362
S&P500 ETF portfolio	4	-0,1148	0,0939	0,0005	0,0007	0,0108	15,5856	-0,6287
Difference portfolio	-	-0,1064	0,0851	0,0003	0,0008	0,0121	8,3149	-0,6189
Inclusion	67	-0,1088	0,0903	0,0003	0,0009	0,0124	8,4624	-0,6184
Exclusion	38	-0,1065	0,0837	0,0005	0,0009	0,0104	13,0473	-0,8018
Product Screen	54	-0,1072	0,0878	0,0005	0,0008	0,0104	13,8627	-0,7539
ESG Inclusion	25	-0,1084	0,0861	0,0004	0,0008	0,0099	16,3035	-0,9186
ESG Exclusion	23	-0,1041	0,0880	0,0005	0,0008	0,0103	13,5469	-0,7367
ENV Inclusion	22	-0,1103	0,0975	0,0004	0,0008	0,0130	8,8165	-0,6261
ENV Exclusion	5	-0,1094	0,0803	0,0004	0,0008	0,0102	12,9719	-0,7553
Social Inclusion	8	-0,1074	0,0897	0,0005	0,0008	0,0106	12,6835	-0,6569
Social Exclusion	13	-0,1070	0,0823	0,0004	0,0008	0,0105	12,7855	-0,7738
Gov Inclusion	10	-0,1036	0,0860	0,0005	0,0008	0,0104	12,9246	-0,6780
Gov Exclusion	2	-0,1078	0,0911	0,0005	0,0008	0,0104	13,3187	-0,7132

Table 5. Descriptive statistics.

On the basis of descriptive statistics, all of the portfolios are yielding positive returns during the full sample period. Mean and median returns are relatively close to each other. However, the statistics are from daily returns, so the effect widens in monthly or yearly observations. Environmental Inclusion strategy provides the highest daily return while the S&P500 ETF portfolio has the lowest daily return during the period. Environmental Inclusion also exhibits the highest volatility during the sample period.

Kurtosis for all of the portfolios is higher than 3. The portfolios are having heavier tails than a normal distribution, and therefore, the returns are indicating leptokurtic return series. Skewness is negative for all of the portfolios. This indicates that during the sample period, larger negative ETF returns are more common than the large positive ones. The

minimum and maximum values also demonstrate that the negative returns were higher than the positive returns.

6.2 Methodology

This chapter presents the econometric models. In addition, it will present the econometric variables.

6.2.1 Capital Asset Pricing Model - CAPM

After Markowitz (1952) introduced Modern Portfolio Theory, three academics, Sharpe (1964), Lintner (1965), and Mossin (1966), continued to study the relationship between risk and return. Twelve years after the Modern Portfolio Theory was published, the Capital Asset Pricing Model (CAPM) was introduced on the basis of individual works done by the three academics. The CAPM theory suggests that investors are only willing to take more risk if they are compensating by better returns. Therefore, the investors are profiting from the instruments' riskiness as well as the time value of money. The CAPM formula is as follows:

$$E(r) = r_f + \beta \left(r_m - r_f\right), \tag{3}$$

where $E(r)$ is the expected return on asset, r_f is the risk-free rate, β is the beta of the asset, and r_m is the expected return on the market. The formula calculates the expected return for asset i, which is the risk-free rate added to the asset risk premium. The risk-free rate demonstrates the time value of money function, while the asset beta demonstrates the riskiness of the asset towards the market risk or systematic risk. Therefore the systematic risk has a much bigger effect on the asset return than the unsystematic risk, which can be diversified (Sharpe, 1964; Lintner, 1965; Mossin, 1966).

The beta (β) of the asset is comparative to the market portfolio of assets. A beta value of 1.0 demonstrates that the asset is as volatile as the markets are and that the asset moves together with the market. A beta value under 1.0 demonstrates that the asset is less volatile than the market, while a beta value over 1.0 demonstrates that the asset is more volatile than the market. Therefore, the beta measures the relation of the asset to market portfolio risk. The following formula captures the assets' beta:

$$\beta = \frac{Cov(r_i, r_m)}{\sigma_M^2}, \quad (4)$$

where $Cov(r_i, r_m)$ is the covariance between returns of the asset with the market portfolio and σ_M^2 is the variance of the market portfolio (Bodie et al., 2014).

The CAPM is a fundamental empirical model to test performance and it is efficient in understanding the financial markets due to its simplicity. However, the CAPM relies on assumptions that are necessary for academic testing, but the model ignores many of real-world implications due to these assumptions. The model assumes that all of the market participants as investors have identical investment period, all participants act in a rational way, all investors are price takers, there are no taxes nor transaction costs on investing, all investors are limited to publicly traded assets, and that investors can borrow and lend at the same risk-free rate. Therefore, they use Markowitz (1952) Modern Portfolio Theory to seek mean-variance optimal portfolios (Bodie et al., 2014, p. 303).

6.2.2 Fama and French three-factor model

While the CAPM model captures the market risk or systematic risk, the Fama-French three-factor model expands the CAPM with company characteristics as proxies. While the CAPM is a single factor model, the Fama and French model has three factors and therefore has empirically proven to have more explanatory power. The model is developed by Eugene Fama and Kenneth French in 1996 based on the CAPM. The model

and the authors can be considered as one of the biggest pioneers in the empirical analysis of asset prices as Fama was awarded a Nobel prize in 2013. They continue the asset pricing model to account for the company size factor and book-to-market ratio as value factors because of prior evidence of their explanatory power in asset pricing. The Fama-French three-factor model explains the expected return of the asset (Fama and French, 1996). The formula is as follows:

$$R_{it} - R_{Ft} = \alpha_i + b_i(R_{Mt} - R_{Ft}) + s_i SMB_t + h_i HML_t + e_{it}, \quad (5)$$

where R_{it} is the return on a portfolio i, R_{Ft} is the risk-free rate, $R_{it} - R_{Ft}$ is the excess return on the portfolio, α_i is the abnormal return, $R_{Mt} - R_{Ft}$ is the excess return on a market portfolio, SMB_t is the size factor premium, HML_t is the value factor premium, and b_i, s_i, h_i are the factor coefficients. The size factor demonstrates the difference in returns between a portfolio of small stocks and a portfolio of large stocks, measured in market capitalization. The value factor demonstrates the difference in returns between a portfolio of high book-to-market stocks and a portfolio of low book-to-market stocks. (Fama and French, 1996).

The model assumes that companies with small capitalization and companies with high book-to-market ratios outperform the markets consistently. Fama and French (1993) demonstrate that small-capitalization stocks tend to overperform large-capitalization stocks, and similarly, that value companies with high book-to-market ratios tend to overperform companies with low book-to-market ratios. However, there is debate if the overperformance is due to market efficiency or inefficiency presented in the second chapter. In favor of the market efficiency, the overperformance is explaining the higher risk that small capitalization and high book-to-market carry in terms of capital cost. Then again in favor of the inefficient markets, the market participants are pricing the value of these companies incorrectly, and some can benefit from the mispricing's when the prices do adjust in the long run (Bodie et al., 2014).

Kothari, Shanken, and Sloan (1995) demonstrate that the average returns on high book-to-market are actually weaker than what Fama and French (1996) state. The authors argue that the data includes firms that survive and miss firms that fail. Therefore, the data would foster high book-to-market returns. In addition, Kothari et al. (1995) demonstrate that the systematic risk is not explaining the returns, and the beta has no explanatory power in the Fama and French three-factor model.

6.2.3 Carhart four-factor model

The Fama and French three-factor model is maybe the most widely used factor asset pricing model in finance. As a result, the model has been expanded and modified with different factors. Jegadeesh and Titman (1993) demonstrate that the one-year momentum anomaly is explaining the asset prices. The results imply that previous twelve-month returns are continuing for the upcoming months. In other words, if a stock has had good returns for the last twelve months, it is likely to keep performing well in the future, and vice versa, if a stock has had lower returns for the last twelve months, they tend to stay lower for the upcoming months. Therefore, the CAPM and Fama and French three-factor models are not explaining the continuation of the asset returns, which the momentum anomaly demonstrates to exists. As a result, Carhart (1997) expands the Fama and French three-factor model to account for the momentum factor. The Carhart four-factor model formula is as follows:

$$R_{it} - R_{Ft} = \alpha_i + b_i(R_{Mt} - R_{Ft}) + s_i SMB_t + h_i HML_t + p_i WML_t + e_{it}, \quad (6)$$

where the WML_t is the one-year momentum factor, p_i is the factor coefficient, and the remaining variables are the same as in Fama and French three-factor model (Equation 5). The one-year momentum factor (WML) demonstrates the difference in excess returns of the last twelve-month stock gainers and loser stock portfolios. In his study, Carhart shows that the one-year momentum factor explains the abnormal returns of mutual fund portfolios.

Fama and French (2015) still expands the four-factor model to account for the difference in returns of firms with low investments (conservative investments) and returns of firms with high investments (aggressive investments). Fama and French note that all of the asset pricing factor models presents a similar feature on the regressing results. When the model is efficiently explaining the returns, the intercept is close to zero. Therefore, the model is working well and explain the expected returns when the intercept is close to zero (Fama and French, 2015).

6.2.4 Jensen alpha

Jensen's alpha or Jensen measure was introduced in 1968 by Micheal C. Jensen to measure a portfolio manager's ability to create the abnormal return. The alpha of an investment is the average return on a portfolio that is above or below the returns that a pricing model like the CAPM predicts. Therefore, the Jensen alpha is the alpha of the portfolio, given the portfolio's beta and average market return. When an investment has positive alpha, the investment returns are higher than an asset pricing model predicts. Also, in Jensen alpha, the riskier the investment is, the more it should generate returns (Jensen, 1968). The formula for Jensen alpha is as follows:

$$\alpha_p = \bar{R}_p - [\bar{R}_f + \beta_p(\bar{R}_M - \bar{R}_f)] \quad (7)$$

where α_p is the alpha of the investment, $\bar{R}_p$ is the realized return of the investment, $\bar{R}_f$ is the risk-free rate, β_p is the beta of the investment, and $\bar{R}_M$ is the return of the benchmark market index (Jensen, 1968).

6.2.5 The econometric variables

The previous chapter presents the econometric models, while this chapter will explain the formation of the different variables and what is their purpose for this thesis.

The excess return $R_{(e)}$ of the SRI ETF is the dependent variable since the research is focusing on their performance. The excess return of the SRI ETFs is derives from the excess return over the risk-free rate $R_{(Ft)}$. The risk-free rate is the one-month U.S. Treasury bill yield since the research focuses on U.S. equity ETFs. The U.S. Treasury bill yield serves as the closest proxy and is maybe the most commonly used risk-free rate in academic research. The explanatory variables are as done in the research by Fama and French (1996) and Carhart (1997). The explanatory variables are the market factor (beta coefficient), risks such as the size factor (SMB), value factor (HML), and the momentum factor (MOM).

All of the empirical models in this thesis include the same beta coefficient β and the market premium $R_{(m)}$, which is the market return in excess of the risk-free rate. The market return variable accounts for all Central for Research in Security Prices (CRSP) companies that are in the U.S. and are in exchanges such as NYSE, AMEX, or NASDAQ in value-weighted terms. These variables are in the CAPM model. The Fama and French three-factor model includes the size factor (SMB) and the value factor (HML). Further, the Carhart four-factor model adds the momentum factor (MOM). All of the factors and variables are from the Kenneth R. French database on a daily basis and are in U.S. dollars (French, 2021).

The size factor (SMB) is from the returns of companies with different market capitalization. Market capitalization is the share price of the company multiplied by the number of shares outstanding. The size factor derives from the difference between small-capitalization companies' returns and big market capitalization companies in value-weighted terms (French, 2021). The SMB factor in the French database takes the following form:

$$SMB = \frac{1}{3}(Small\ Value + Small\ Neutral + Small\ Growth)\ - \frac{1}{3}\ (Big\ Value + Big\ Neutral + Big\ Growth) \quad (8)$$

The value factor (HML) is from the return difference of high book-to-market ratio companies and low book-to-market ratio companies. The book-to-market ratio derives from the ratio of the book value of stocks in a company towards the market value of those stocks. Therefore, the value factor derives from the return difference of two value portfolios and two growth portfolios in value-weighted terms (French, 2021). The HML factor in French database takes the following form:

$$HML = \frac{1}{2}(Small\ Value + Big\ Value) - \frac{1}{2}\ (Small\ Growth + \ Big\ Growth) \quad (9)$$

Finally, the last explanatory variable is the momentum factor (MOM) which is the difference between two portfolios with high prior return and two portfolios of low prior return. The returns of companies are from the past 11 months lagging with the nearest one month from where the name 1-year momentum effect is from. Then, the returns of the highest performing 30% are subtracted from the returns of the lowest-performing 30% (French, 2021). The MOM factor in the French database takes the following form:

$$MOM = \frac{1}{2}(Small\ High + Big\ High) - \frac{1}{2}\ (Small\ Low + \ Big\ Low) \quad (10)$$

7 Empirical analysis and results

This chapter will present the results from the empirical models and data introduced in the last chapter. Firstly, the chapter presents how the passive SRI ETFs perform against the benchmark group on the different empirical models and time periods. Lastly, the chapter presents results from the different screening strategies and the ESG attributes in the ETFs investment decision making to see which are the attributes driving the results. In addition, the sensitivities to the risk factors are visible under each chapter. However, only the chapter of the four-factor model will discuss the sensitivities since they are so similar in each model. The regression results are shown for the three different time periods to capture the growing market significance of the SRI ETFs during the latter part of the sample period.

7.1 Results from the CAPM

First, the thesis discusses the results from CAPM. The results are visible for both the sustainable SRI ETF portfolio and the benchmark ETF portfolio. Similar to Nofsinger and Varma (2014), this thesis calculates an additional difference portfolio. The difference portfolio is to further improve the results and their comparability. This is to check if the performance in the difference portfolio is statistically different. Table 6 below presents the results from the CAPM. All alphas are annualized for presentation purposes and expressed as percent as done in other similar studies. The stars next to the numbers illustrate the significance level as follows: *** significant at 1% level, ** significant at 5% level, * significant at 10% level. The significance levels are visible similarly in all the result tables in this study. The t-ratios are in the brackets below the alphas.

Portfolio	**Full Period**	**Half Period**	**Last 2 Years**
Time period	1/2010 - 12/2020	1/2015 - 12/2020	1/2019 - 12/2020
# of SRI ETFs	121	115	114
SRI ETF Portfolio	**-7,90*** **	**-0,52**	**2,99**
	-[3,61]	*-[0,22]*	*[0,84]*
S&P500 ETF Portfolio	**-1,81** **	**-2,42*** **	**-3,54** **
	-[2,49]	*-[3,06]*	*-[2,39]*
Difference Portfolio	**-7,35*** **	**0,45**	**4,49**
	-[3,26]	*[0,17]*	*[0,97]*

Table 6. Regression results from the CAPM.

As the results imply, the SRI ETF portfolio and the benchmark portfolio both show statistically significant negative alpha for the full sample period of 11 years. The SRI ETFs show an annual alpha of -7.90%, while the benchmark group has -1.81% annual alpha. The SRI ETFs alpha is statistically significant at a 1% level, while the benchmark portfolio is statistically significant at a 5% level. Therefore, the CAPM suggests that the benchmark group of passive S&P 500 ETFs is outperforming the SRI ETF group significantly and yielding much higher returns (less negative alpha) on the full sample period. Similarly, the difference group implies negative returns in a statistically significant manner. These results are similar to Meziani (2014), who provides evidence that the SRI ETFs are not performing as well as their benchmark index prior to 2015.

However, narrowing down the sample period to the last six years the SRI ETF portfolio is outperforming the benchmark. Yet, the SRI ETF portfolio loses significance. The period from the beginning of 2015 to the end of 2020 demonstrates the time period when the SRI ETFs are growing more in numbers and in asset size. Furthermore, the last two years demonstrate that the difference is growing, and the SRI ETF portfolio is outperforming even more. The SRI ETF portfolio is yielding 2.99% annual alpha while the S&P500 ETF portfolio is yielding -3.54% annual alpha. Again, these results are not significant for the SRI ETF portfolio.

To conclude the CAPM, the results suggest accepting the first hypothesis since the S&P500 ETF portfolio is not overperforming the SRI ETF portfolio consistently. The SRI ETF portfolio does overperform on the latter part of the examination period. Further, narrowing down the sample to the last two years, the SRI ETF portfolio is overperforming the index in a huge manner. However, the results are not significant for the two last time periods, and the results favor the S&P 500 ETF portfolio that does no screening for SRI in the first time period where the results were statistically significant. The SRI ETF showing an annual alpha of -7.90% compared to the S&P500 ETF benchmark group's annual alpha of -1.81%.

Table 7 presents the full regression results from the CAPM regression for the full sample period. The four-factor model chapter is the only one discussing the factor loadings since they are similar in all of the models.

Portfolio	Alpha	Beta	R2	Std. Error
Sustainable Portfolio	**-7,90*** **	**0,99*** **	**0,925**	**0,005**
	-[3,61]	*[128,11]*		
Benchmark Portfolio	**-1,81** **	**0,95*** **	**0,990**	**0,002**
	-[2,49]	*[369,67]*		
Difference Portfolio	**-7,35*** **	**0,99*** **	**0,921**	**0,005**
	-[3,26]	*[124,14]*		

Table 7. The CAPM factor loadings for the full sample period.

7.2 Results from the three-factor model

Secondly, the chapter shows the alphas from the Fama and French three-factor model. The results are visible for both the sustainable SRI ETF portfolio and the benchmark ETF portfolio. Similar to Nofsinger and Varma (2014), this thesis calculates an additional

difference portfolio. The difference portfolio is to further improve the results and their comparability. This is to check if the performance in the difference portfolio is statistically different. Table 8 below presents the results from the three-factor model. All alphas are annualized for presentation purposes and expressed as percent as done in other similar studies. The stars next to the numbers illustrate the significance level as follows: *** significant at 1% level, ** significant at 5% level, * significant at 10% level. The significance levels are visible similarly in all the result tables in this study. The t-ratios are in the brackets below the alphas.

Portfolio	**Full Period**	**Half Period**	**Last 2 Years**
Time period	1/2010 - 12/2020	1/2015 - 12/2020	1/2019 - 12/2020
# of SRI ETFs	121	115	114
SRI ETF Portfolio	**-7,02*** **	**0,52**	**4,84**
	-[3,34]	*[0,23]*	*[1,55]*
S&P500 ETF Portfolio	**-1,85*** **	**-2,28*** **	**-2,40** **
	-[2,87]	*-[3,48]*	*-[2,24]*
Difference Portfolio	**-6,54*** **	**1,34**	**5,87**
	-[3,01]	*[0,54]*	*[1,32]*

Table 8. Regression results from the three-factor model.

To note, the three-factor model offers similar results to the CAPM. The SRI ETF portfolio is losing to the benchmark portfolio of passive S&P500 ETFs in a statistically significant manner only in the full sample period. The SRI ETF sample has an annual alpha of -7.02%, which is lower than the one in CAPM (-7.90%), while both being statistically significant at a 1% level. The benchmark portfolio shows a negative annual alpha of -1.85% also in a statistically significant manner. Further, the difference portfolio is also statistically significant with an annual alpha of -6.54%. These results are similar to Meziani (2014), who provides evidence that the SRI ETFs are not performing as well as their benchmark index prior to 2015.

Again, narrowing down the sample period to the last six years (Half period), the SRI ETFs start to overperform the S&P500 ETF portfolio but not in a statistically significant manner. The SRI ETF portfolio is yielding 0.52% annual alpha while the S&P500 ETF portfolio is yielding -2.38% negative alpha. Only the S&P500 ETF portfolio is demonstrating statistically significant values at the 1 % level. Finally, the last two-year period shows again that the difference is growing between the two sample groups. The SRI ETF portfolio is yielding 4.84% annual alpha while the benchmark yields -2.40% annual alpha. The difference portfolio alpha grows to 5.87%. However, the results point out that the SRI ETF portfolio and the difference portfolio lose their significance for the two last time periods. The S&P500 ETF portfolio is now statistically significant at a 5% level.

To conclude, the full-time period favors the S&P500 ETF portfolio that does no screening for SRI. The SRI ETF showing an annual alpha of -7.02% compared to the S&P500 ETF benchmark group's annual alpha of -1.85%. However, the results are not consistent throughout the time periods since the SRI ETFs start to overperform on the two last time periods. However, they are not overperforming in a statistically significant manner. To conclude the three-factor model, the results suggest accepting the first hypothesis since the alphas between the two counterparts are not consistent between the time periods in a statistically significant manner, and the SRI ETF portfolio shows that they can generate better returns.

Table 9 presents the full regression results from the three-factor model regression for the full sample period. The four-factor model chapter is the only one discussing the factor loadings since they are similar in all of the models.

Portfolio	Alpha	Beta	SMB	HML	R2	Std. Error
Sustainable Portfolio	**-7,02*** **	**0,95*** **	**0,21*** **	**0,10*** **	**0,932**	**0,004**
	-[3,34]	*[122,61]*	*[13,54]*	*[8,21]*		
Benchmark Portfolio	**-1,85*** **	**0,96*** **	**-0,13*** **	**0,01*** **	**0,992**	**0,001**
	-[2,87]	*[404,52]*	*-[27,72]*	*[3,16]*		
Difference Portfolio	**-6,54*** **	**0,95*** **	**0,20*** **	**0,09*** **	**0,927**	**0,005**
	-[3,01]	*[118,29]*	*[12,86]*	*[7,05]*		

Table 9. The three-factor model factor loadings for the full sample period.

7.3 Results from the four-factor model

Thirdly, the chapter shows the results from the Carhart four-factor model for both the sustainable SRI ETF portfolio, and the benchmark ETF portfolio. This is the main model of this thesis. Therefore, the chapter discusses the sensitivity factors in its own subchapter.

Similar to Nofsinger and Varma (2014), this thesis calculates an additional difference portfolio. The difference portfolio is to further improve the results and their comparability. This is to check if the performance in the difference portfolio is statistically different. Table 10 below presents the results from the four-factor model. All alphas are annualized for presentation purposes and expressed as percent as done in other similar studies. The stars next to the numbers illustrate the significance level as follows: *** significant at 1% level, ** significant at 5% level, * significant at 10% level. The significance levels are visible similarly in all the result tables in this study. The t-ratios are in the brackets below the alphas.

Portfolio	Full Period	Half Period	Last 2 Years
Time period	1/2010 - 12/2020	1/2015 - 12/2020	1/2019 - 12/2020
# of SRI ETFs	121	115	114
SRI ETF Portfolio	**-7,06*** **	**0,08**	**5,33***
	-[3,37]	*[0,03]*	*[1,70]*
S&P500 ETF Portfolio	**-1,86*** **	**-2,32*** **	**-2,60** **
	-[2,90]	*-[3,55]*	*-[2,42]*
Difference Portfolio	**-6,58*** **	**0,95**	**6,74**
	-[3,03]	*[0,38]*	*[1,51]*

Table 10. Regression results from the four-factor model.

The four-factor model offers similar results to the CAPM and Fama and French three-factor model. The SRI ETF portfolio is losing to the benchmark portfolio of passive S&P500 ETFs in a statistically significant manner in the full sample period. The SRI ETF sample has an annual alpha of -7.06%, which is similar to the one in the three-factor model (-7.02%), while both being statistically significant at a 1% level. The benchmark portfolio shows a negative annual alpha of -1.86% also in a statistically significant manner. These results are similar to Meziani (2014), who provides evidence that the SRI ETFs are not performing as well as their benchmark index prior to 2015.

Again, the latter part of the study shows that the SRI ETFs start to overperform the benchmark index of passive S&P500 ETFs. In the second time period, the SRI ETFs generate 0.08% annual alpha while the benchmark portfolio generates -2.32% annual alpha, yet again so that the SRI ETF portfolio loses its statistical significance and the benchmark group staying significant at a 1% level. Finally, the final two years demonstrate again overperformance of the SRI ETFs with an annual alpha of 5.33%. Now the result is significant at a 10% level while the benchmark group stays significant at a 5% level. The difference portfolio increases to 6.74% annual alpha, which demonstrates that there is a huge difference in the returns but not in a statistically significant manner.

To conclude the four-factor model alphas, the results suggest accepting the first hypothesis since the alphas between the counterparts are consistently different. The SRI ETF portfolio is therefore not losing consistently to the S&P500 ETF portfolio. However, the results favor the S&P 500 ETFs group that does no screening for SRI in the full sample period. The SRI ETFs showing an annual alpha of -7.06% compared to the S&P500 ETF benchmark group's annual alpha of -1.86%. Yet again, the two final sample periods are favoring the SRI ETF portfolio. The two last year's show again a huge return difference between the two portfolios and now in a significant manner (10% level). These results are consistent with the three different empirical models.

7.3.1 Factor loadings on the four-factor model

Table 11 below presents the results from the four-factor model for the full sample period. This table presents the factor loadings of the model and summarizes the other factor loadings from the CAPM and the three-factor model. All alphas are annualized for presentation purposes and expressed as percent as done in other similar studies. The stars next to the numbers illustrate the significance level as follows: *** significant at 1% level, ** significant at 5% level, * significant at 10% level. The significance levels are similar in all the result tables in this thesis. The t-ratios are in the brackets below the corresponding sensitivity factor. The R2 measures the models' explanatory power and therefore represents the model's goodness of fit. Finally, the standard error presents the precision of the estimate of the coefficient and therefore demonstrates the precision of the alpha.

Portfolio	Alpha	Beta	SMB	HML	MOM	R2	Std. Error
Sustainable Portfolio	**-7,06*** **	**0,95*** **	**0,20*** **	**0,07*** **	**-0,0004** **	**0,932**	**0,004**
	-[3,37]	*[122,46]*	*[12,98]*	*[4,53]*	*-[3,31]*		
Benchmark Portfolio	**-1,86*** **	**0,96*** **	**-0,13*** **	**0,005**	**-0,0001** **	**0,992**	**0,001**
	-[2,90]	*[402,79]*	*-[27,84]*	*[0,95]*	*-[2,57]*		
Difference Portfolio	**-6,58*** **	**0,95*** **	**0,20*** **	**0,06*** **	**-0,0003*** **	**0,927**	**0,005**
	-[3,03]	*[118,00]*	*[12,39]*	*[4,01]*	*-[2,64]*		

Table 11. The four-factor model factor loadings for the full sample period.

The model goodness implies that the empirical model is working relatively well in addition to the small standard errors of the models. The R2 implies that the four-factor model has good explanatory power. The benchmark portfolio has the best R2 with 0.992, while the SRI ETF portfolio has an R2 of 0.932. The results and the explanatory powers are similar to other studies where the market portfolio (S&P500) has higher explanatory values than the SRI ETF portfolio. The R2 is the best in the four-factor model when comparing to the CAPM and three-factor model. Therefore, the size, value, and momentum factors are improving the results. The beta coefficients are statistically significant and relatively close to each other (0.95 and 0.96), signifying that the SRI ETFs and the benchmark returns move in the same direction as the market but are a bit more defensive.

The size factor (SMB) is positive for the SRI ETF group and the difference portfolio. However, the benchmark group gives distinctive results where the size factor is negative -0.13%. Thus, implying that different effects can be presumed whether the ETFs are socially sustainable or not. The size factor for all the portfolios is statistically significant in a 1% level. The Fama and French (1996) study expect that the size factor is positive and that big market capitalization stocks yield lower returns than smaller market capitalization stocks. Therefore, the S&P500 ETF portfolio has distinctive results as the model assumes.

The value factor (HML) is positive for all of the portfolios. Fama and French (1996) study indicates that this is the assumed relation, and therefore, these results are in line with the expectations. Nonetheless, the value factor loses its significance for the benchmark portfolio while the SRI ETF group still achieved significant results on a 1% level.

The momentum factor (MOM) is negative for all of the portfolios. The significance level is 5% for both the SRI ETF portfolio and for the S&P500 ETF portfolio. The difference portfolio is achieving statistically significant values at a 1% level. These results are not in line with the Carhart (1997) study, where the momentum should have a positive effect on the returns. However, the results are really close to zero. For the SRI ETF portfolio, the factor is -0.0004%, while the benchmark portfolio has a value of -0.0001%.

7.4 Results in performance after controlling for fees

The results now visualize the alphas with the Carhart four-factor model for both the sustainable SRI ETF portfolio and the benchmark ETF portfolio after controlling for the fees of both groups. Thereon, this chapter discusses the effect of the fees between the two groups.

As discussed in the second chapter, the funds incur costs, and these costs affect the investment returns considerably. Additionally, the passive SRI ETFs have higher costs due to their screening strategies and strict principles in the investment decision-making process. The median expense ratio for the SRI ETF group was 0.40%, while the benchmark group only had a median expense ratio of 0.09%. Therefore, the SRI screening incurs costs significantly more than the passive counterpart that does no screening, and therefore, the fee characteristics are important to control.

Similar to Nofsinger and Varma (2014), this thesis calculates an additional difference portfolio. The difference portfolio is to further improve the results and their comparability. This is to check if the performance in the difference portfolio is statistically

different. Table 12 below presents the results from the four-factor model after controlling for the ETF fees. All alphas are annualized for presentation purposes and expressed as percent as done in other similar studies. The stars next to the numbers illustrate the significance level as follows: *** significant at 1% level, ** significant at 5% level, * significant at 10% level. The significance levels are similarly in all the result tables in this thesis. The t-ratios are in the brackets below the corresponding sensitivity factor.

Portfolio	**Full Period**	**Half Period**	**Last 2 Years**
Time period	1/2010 - 12/2020	1/2015 - 12/2020	1/2019 - 12/2020
# of SRI ETFs	121	115	114
SRI ETF Portfolio	**-6,66*** **	**0,48**	**5,73***
	-[3,18]	*[0,21]*	*[1,82]*
S&P500 ETF Portfolio	**-1,77*** **	**-2,23*** **	**-2,51** **
	-[2,76]	*-[3,41]*	*-[2,33]*
Difference Portfolio	**-4,89*** **	**2,71**	**8,25** **
	-[2,29]	*[1,20]*	*[2,48]*

Table 12. Regression results with the four-factor model after controlling for the fees.

Again, the SRI ETF portfolio loses to the benchmark portfolio of passive S&P500 ETFs in a statistically significant manner only in the full sample period. The SRI ETF sample has an annual alpha of -6.66% after controlling for the fees, while before fees, the alpha was 7.06% when calculated with the four-factor model. The benchmark portfolio shows a negative annual alpha of -1.77% also in a statistically significant manner. After controlling the fees, the SRI ETF portfolio still loses to its counterpart, but the difference narrows down due to the higher fees in the SRI ETF portfolio. The difference narrows down to -4.89%, while without controlling the fees, the difference was -6.58%.

Similarly, the second and the final time period favors the SRI ETF portfolio, where it overperforms the benchmark portfolio. The difference portfolio annual alpha increases to 8.25% and stays statistically significant at a 5% level. The SRI ETF portfolio is yielding annually 5.73% alpha, while the benchmark ETF portfolio is yielding a -2.51% annual

alpha. Further, the SRI ETF portfolio is significant at a 10% level, and the benchmark portfolio is significant at a 5% level.

Like the data demonstrates, the fees are higher for the SRI ETF portfolios, which do screening and therefore incur costs. The passive S&P500 ETF portfolios do no screening and have, therefore, lower fees. The alphas demonstrate that the fees are worth paying at least on the two final study periods where the SRI ETFs are outperforming the counterpart.

7.5 Results from the screening strategies and ESG attributes

So far, the performance analysis has analyzed SRI ETFs as a homogeneous group. However, the different screening strategies of the SRI ETFs may perform differently. Now, this thesis will separate the SRI ETF data sample shown in the descriptive statistics. The reason is to examine what are the strategies (inclusion or exclusion) and attributes (ESG and product-related) that drive the results in the SRI ETF sample. All of the portfolios are equally weighted from the ETFs incorporating a similar strategy.

Any product-related screen refers to an exclusion screen where the ETF avoids certain products. These products can include alcohol, tobacco, gambling, weapons, pornography, abortion, etc., considered as a sin stock referred to earlier in chapter 4. Inclusion means the same as a positive screening or best-in-class approach that the ETF over-weights assets that do perform well with that certain ESG attribute. Vice versa, exclusion means that the ETF restricts assets that perform poorly in that certain ESG attribute. An environment screen strategy focuses on the impact on climate, pollution, environmental sustainability, renewable energy and clean technologies, and clean water. Social screen strategy focuses on equality, diversity, racial or gender diversity in company boards, human rights, and community development. Governance screen strategy focuses on corporate governance issues like independence of directors, executive compensation, and how the company is managed. In the funds employing an ESG screen, the focus is

on all of the three attributes mentioned above, or no distinguishing can be done between the three attributes.

All alphas are annualized for presentation purposes and expressed as percent as done in other similar studies. The stars next to the numbers illustrate the significance level as follows: *** significant at 1% level, ** significant at 5% level, * significant at 10% level. The significance levels are reported similarly in all the result tables in this thesis. The t-ratios are in the brackets below the corresponding sensitivity factor.

Portfolio	# of ETFs	Full Period 1/2010 - 12/2020	Half Period 1/2015 - 12/2020	Last 2 Years 1/2019 - 12/2020
Inclusion	**67**	**-6,31*** **	**0,35**	**7,81** **
		-[3,01]	*[0,15]*	*[2,42]*
Exclusion	**38**	**-0,30**	**0,66**	**0,43**
		-[0,20]	*[0,32]*	*[0,15]*
Product Screen	**54**	**-1,56**	**-1,33**	**-2,12**
		-[1,28]	*-[0,94]*	*-[0,80]*
ESG Inclusion	**25**	**-1,57**	**-2,45**	**-2,12**
		-[1,09]	*-[1,28]*	*-[0,80]*
ESG Exclusion	**23**	**-1,10**	**-0,66**	**0,74**
		-[0,73]	*-[0,31]*	*[0,30]*
ENV Inclusion	**22**	**-5,61** **	**3,46**	**13,80*** **
		-[2,20]	*[1,10]*	*[3,63]*
ENV Exclusion	**5**	**-2,23**	**-2,63**	**-1,88**
		-[1,54]	*-[1,31]*	*-[0,60]*
Social Inclusion	**8**	**-1,77**	**-1,55**	**-0,80**
		-[1,36]	*-[0,95]*	*-[0,33]*
Social Exclusion	**13**	**-2,04**	**-2,28**	**-0,22**
		-[1,38]	*-[1,11]*	*-[0,07]*
Gov Inclusion	**10**	**-1,37**	**-0,97**	**-0,27**
		-[1,02]	*-[0,56]*	*-[0,12]*
Gov Exclusion	**2**	**-1,90**	**-1,84**	**-1,25**
		-[1,48]	*-[1,16]*	*-[0,40]*

Table 13. Regression results for the different screening criteria and ESG attributes.

All of the strategies show negative alphas over the full sample period. The ETFs that incorporate the ESG Exclusion strategy with an annual alpha of -1.10% have the best return (less negative alpha). The second-best returns have the ETFs that incorporate the Governance Inclusion strategy with an annual alpha of -1.37%. The environmental category shows the weakest performance with Environmental Inclusion annual alpha of -5.61% and Environmental Exclusion annual alpha of -2.23%. However, the alphas lose their significance when dividing the SRI ETF sample group. Only Environmental Inclusion shows a statistically significant value at a 5% level. This might be due to the small sample group of SRI ETFs. Correspondingly, Nofsinger and Varma (2014) have similar returns, where they also lose the significance of the alphas when dividing the sample group into different categories. For example, the ETFs using Governance Exclusion in their investment decision-making consist of only two funds during the sample period.

As shown previously, the returns from the socially responsible ETFs start to turn positive in the latter part of the sample period. It is also the time period when most of the ETFs start to emerge, and both the SRI and ETFs independently are gaining significant market status. In the last six year period, from January 2015 to December 2020, the Inclusion and Exclusion groups turn positive with annual alphas correspondingly 0.35 and 0.66. In addition, the Environmental Inclusion screening strategy shows annual alpha of 3.46%, which is the highest of the sample group. However, in the six-year period, there are no statistically significant alphas.

Finally, in the last two-year period of the sample, there is significant overperformance by the Environmental Inclusion screening strategy. The strategy is yielding 13.80% annual alpha and clearly driving the results. The alpha is also statistically significant at a 1% level. This screening category also reflects to the Inclusion category, which demonstrates an annual alpha of 7.81% and statistically significant at a 5% level. These results are similar to Kempf and Osthoff (2007), who demonstrate overperformance for firms with good environmental attributes. They find that this best-in-class screening with a high socially responsible rating and selling stocks with low socially responsible ratings leads up to 8.7%

abnormal returns per year. The abnormal returns remain significant even after taking into account the reasonable transaction costs incurred when buying stocks (Kempf and Osthoff, 2007).

The results from the performance evaluation of the different strategies (Inclusion or Exclusion) and attributes (ESG and product-related) that drive the results clearly state that there are some differences among the different categories. The data set used in this thesis provides evidence that the ETFs that use Environmental Inclusion as a screening strategy can exhibit significant abnormal returns. The second hypothesis can be accepted since the results are different between the categories, and the Environmental Inclusion as a screening strategy yields significantly better alpha than the other categories. It is the only one that is a statistically significant result. The other categories are demonstrating different returns, and all not in a statistically significant manner.

Table 14 presents the factor loadings for all of the different portfolios from this part of the chapter. It is only for visualization purposes and this part will not get into detail with them.

Portfolio	# of ETFs	Alpha	Beta	SMB	HML	MOM	R2	Std. Error
Inclusion	**67**	**-6,31*** **	**0,99*** **	**0,23*** **	**0,07*** **	**0,00** **	**0,936**	**0,004**
		-[3,01]	*[126,78]*	*[14,70]*	*[4,51]*	*-[2,37]*		
Exclusion	**38**	**-0,30**	**0,88*** **	**0,03*** **	**0,03*** **	**0,00*** **	**0,956**	**0,003**
		-[0,20]	*[160,13]*	*[3,06]*	*[3,04]*	*-[2,94]*		
Product Screen	**54**	**-1,56**	**0,89*** **	**0,00**	**0,02** **	**-0,0002*** **	**0,969**	**0,003**
		-[1,28]	*[195,73]*	*-[0,27]*	*[2,23]*	*-[3,51]*		
ESG Inclusion	**25**	**-1,57**	**0,84*** **	**-0,01*** **	**0,04*** **	**-0,0003*** **	**0,954**	**0,003**
		-[1,09]	*[156,64]*	*-[0,85]*	*[3,85]*	*-[3,54]*		
ESG Exclusion	**23**	**-1,10**	**0,87*** **	**0,03** **	**0,03*** **	**-0,0003*** **	**0,953**	**0,003**
		-[0,73]	*[154,35]*	*[2,55]*	*[2,71]*	*-[3,17]*		
ENV Inclusion	**22**	**-5,61** **	**0,99*** **	**0,33*** **	**0,12*** **	**-0,0001**	**0,913**	**0,005**
		-[2,20]	*[104,30]*	*[17,48]*	*[6,26]*	*-[0,43]*		
ENV Exclusion	**5**	**-2,23**	**0,88*** **	**-0,03*** **	**-0,01**	**-0,0001**	**0,956**	**0,003**
		-[1,54]	*[162,65]*	*-[3,12]*	*-[0,96]*	*-[1,46]*		
Social Inclusion	**8**	**-1,77**	**0,91*** **	**-0,03*** **	**0,04*** **	**-0,0003*** **	**0,967**	**0,003**
		-[1,36]	*[187,57]*	*-[3,10]*	*[3,77]*	*-[4,49]*		
Social Exclusion	**13**	**-2,04**	**0,88*** **	**0,04*** **	**0,04*** **	**-0,0003*** **	**0,957**	**0,003**
		-[1,38]	*[161,40]*	*[3,47]*	*[3,45]*	*-[3,80]*		
Gov Inclusion	**10**	**-1,37**	**0,89*** **	**-0,04*** **	**0,02** **	**-0,0003*** **	**0,963**	**0,003**
		-[1,02]	*[177,85]*	*-[3,75]*	*[2,40]*	*-[3,61]*		
Gov Exclusion	**2**	**-1,90**	**0,90*** **	**-0,03*** **	**0,00**	**-0,0001***	**0,967**	**0,003**
		-[1,48]	*[188,99]*	*-[3,38]*	*-[0,04]*	*-[1,86]*		

Table 14. Factor loadings for all of the different screening strategies**.**

8 Discussion and conclusions

This thesis combines passive asset management with exchange-traded funds (ETFs) to socially responsible investing (SRI) as they both are current hot trends in the financial markets. Mutually exclusive, both the ETFs and SRI are gaining market significance in asset size. This thesis examines the two trends as a combined investment vehicle. This part of the thesis will discuss the results from the empirical part and link them to the theoretical part. It will provide answers to whether the socially responsible ETFs perform consistently and can these investment vehicles generate alpha for the investors over the passive counterpart. Furthermore, it will provide answers that what are the strategies (Inclusion or Exclusion) and attributes (ESG and product-related) that were driving the results.

The empirical part investigates if the SRI ETFs generate better alpha consistently over the passive counterpart consisting of the S&P500 ETFs portfolio. Exploiting a unique survivorship-free data set of 121 passive U.S. equity SRI ETFs from the time period of January 2010 to December 2020. The results from the Carhart four-factor model imply that on the full sample period from January 2010 to December 2020, the passive S&P500 ETFs are performing better than the passive SRI ETFs. The SRI ETFs are generating a negative annual alpha of 7.06%, while the S&P500 ETFs generate negative annual alpha of 1.86%. These results are significant for both of the sample groups. These results are similar to Meziani (2014), who provides evidence that the SRI ETFs are not performing as well as their benchmark index prior to 2015. However, narrowing down the sample period to January 2015 to December 2020, the SRI ETFs start to perform better than the S&P500 ETFs. The SRI ETF portfolio yields 0.08% annual alpha while the S&P500 ETF portfolio yields annual alpha of negative 2.32%. The SRI ETF portfolio loses its significance in this time period. Furthermore, limiting the sample period to account for the last two years (January 2019 to December 2020), the SRI ETF portfolio yields 5.33% annual alpha while the benchmark portfolio is yielding negative 2.60% annual alpha. These results stay significant correspondingly at 10% level and 5% level. Thus, the difference portfolio increased to 6.74% in favor of the SRI ETFs.

This thesis provides evidence that passively managed socially responsible ETFs are not consistently losing to the passive ETF counterpart that does no SRI screening. The results are also consistent even after controlling for the fees, which are higher for the SRI ETF portfolio than for the S&P500 ETF portfolio that does no screening. Therefore, as the previous evidence finds out, socially responsible investing can generate better alpha than a conventional counterpart. Furthermore, this thesis is a significant contribution to academia considering SRI ETFs. The previous research of passive SRI funds mainly focuses on mutual funds and founds no consistent evidence for underperformance or overperformance (e.g., Bauer, Koedijk & Otten, 2005; Renneboog et al., 2008; Chang, Nelson & White, 2012; Nofsinger & Varma, 2014). Therefore, we can think that the results are in line with the previous studies on mutual funds that SRI is not consistently losing to its counterparts, and it can generate better alpha depending on the time period and data sample used.

On the other hand, the results are statistically significant at the full sample period favoring the S&P500 ETF portfolio, which overperforms the SRI ETF portfolio. The results are also statistically significant at the last sample period consisting of the two last year's where the SRI ETFs overperform the S&P500 ETFs. The economic significance of these results is also moderate since on the full sample period, the return difference was 6.58% annually in favor of the S&P500 benchmark portfolio, while the last two years, the return difference was 6.74% in favor of the SRI ETF portfolio. Therefore, there is an economically huge return difference between the two portfolios.

As demonstrated in the theoretical part, the ETFs and SRI are both relatively new financial inventions. They have both had significant growth after the financial crisis of 2009. The unique data sample in this thesis also provides evidence that most of the SRI ETFs are issued after the year 2015. Therefore, the sample period from 2010 to 2015 demonstrates the beginning of the SRI ETF industry when there were only 24 SRI ETFs available for investors. The markets and instruments for SRI ETFs are developing more after the year 2015. This can explain the results from the regressions. The younger the industry for SRI ETFs is, the poorer the instruments are performing. While the industry

develops after the year 2015, the SRI ETFs start to perform better when the screens and methods develop with the products.

The second objective is to examine what are the differences between screening strategies (Inclusion and Exclusion) by SRI ETFs and what are the attributes (ESG and product-related) that create the value in SRI ETFs and drive the performance results. Previous evidence points out that the different screening criteria's and ESG dimensions might have a different effect on financial performance. For example, Derwall et al. (2005) find firm-specific abnormal returns on environmentally clean firms, Edmans (2011) and Derwall et al. (2011) on firms with high employee satisfaction, and Bebchuck et al. (2009) on firms with good corporate governance, and Kempf and Osthoff (2007) on firms with good environmental performance. Further, Humphrey and Tan (2014) argue that using exclusion can result in increased risk and lower returns, and Nofsinger and Varma (2014) show overperformance for funds that use positive screening in the ESG dimension.

The empirical part of this thesis divides the sample group of SRI ETFs into different categories regarding their screening style and ESG attribute. Inclusion strategy (positive screening) demonstrates significant negative alpha of 6.31% annually for the full sample period of January 2010 to December 2020. Furthermore, Environmental Inclusion demonstrates significant negative annual alpha of 5.61% in the first sample period. Narrowing down the sample to the last two years, the same categories now exhibit huge positive abnormal returns. The inclusion strategy yields annual alpha of 7.81%, while the Environmental Inclusion yields annual alpha of 13.80%, being statistically significant at a 1% level. Therefore, Environmental Inclusion drives the results statistically significantly as well as economically significantly. These results are similar to Kempf and Osthoff (2007), who demonstrate overperformance for firms with good environmental attributes, and to Nofsinger and Varma (2014), who demonstrate overperformance for positive screening.

This thesis and its findings offer answers for investors considering socially responsible investments, ETFs, and passive asset management, individually and as a combined

investment instrument. The results imply that investors considering passive U.S. equity SRI ETFs, the investors are not consistently losing to a passive counterpart that does no screening for SRI. The latter part of the research period, from January 2015 to December 2020, demonstrates that the investors have the potential to gain value from the SRI ETFs as the industry develops. Furthermore, the results imply that it is the SRI ETFs that incorporate Inclusion (positive screening) and further the Environmental Inclusion as a strategy that drives the abnormal returns. In other words, this thesis provides evidence that the investors do not consistently lose to counterparts by choosing an SRI ETF.

As a final conclusion, the financial performance and sustainable attributes do not exclude each other when investing with ETFs. Therefore, one can do great while doing good in the investment landscape, and the ETFs offer a transparent and cost-efficient vehicle to practice this. This thesis gives reference to investors that they can be satisfied with the financial performance when choosing ETFs incorporating Environmental Inclusion.

The results cover only the U.S. equity ETF market and therefore extending the results to outside the U.S. is misleading. However, as the U.S. is the leader and market-dominant in the field of ETFs and SRI, it offers the widest research in the field. Other limitation is the available data for SRI ETFs. This thesis focuses on the most recent eleven years (January 2010 to December 2020). As the SRI ETF industry develops more and more time-series data will come available to improve the results of the performance axis. Still to mention, the data should be survivorship bias free. However, collecting the data manually from many different databases, there is a possibility that some funds are left out of the scope of this thesis. The problem is that there is no encompassing way to gather all information of the available SRI ETFs. Similar to Nofsinger and Varma (2014), many researches are carried out to obtain the most suitable dataset available.

The future research of passive SRI ETFs could further narrow down the ETFs to purely passive ETFs by using the Active share presented by Cremers and Petajistö (2009). As the SRI ETF industry grows, more data will come available and eases the trouble of manually

collecting the data from holdings and strategies. In addition, as time passes, much more time-series data of the SRI ETF performance will come available, and furthermore, more products will come available.

Future research could also focus on evaluating the socially responsible ETFs more precisely, for example, by measuring the sustainable rating providers empirically to choose the right corporations acting in a socially responsible way. Also, a need for consolidating the ratings as united is needed like Dorfleitner et al. (2015) demonstrates that different ratings are affecting the results. To answer what is actually socially responsible still persists. Gladly, initiatives like the EU Taxonomy have the potential to harmonize the industry. Based on this thesis, future research could also investigate how much investors actually appreciate the differences between the non-financial attributes and the financial performance.

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