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**Socially responsible investing versus sin stocks: Comparison of  
returns**

Bachelor's thesis

International Business Administration, Finance and Accounting

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I hereby declare that I have compiled the thesis independently and all works, important standpoints, and data by other authors have been properly referenced and the same paper has not been previously presented for grading.

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## **Abstract**

This thesis provides a brief review of socially responsible investing and sin stocks. These two are considered opposite approaches in investing. The aim of this paper is to find out which of these approaches provides higher returns. To examine this study used three ETF (exchange-traded fund) portfolios. These portfolios were made for both SRI and sin, and one as a benchmark. Capital assets pricing model (CAPM) regression was used to achieve the results of this study. The regression analysis results indicate that sin stocks yield slightly better than socially responsible investing, but both lose to the benchmark.

**Keywords:** Investing, socially responsible investing (SRI), sin stocks, CAPM

# 1 INTRODUCTION

The fundamental purpose of investing is to increase wealth. From the point of view of an investor, investing means buying, owning, and selling various financial instruments with the aim of making a profit. There are many investment targets, but the most familiar to private investors are company shares and funds that own company shares. This broad investment world also includes investment strategies. There is a trending strategy called socially responsible investing (SRI) among these strategies. As well as a strategy considered the opposite of SRI, where investors choose sinful companies instead of responsible ones. This strategy is called sin stock investing. This paper will focus on both approaches and examine which is more profitable from 1.1.2015 to 30.9.2021. (Pörssisäätiö 2017; UNPRI 2021)

Socially responsible investing has grown in popularity in recent years as an investment strategy. One reason for this is that climate change and responsibility have increased; there are discussions in international politics regarding these matters. Also, the increase in the amount of information and education of investors has impacted the popularization of socially responsible investment. With this, researchers have also become interested in the returns on sin stocks, which are companies operating in industries that are considered sinful in the public's eyes. One popular strategy for responsible investment is the so-called negative screening, in which sin stocks are excluded from the portfolio. Sin stocks are generally thought to outperform the market, which has sparked a debate on whether responsible investors will have to settle for lower returns than typical stock investment. Nevertheless, when looking at previous studies on the subject, no unanimous answer has been found because the results are conflicting. (Humphrey & Tan 2014; Fabozzi et al. 2008)

Many studies examine both SRI and sin investing individually and combined in literature. Many studies support the overperformance of socially responsible investing (for example, DiBartolomeo & Kurtz, 1999; Abramson & Chung, 2000; Shank et al. 2005). Many studies state that SRI yields no abnormal returns. (Hamilton, Jo, & Statman 1993) Further, studies promote the idea of sin stocks to generate abnormal returns (Salaber, 2007; Hong & Kacperczyk, 2009; Trinks & Scholtens, 2017). Furthermore, for example, studies supporting mixed results Barnett and Salomon (2006) and still studies supporting even performance for both of the strategies (Lobe, Roithmeier, Walkshäusl (2009).

This paper aims to answer the above discussion and determine whether investing in SRI can yield higher returns than investing in sin stocks or the sin stocks that are performing better than the SRI strategy. Due to the varied nature of previous results, this thesis matches SRI and sin stocks by ETF portfolios to capture their effect on the performance measures. In addition, ETFs offer a transparent, cheap, and neutral method to examine the performance since no active asset manager's luck, skill, or miss timely asset purchases are accounted for in the ETFs. This thesis will merge these two phenomena by examining the existing literature of these two subjects. The thesis will present existing literature regarding the performance of socially responsible investing and sin stock investing. Finally, using a unique dataset of U.S. equity SRI and sin stock exchange-traded funds from January 2015 to September 2021, this thesis examines SRI ETF portfolio and sin ETF portfolio performance over similar SP500 ETF portfolios that account as the benchmark.

The rest of the thesis is structured as follows. The first chapter is an introduction to the thesis. The second chapter presents the idea and background of socially responsible investing and sin stocks. The third chapter will present the existing literature on the performance of these two themes. Further, the data and the methodology are presented in chapter 4. Finally, chapter 5 presents the results based on the data and methodology. Chapter 6, as the final chapter, conclude the thesis.

## **2 BACKGROUND**

This chapter provides background knowledge of socially responsible investing and sin stocks. The first sub-chapter introduces what socially responsible investment is and what principles and strategies are included. The following chapter will go over the background of sin stocks, introducing the most significant sin industries and briefly introducing risks in sin stocks.

### **2.1 Socially responsible investing**

Socially responsible investing (SRI) is a relatively new investment concept, but it has origins already in early biblical times where Jewish law taught how to invest in an ethical manner. The phrase ethical investing was used in the past, but responsible investing had replaced the word mainly when institutional investors embraced its use. (Sparkes 2002)

Responsible investing is developed based on ethical investing, where values guide investment activities. In other words, ethical and qualitative measures are evaluated next to quantitative measures when making investment decisions. In ethical investing, it is more critical to invest according to your values rather than the returns you might get from the investment. The most common tool for ethical investing is exclusion. The most common excluded industries have been the arms, tobacco, alcohol, and gambling industries. (Hyrskke et al. 2020)

Despite the connection to ethical investing, we must understand that responsible investing is a broader concept and a more diverse form of investing. Responsible investing has expanded the concept of ethical investing and created an opportunity to combine ethical perspectives with productive investment activities. Ethical investing is perceived as challenging because quite rarely, investors' views on ethics are entirely similar. In addition, an ethical investment strategy can affect the portfolio decentralization opportunities and thus hurt returns in the long run. Responsible investing and consideration of ESG factors offer a good continuum for ethical investment and bring a solution to its challenges while also improving the risk and return profile of the investment portfolio. (Hyrskke et al. 2020)

Socially responsible investing has grown in popularity in recent years. Both individuals and institutional investors pay attention to the environment, employees' treatment, and governance

factors. These so-called ESG (Environmental, Social, Governance) -factors are considered as part of the risk-return profile of the investment portfolio. Several studies have been conducted on SRI with conflicting results; however, companies and investors recognize that ESG factors affect their reputation, returns, costs, and revenue development. (UNPRI 2021; Hyske et al. 2020)

Nowadays Socially responsible investing (SRI) term has established its place, and it is being used internationally. Socially responsible investing has already been practiced in the US since the early 20th century. For religious reasons, investors began to avoid investing in companies that practiced business in the tobacco, alcohol, or gambling industries. Recently, the discussion on responsible investing has focused on non-financial factors in addition to the risk-return framework. Investment decisions include expected returns and portfolio risk as well as ESG factors. This change is due to the lessons from recent economic crises. (FINSIF 2019b; OECD 2007)

## **2.2 ESG - Environmental, Social, Governance**

When examining responsibility and responsible investing, ESG appears strongly, which stands for Environmental, Social, and Governance. It refers to companies' environmental and social responsibility and corporate governance topics. These ESG criteria set standards for companies, which are analyzed by investors and then utilized in investment decisions. Environmental criteria are taken into account in how the company innovates to reduce its emissions or uses existing resources. Social criteria, in turn, deal with how the company manages and treats its employees, clients, and other stakeholders. Governance criteria analyze company management, management salaries, audit, and internal control. (Galbreath 2013)

ESG investing is part of responsible investing, which can be seen as an umbrella term for responsible investing strategies. The term ESG has been defined in several different ways by different researchers. However, almost everyone agrees that ESG is considered a general term in the capital markets used by investors to assess the behavior of companies and determine the core impact of their businesses next to their financial performance. In addition, ESG is perceived as a non-financial performance indicator. (Galbreath 2013)



ESG investments have grown exponentially in recent years, especially among institutional investors and pension funds. Institutional investors have to act in the long-term interests of their beneficiaries, in which ESG investment is believed to play an increasingly important role. In addition to high volume investors also private investors have incorporated ESG factors into their investment strategies. Equity brokers and mutual funds have launched funds that follow the ESG criteria. These ready-made products have further increased interest among investors, primarily because of their ease. (Himick 2011) For example, according to a report by US SIF, in 2020, investors held investment products worth 16.6 trillion selected on ESG criteria when 2 years earlier, the amount was only 11.6 trillion. The growth of assets is not driven by revenue maximization rather the desire of investors to invest in companies that match their values. (US SIF 2020)

### 2.3 Responsible investing principles and strategies

International agreements, instructions, and principles have created excellent guidelines for responsible investing. One of the most significant guidelines for responsible investing is the United Nations Principles for Responsible Investment (UNPRI), published by the United Nations in 2006. The signatory is expected to commit to six principles from the UNPRI. (FINSIF 2019; UNPRI 2021)

Table 1. United Nations Principles for Responsible Investment (UNPRI)

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

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Source: (UNPRI 2021)

**Principle 1:** The organization should mention ESG issues in its investment policy and support the development of ESG tools, analyzes, and statistics. ESG issues should be evaluated regularly, and investment service providers should include ESG issues in their research.

**Principle 2:** The organization should develop an active public ownership policy and exercise its voting rights at general meetings. The goal is to have an active dialogue with companies and participate in developing standards, controls, and principles. Portfolio managers and fund managers in companies can be encouraged to participate in ESG advocacy projects and report on them. Joint impact initiatives are also a good way for active ownership.

**Principle 3:** Organizations may request companies to report on ESG issues in a standard format (such as the Global Reporting Initiative) and to include ESG issues in their annual reports. Companies should be asked to provide information on the use or implementation of relevant norms, standards, and international initiatives. Support shareholders' proposals that promote the publication of ESG matters.

**Principle 4:** Include ESG requirements in the selection criteria for service providers. ESG expectations should be actively communicated to investment service providers and providers who do not meet the ESG requirements. Support the development of benchmarking tools and supervisory or policy changes aimed at increasing the use of guidelines.

**Principle 5:** Organizations can participate in a variety of networks to combine tools and resources. In cooperation, it is worth highlighting new, emerging themes and developing and supporting community initiatives.

**Principle 6:** Organizations should communicate openly about how ESG points have been included in investment activities and publish their active ownership policies and requirements for service providers. Also, it is good to report progress and achievements at regular intervals.

These principles are for those investors who want to achieve long-term profits in a sustainable, responsible, and economically productive way. Carrying out these guidelines, investors commit to the progress of making a more sustainable financial system through long-term value creation. (UNPRI 2021)

Responsible investment approaches can be divided in different ways, and the use of different approaches varies from country to country and from an investor to investor. Responsible investing can be achieved through negative screening, positive screening, ESG integration, active

ownership, and impact investing. Investors can use several different approaches as they are not mutually exclusive. (UNPRI 2021)

Responsible investment approaches are influenced by what the investor does want to emphasize when investing, what kind of strategy and resources he has in place, and how deeply he wants to delve into the subject. For example, retail and institutional investors have different opportunities to take advantage of different approaches in their investment activities. Approaches to responsible investing also differ from the perspective of a pension company and a small foundation. (FINSIF 2021a)

**Negative screening** refers to the exclusion of something. Exclusion is the most common and the most straightforward approach to responsible investment. As an approach, it has its roots in the history of ethical investing. In negative screening, the investor identifies those industries or activities that she does not wish to finance. The investment targets are then selected from the remaining investment targets. Activities that are generally excluded reflect societal perceptions and the culture of society. The biggest challenge in negative screening is zero tolerance, meaning that all companies that are even indirectly involved in the excluded activity would be excluded from the investment. This challenge is especially with investment portfolios, and usually, some limit value is used to measure exclusion. (Hyrskke et al. 2020)

As a strategy, **positive screening** is the opposite of negative screening. Positive screening is used to select the companies you specifically want to invest in. Whereas in negative screening, you are looking for companies and industries excluded from the investment portfolio, in positive screening, the investor herself must determine by her means which responsible companies are. Negative screening excludes only a few percent of the investment universe; positive screening, on the other hand, cuts out most potential investment targets, posing entirely new challenges to corporate responsibility analysis. There is no established general practice for positive screening. However, every investor or portfolio manager herself determines which factors are favored in her corporate responsibility analysis and how to build her investment portfolio. (Hyrskke et al. 2012)

From all the approaches in responsible investing, integration takes responsibility to the furthest. However, **ESG integration** does not have a fixed definition, allowing each investor to exercise it in the way they see fit (Silvola & Landau 2019). In the investment analysis that integrates ESG,

the responsibility criteria are comprehensively taken into account alongside the analysis of the financial figures. ESG factors may be associated with the environment, energy efficiency, or the composition of the company's board. ESG data is used in making investment decisions and analyses, as it is expected to affect the return and risk profile of the investee in the longer term. (Hyrskke et al. 2020; FINSIF 2021b) Implementing ESG integration requires lots of resources. For example, large institutional investors have the opportunity to acquire ESG data from external service providers to support their analysis. (Silvola & Landau 2019)

## **2.4 Sin stocks**

Although sustainable and responsible investing is connected to good standards and moralities, sin stocks are extensively related to the opposite. Sin stocks are companies that make their revenue from human vices, such as gambling, alcohol, tobacco, and arms industries. Also referred to as vice stocks, shunned stocks, controversial stocks, and unethical stocks. In the public's eyes, these are often seen as dishonest and unethical. Therefore, they are often eliminated from responsible investment portfolios due to negative screening. (Blitz & Fabozzi 2017)

For many investors, sin stocks are not an investment option because such investments do not match their moral vision, but the fact is that several of the sin stocks are overall good and stable investments. The nature of the companies guarantees a steady flow of consumers. As demand for products and services is relatively stable, these companies' business is guaranteed even in economic downturns. Less competition in the industry also guarantees good margins and fixed returns. Sin stocks can also be used as a shield in times of crisis. Demand for sin products will not change even in a recession or economic crisis. Making sin stocks a good investment target considering performance. (Investopedia 2021; Chatjuthamard et al. 2018)

The negative image of sin stocks is causing analysts and investment companies to avoid them. As a result, sin stocks are currently highly undervalued. Therefore, sin stocks are an attractive investment for investors willing to make a riskier investment. Most of the most extensive sin stocks have had high long-term returns. (Investopedia 2021)

Blitz and Fabozzi (2017) point out that the perception of what is seen as sin may change over time. The product range and sources of income of companies currently classified as sin stocks may

change, leading to reclassification. For example, Heineken and Anheuser Busch have declared their intention to market their nonalcoholic products vigorously. The contrary may also happen. Companies turn from ethical to unethical as a consequence of changing social norms. It is possible that eventually, blue-chip companies like Coca-Cola and McDonald's will be stamped as sin because people have started to consider them as vices. (Blitz & Fabozzi 2017)

There is always risk involved when it comes to investing. In sin stocks, it is slightly different; for sin companies, the risk does not only come from consumers and the market but also legislators. Sin companies are under constant pressure from the public, and at any given moment, the law might be changed, or an advocacy group can get enough support to ban a whole product. Sin companies already operate under strict regulations, which are only getting stricter. Not only is there the risk of a product getting boycotted, but for many investors, especially institutional investors, there is the company's image and reputation at risk as well. (Hong & Kacperczyk 2009; Kim et al. 2014)

Tobacco is one of the biggest health threats humans have ever faced. The amount that tobacco kills each year exceeds over 8 million, from which 7 million uses tobacco products directly and over 1.2 million die cause of exposure. All forms of tobacco are harmful; indirect exposure to tobacco is not suitable for health. There are approximately 1.2 billion tobacco product users globally, from which 80% live in either low- or middle-income countries. In these countries, the consequences of tobacco use are the most severe. In these countries' tobacco increases poverty by shifting household expenses from necessities to tobacco. (WHO 2021). There are many problems with the farming of tobacco leaves, such as environmental degradation and farmers' health risks. Nevertheless, we must remember that even though global tobacco reduction can have many positive health effects, it can have negative economic consequences for tobacco growers, a large part of them are in developing countries. (Smoke Free World 2021; WHO 2021)

The tobacco business has been regulated to reduce people's demand and interest in tobacco products. For example, warnings have been placed on the packaging of tobacco products that increases people's awareness of the dangers of tobacco. Also, tobacco has its regulations regarding advertising. Tobacco companies cannot advertise their products on television or give discounts on their products. (Drope et al. 2018) In the United States, smoking rates have declined since the mid-20th century. However, the United States remains a growth market for the tobacco industry, attributed to population growth. Many state conditions are equated with those in

developing countries. Low tobacco taxes, fragmented legislation, and political influencers who adopt smoking serve as a good opportunity for tobacco companies. Despite specific tobacco regulation laws, tobacco companies see the United States enabling long-term growth. (Glenza 2017)

Gambling is when you bet or stake something of value, usually money, without knowing the result. According to Buchdahl (2003), there are two critical differences between gambling and investing. The first one relates to exposure of risk. In gambling, the player often loses his total bet if he is wrong, but in investing, it is unlikely that the investor would lose all the funds invested in the investment. Another difference between gambling and investing is speculation over time. We often talk about weeks, months, or even years' time span in investment. In gambling, on the other hand, the result is clear often in a few hours. Buchdahl has found gambling to be high-risk, short-term speculation, while in turn investing, he sees it as low risk as well as a long-lasting activity. (Buchdahl 2003)

There are many different ways to gamble; the most common are visiting a casino where customers can gamble in person. However, another method has become more prevalent in gambling nowadays: online gambling. In online gambling, a player gambles over the internet, and it is possible to do it anytime, anywhere. (Lock 2021)

It is believed that there are five reasons to engage in gambling. The first reason is monetary. The person wants to win a prize or money. The second one is for social reasons. The person wants to socialize with people, either with friends or with people he has just met. The third one is that person wants to cope and escape reality for a moment. The fourth one is for recreation, to have a little bit of fun and let loose. The fifth one refers to enhancement. People are interested in learning something new and in challenging themselves. (Brochado et al. 2018)

Alcohol is an intoxicating substance with addictive properties; it has been used across the globe in many cultures for ages. Excessive alcohol consumption can cause mental health problems, other illnesses, and difficulties in social and economic life. (WHO 2018)

The market for alcoholic beverages includes all drinks made by fermentation or distillation. The most consumed drink is beer, with an alcohol content of around 5%. Due to this popularity, breweries are leading the alcohol industry. (Statista 2021)

The alcoholic beverages market is divided into two, the first being the so-called at-home market; this consists of supermarkets, convenience stores, and other similar stores where you can buy out. The second is the away-from-home market, including hotels, restaurants, cafes, and bars. Both are valued at standard selling prices, including sales and consumption taxes. (Statista 2021). The value of the alcohol market was valued to be \$ 1.439 billion in 2017. It is estimated to increase in value to 1.684 billion by 2025. In that case, the alcohol market would have a 2% CAGR. The growth of the alcohol market can be explained by the increase in the disposable income of young people and adults and the increase in consumer demand. However, market growth will be slowed down by awareness of the health problems brought by alcohol and the growth of the non-alcoholic beverages market. (Prasannan 2018)

Studies usually focus on the three primary sin industries regarding sin stocks. However, I think that mentioning other sinful industries is essential since the definition of sin is subjective. These industries can be as sinful as the three primary ones for some people.

Adult Entertainment. Frequently adult entertainment is ruled out of sin stocks. This is because there is not a precise classification for the industry. Adult entertainment is often included as part of the restaurant industry because they usually provide food and beverages. However, when they are included, the companies are engaged in producing or distributing sexual products and services. (Lobe and Walkshäusl 2016; Trinks and Scholtens 2017)

Health. According to Blitz and Fabozzi (2017), it is likely that firms operating in "unhealthy" industries such as Coca-Cola and McDonald's will be treated sinful in the future as the current global emphasis on health continues to grow. So far, however, most studies on sin stocks do not include sweet food and beverage companies.

Arms. Opinion on the arms industry is divided around the world. It is why the arms industry is often left out from the sin category. Although some look at this industry as sinful, others recognize it necessary for the defense of their country. For example, the firearms industry has grown significantly in the United States over the past decade, creating many jobs nationwide. (NSSF 2021)

### **3 LITERATURE REVIEW**

The following section reviews previous studies in two sections. The first sub-chapter is for SRI and the latter for sin stocks. Studies are in chronological order, and they show us some history of the field and different measurement styles for these investment strategies. These studies give foundations to this thesis research question and further the need to answer this question.

#### **3.1 SRI studies**

Hamilton, Jo, & Statman (1993) made the first influential research on the performance of SRI. They selected 32 funds and analyzed their performance over 9 years (1981-1990). They used Jensen's Alpha to calculate the excess return of the portfolios. Their research results show that mutual funds with social responsibility do not create substantial excess returns. Their performance is no different from that of standard mutual funds.

DiBartolomeo & Kurtz (1999) used arbitrage pricing theory to prove that social responsibility is not a value-reducing factor. They tracked the Domini 400 and the Standard & Poor's 500 Index from May 1990 to January 1999. They used an APT model to find all the sensitivities to every factor. Afterward, they re-weighted the Domini 400 portfolio in a way that matched the Standard & Poor's 500 indexes. They found out that the unoptimized DSI 400 was better than that of the S&P 500 index, and the DSI 400 with optimization was not significantly different from that of the S&P 500 index. They also assume that the growth of the unoptimized DSI is linked to bull markets, and because of this, the bias makes social screening seem to be a factor.

Abramson & Chung (2000) conducted the first meaningful research on socially responsible investment as a segment of value investing. Through the relative dividend yield, relative market value, and income measurement standards, they distinguished value stocks from DSI 400. Then they compared the subset of DSI 400 with other value indexes from 1990 to 2000. Performance was measured in terms of quarterly rebalancing strategies and buy-and-hold strategies. They found that the returns generated by these two strategies are higher than the benchmark average. According to their findings, socially responsible investing is neutral in style.



Barnett & Salomon (2006) studied the relationship between social responsibility and financial performance. Their research focused on the emphasis on screening. They used 61 socially responsible funds and the study period was from 1972 to 2000. They measured financial performance monthly and social performance, with the number of screens used. They discovered that when the number of screens rises, performance drops first but then rises. Barnett and Solomon interpret that there are two factors to this. First, there is no significant difference between funds that only use a few screens and regular funds, so they will not influence the performance. Secondly, funds that place a high number of screenings tend to choose firms with high standards, which, based on stakeholder theory, should lead to outstanding performance. Funds in the middle ground produce problems, they are missing diversification, and they cannot run only companies with a firm social responsibility.

Lobe, Roithmeier & Walkshäusl (2009) created a direct comparison method between socially responsible investing and unethical investing. They made a sin index with 755 sin stocks from 51 countries. Then they compared 32 globally recognized SRI indexes and their index. Indexes efficiency was measured using CAPM as well as multifactor models. To their surprise, risk-adjusted returns were without any substantial difference. Also, performance-wise they were even. Lobe et al. point out that the sin indexes are value-centered while the SRI indexes are growth-centered. Also, personal preferences based on ethics can be considered while making an investment plan because they do not seem to make a notable difference in performance.

### **3.2 Sin studies**

Shank et al. (2005) studied 3 different portfolios over 10 years period. The first portfolio consisted of socially responsible stocks. The second was a sin stock portfolio, and the third was a benchmark. For the first 3 years the studied portfolios did not significantly differ in risk-adjusted returns. After 10 year-period, resignation began to show. Results showed that the SRI portfolio outperformed the 2 other portfolios.

Salaber (2007) examined whether legal and cultural factors impact sin stock returns. She found that their risk-adjusted returns are higher when sin industries are located in countries with higher consumption taxes. When litigation risk is immense, sin stocks are expected to do better than other stocks. In her study, she also found that protestants seem to avoid sin stocks the most when religion is considered a factor. A few years later, Salaber (2009) conducted another study in which she

found that when the economy is in recession, sin stocks will continue to exist like other stocks. However, amidst bad times, sin stocks will outperform the market. They suggest that investors investing in a socially responsible manner will have additional costs due to their moral principles.

Hong & Kacperczyk (2009) have done one of the most substantial researches regarding sin stocks. They studied 184 US stocks from the sin industries from 1926 to 2006. These included companies from the tobacco, alcohol, and gambling industries. They found that after they adjusted the Carhart four-factor model, the performance of sin stocks exceeded their benchmark of 29 basis points per month. In addition, their research results show that sin stocks being undervalued is a consequence of institutional investors avoiding investing unethically, and this is also the reason behind the excess returns. Hong and Kacperczyk also pointed out that because individual investors can conceal their investment from the public, they are more likely to hold sin stocks than institutional investors, as the investments of institutional investors are subject to continuous public monitoring.

Trinks & Scholtens (2017) studied the performance of sin stocks during the recession. They used 1600 stocks in their study, and they measured the risk-adjusted returns using the Carhart four-factor model. They found that sin stocks outperformed the market, performed even better than they would during stable periods. Also, they found that negatively screened SRI stocks would not give abnormal returns, and they would decrease and lose to the market during a recession.

Chatjuthamard et al. (2018) studied how do socially controversial companies do during crisis periods from 1995 to 2009. They found that controversial companies such as sin stock companies perform better than others during crisis periods, and sin stocks could be used for hedging. A portfolio with sin stocks in it is safer during crisis periods than one without.

As previous studies did not show consistency in their results, both SRI and sin stock studies have conflicting results, and no persistent abnormal returns can be found in previous studies, and due to the high volatility of the research results, it would be important to continue the research on SRI and sin stocks.

## **4 DATA AND METHODOLOGY**

This chapter demonstrates the data and methodology used in this study. It presents the OLS-regression used in the study. Socially responsible portfolio, sin portfolio, and an additional benchmark portfolio of SP500 are formed. They are described under their paragraph. These 3 portfolios are the explained variables during the CAPM regression. The portfolios are visible in the Appendixes. The closing prices are from Yahoo finance, while the explanatory variables for the regressions are from the Kenneth R. French database. The data sample period in this thesis is from 1.1.2015 to 30.09.2021.

### **4.1 The research portfolios**

The socially responsible portfolio is formed from 10 different socially responsible ETFs issued in the US. The 10 different ETFs are equally weighted in the portfolio. This study will only focus on US equity ETFs. Therefore, the study is limited to the United States and equity ETFs. ETFs are chosen due to their passive nature and availability to understand their investing principles. Therefore, the portfolio consists of many stocks considered socially responsible or sinful and limits the risk for a small sample size of a few specific stocks. However, the ETFs can still hold global equities. This limits the risk for active asset managers missing timely stock purchases, skill, or pure luck when picking stocks. All of the ETFs chosen incorporate the idea of socially responsible investing as described earlier.

The sin stock portfolio is created similarly to the socially responsible portfolio. 10 different ETFs are chosen that incorporate the idea of including stocks that are classified as sin stocks. These can be alcohol, tobacco, marijuana, arms, gambling, and others labeled as unethical. The market caps of the ETFs are as close to each other as possible.

A benchmark is needed to determine how well the portfolios of SRI and sin stocks perform. Improper selection of benchmarks can lead to biased results. Pricing models such as CAPM, the Carhart four-factor model and Fama French three- or five-factor model have been used in past studies, but they can be a poor choice as a benchmark because of the negative alpha values they might produce for passive indices. To evaluate the performance of ETFs and mutual funds, professionals usually use reliable benchmark indexes. (Cremers et al., 2012). The most suitable

benchmark should be a passive ETF with a similar risk profile as the examined portfolios include. As the research model market return factor causes the alphas to be negative, the chosen benchmark gives a good benchmark to evaluate the performance of the portfolios created in this thesis. Therefore, this study compares the SRI and sin portfolios to a portfolio of SP500 ETFs. They correspond to the focus group of this thesis, and therefore, all of the ETFs are pure equity ETFs. For example, Chakrabarty et al., 2017 compare their SRI ETF portfolio to a similar portfolio of SP500 ETFs as in this thesis.

Finally, Table below summarizes the data. The table visualizes information for the different portfolios formed.

Table 2. Descriptive portfolio returns

<b>Portfolio</b>	<b>Min</b>	<b>Max</b>	<b>Mean</b>	<b>Median</b>	<b>St.Dev</b>	<b>Kurtosis</b>	<b>Skewness</b>
<b>SRI Portfolio</b>	-0,1514	0,0842	-0,0030	-0,0028	0,0170	290,8539	-11,2280
<b>SP500 Portfolio</b>	-0,1202	0,0875	-0,0026	-0,0025	0,0119	15,5704	-0,7706
<b>Sin Portfolio</b>	-0,1083	0,0878	-0,0029	-0,0028	0,0129	10,6994	-0,8824

Source: Author's calculations

Table 1 above visualizes the data used in this thesis. The data is derived from daily returns because of the relatively short five-year period. The daily returns allow more data points when estimating the returns with the CAPM model. This is done to achieve more statistically significant results. In the case of monthly returns, the data series would be small and likely cause non-significant results. As shown in the next chapter, the results estimated from daily returns are significant and favor the daily return series.

Notable is that the mean and median returns are negative on the period. In addition, the most significant minimum returns for the day are pretty extensive. The daily returns are from the Covid-19 market crash, which takes place during the time series. The sin portfolio holds its value much better during the crisis from the minimum daily returns than the two other portfolios. The maximum returns per day are much more in line than the minimum returns. The SRI portfolio has the highest standard deviation and, in other words, volatility, while the SP500 portfolio is the most less volatile. Kurtosis is higher than 3 for all of the portfolios. The daily time series returns are, therefore, leptokurtic. All of the portfolios have heavier tails than a normal distribution.

Finally, the skewness is negative for all portfolios, indicating that more significant negative daily returns are more common than daily positive returns, as the max and min values also indicate.

Table 3. Portfolio summary data

<b>Full Period Summary Items</b>	<b>SRI Portfolio</b>	<b>SP500 Portfolio</b>	<b>Sin Portfolio</b>
# of all ETFs	10	3	10
# of unique ETF managers	7	3	6
Average ETF age	4,6	11	8
Median MCAP of ETFs (\$ in billions)	53,2	312,2	45,9
Median total expense ratio	0,25 %	0,08 %	0,71 %

Source: Author's calculations

Table 2 summarizes the data. It indicates how many ETFs are included in each portfolio that is made. It visualizes how many individual ETF managers is included. The data consists of as many different unique managers as possible to limit the risk of any in-house specific operation regarding the funds. The data also demonstrates the novelty of SRI and sin as industries compared to SP500 ETFs. The Sp500 was the first ETF created, and SRI and sin ETFs are much more modern innovations. This also promotes the period from 2015 to 2021 since there are few SRI ETFs before the 2015 time period. In addition, the data visualizes that the SP500 ETFs are much more popular than the two other ones regarding investors; they are much more prominent in size. Furthermore, the data demonstrate that investing in a socially sustainable manner is less expensive than investing in sin. However, they are still far more expensive than investing in a standard SP500 index.

## 4.2 Capital Assets Pricing Model

In the 1960s, William Sharpen (1964), John Lintner (1965), and Jan Mossin (1966) developed a model to calculate the expected return on the securities or portfolio. The model was called Capital Assets Pricing Model or CAPM. It is based on the modern portfolio theory developed by Henry Markowitz in the 1950s. The investor uses CAPM to predict returns based on the amount of risk in the investee. The model makes it possible to make different investment objects comparable and examine whether the expected return on the investment corresponds to the

amount of risk involved. The CAPM can also be used to estimate the expected return of unlisted securities. When a company goes public, CAPM can be used to estimate the stock's market price.

The CAPM is calculated as follows: 
$$E(r) = rf + \beta (rm - rf)$$

Where:

$E(r)$  is the expected return of investment,

$rf$  is the risk-free rate,

$\beta$  is the beta of the investment,

$rm$  is the expected return on the market and

$(rm - rf)$  is equity market premium.

The Beta is calculated as follows: 
$$\beta = \frac{Cov(r_i, r_m)}{\sigma_M^2}$$

Where:

$Cov(r_i, r_m)$  is the covariance between returns of the asset with the market

$\sigma_M^2$  is the variance of the market portfolio.

The beta coefficient of stocks is composed of the covariance of stock returns and market portfolio returns and the variance of market portfolios. As a measure of systematic risk, it reflects the part of the total risk that cannot be eliminated by portfolio diversification. For individual security, beta measures the variation in the return on that security in relation to the market portfolio. As a result, the beta of the market portfolio thus gets a value of 1.

If the beta coefficient is 1, it means that the price fluctuation or volatility of the security corresponds to the average price fluctuation of the security. Values below 1 mean that the price of the security changes less relative to the market. Values higher than 1 mean that the price of the security fluctuates more relative to the market. (Bodie et al. 2014)

Although CAPM assumptions are very theoretical and have given conflicting results in many empirical tests, it still is central to modern financial theory tools. It gives a good enough picture of the share price formation and the effect of risk expected return. (Perold 2004)

### 4.3 Jensen's Alpha

In 1968, Michael Jensen developed a metric to measure the success of a portfolio relative to the expected return. Jensen's alpha is based on the CAPM model, in which the beta of a portfolio determines the expected return.

Jensen's alpha is calculated as follows:

$$\alpha p = \bar{R} p - [\bar{R} f + \beta p(\bar{R} M - \bar{R} f)]$$

Where:

$\bar{R} p$  is the return on the portfolio

$\bar{R} f$  is the risk-free return,

$\beta p$  is portfolios beta

$\bar{R} M$  is the market return.

Jensen's alpha is used primarily in portfolio comparison. The higher the value of alpha, the more excess returns the investment has managed to generate. When alpha is negative, it means that the investment has performed worse than one would have expected based on the CAPM model. Prior to the Jensen alpha meter, returns were mainly comparable only in absolute terms. However, after the development of the meter, it was possible to measure success also in relation to risk. (Jensen 1968)

## 4.4 OLS-Regression

The CAPM model is carried over with classic linear regression (OLS, ordinary least squares). CAPM regression is extended from Markovitz Modern Portfolio Theory (Markovitz, 1952). The model is a linear least squares regression model where the unknown parameter is estimated. The CAPM regression describes the statistical relationship between one explained variable and one or more explanatory variables. The OLS regression chooses the parameters of a linear function from the set of explanatory variables by the principle of least squares. This is done to minimize the sum of the squares of the differences between the explained variable. The smaller the difference between each data point (daily return of portfolios in this thesis) and the corresponding point on the explanatory variables (market return from Kenneth French database), the better the model fits the data (Goldberg, 1964).

The explained variable (Y) for the CAPM regression is the excess daily return derived from the return of the SRI, SP500, and sin portfolios. The CAPM model data obtained from the Kenneth French database is the explanatory variable. So the explanatory variable is the market return minus the risk-free rate the French database provides. In this thesis, the explained variable is the daily returns obtained from the portfolios formed earlier in this chapter. Therefore, the daily returns of each portfolio are explained with the returns of market returns minus the risk-free rate from both return series. This is done as in similar papers where asset pricing models explain the SRI or sin portfolio returns. However, some studies use more advanced models like Fama and French three-factor models or the five-factor and Carhart 4 factor model. The CAPM is chosen due to its simplicity and the explanatory power it already provides.



## 5 RESULTS

Chapter 5 presents the results achieved based on the data and methodology used. Results are presented from the CAPM model for all the three portfolios.

Table 4. CAPM regression results

<b>Full Period</b>				
<b>Portfolio</b>	<b>Alpha</b>	<b>Beta</b>	<b>R2</b>	<b>Std. Error</b>
<b>SRI Portfolio</b>	<b>-0,90% ***</b> -[11,50]	<b>0,97***</b> [36,26]	<b>0,661</b>	<b>0,013</b>
<b>SP500 Portfolio</b>	<b>-0,80%***</b> -[36,33]	<b>0,98***</b> [130,16]	<b>0,953</b>	<b>0,007</b>
<b>Sin Portfolio</b>	<b>-0,86%***</b> -[20,50]	<b>0,95***</b> [65,88]	<b>0,848</b>	<b>0,007</b>

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 t-ratios are in the brackets below the alphas

As the results imply, all the portfolios show a statistically significant alpha on a 1 % level. The data points from daily returns prove much better statistically significant results than the monthly return series due to the number of data points. Therefore, we can think that the results achieved are statistically significant.

All the portfolios yield negative alpha during the period from January 2015 to September 2021. This was already discussed in chapter 4 where motivating for the data is discussed and argued the need for a similar benchmark index like the SP500 portfolio as the SP500 benchmark ETF also demonstrates a negative alpha for the time period of 2015 to 2021 where the markets have been in an upward trend except the market crash in 2020.

The sin portfolio is yielding better than the SRI portfolio or, in other words destroying less value. The SP500 portfolio is yielding better than the two other portfolios. The alpha for the SRI portfolio is -0,90% annually, while the sin portfolio alpha is -0,86% annually, which means that the sin

portfolio is performing better. However, the difference is subtle compared with all the 3 portfolios. The SRI portfolio is losing by 10 basis points while the SRI portfolio is losing by 6 basis points compared to the passive benchmark index.

The beta values demonstrate correlation with the market as they should be. SP500 correlates the closest with the CAPM model market returns achieved from Kenneth French Database with the value of 0,98. Further, the sin portfolio demonstrates the weakest correlation with the market with a beta value of 0,95.

The R2 values show that the data and model used work relatively well. SP500 portfolio has an R2 value of 0,953, which is close to 1, demonstrating that the CAPM model explains nearly fully the achieved values. The R2 value for the sin portfolio is 0,848, which is also relatively good compared with other similar studies. The SRI portfolio has an R2 value of 0,661, which is not the most significant explanatory power. This may be due to the small data size and sample period. This would only decrease if used monthly time series. However, the data period still demonstrates the short history of SRI ETFs and offers the most suitable dataset available.

## 6 CONCLUSION

The aim of this thesis is to determine which of these opposite investment approaches provide higher returns. The previous research of SRI and sin mainly focuses on mutual funds or pure equities and found no consistent evidence for underperformance or overperformance for neither of the two. (DiBartolomeo & Kurtz, 1999; Abramson & Chung, 2000; Hamilton, Jo, & Statman, 1993; Salaber, 2007; Hong & Kacperczyk, 2009; Trinks & Scholtens, 2017; Barnett and Salomon, 2006; Lobem, Roithmeier, Walkshäusl, 2009).

The achieved results from the CAPM model are statistically and economically significant providing useful information for investors considering ETFs, and Socially Responsible or sin investing. The sin portfolio and SRI portfolio might be losing to the market due to strict screens that result in diversification costs. In addition, the higher fees for the both SRI and sin portfolios are decreasing the returns for the investor. Like Guenster (2012) demonstrates SRI investors and SRI funds do face diversification costs due to limited possibilities for investment allocation. This gives the reference that the market is overperforming the sin and SRI portfolios.

However, investor interest has grown enormously as the assets under management of the SRI, sin, and ETF funds have proven consistent and rapid. ETFs, provide an easy and transparent way to measure the performance of both SRI and sin since asset managers' skill, luck, or miss timely done asset purchases are small compared to active asset management on mutual funds. Sin stocks prove to be better than the SRI funds. Since both portfolios lose to the market index, it can be thought that positive alpha firms are left out of the portfolios due to the screens in SRI and sin, resulting in lower returns. Like Humphrey and Tan (2014) show that excluding stock in one investing horizon may result in lower returns and increased risk.

To be good or to be bad? The financial wise answer would be to invest in sin stocks according to the data, time period, and model shown in this thesis. Still, Bollen (2007) demonstrates that investors may implement a multi-attribute utility function on their investment decisions. The multi-attribute utility function does consider personal and societal values over the financial return maximization. Environmental, social, and all sustainable preferences and the contrarian view for these values can be considered personal and societal values. Like prior studies indicate (Hong & Kacperczyk, 2009; Renneboog, Horst & Zhang, 2011; Hafenstein & Bassen, 2016), SRI and sin

stock investors might favor sustainability and responsibility well as unethical values, even though they might lose financially.

Future research should focus on examining the socially responsible and sin ETFs more accurately. The research could classify all of the sustainable ETFs from Morningstar Globes Category five and further classify all of the sin ETFs from Morningstar Globes Category one. Category five means that the fund is the most socially sustainable, and category one means the opposite. This classification would further give methodological support for the validation of socially sustainable and sinful companies. (Morningstar, 2021).

However, Dorfleitner et al. (2015) further demonstrate that the choice of the sustainability rating affects the performance results achieved from the regressions. So, the question remains which rating is sufficient and best to do an academic study. Therefore, the question of what is socially responsible and sinful remains.

This thesis provided evidence that investors still favor the SRI and sin investing methods regardless of whether they might perform as well as the market index. Bollen (2015) demonstrates that investors favor non-financial attributes more than financial performance. Future research could also focus on this non-financial and financial performance axis and the attributes that drive the popularity of SRI and sin investing.

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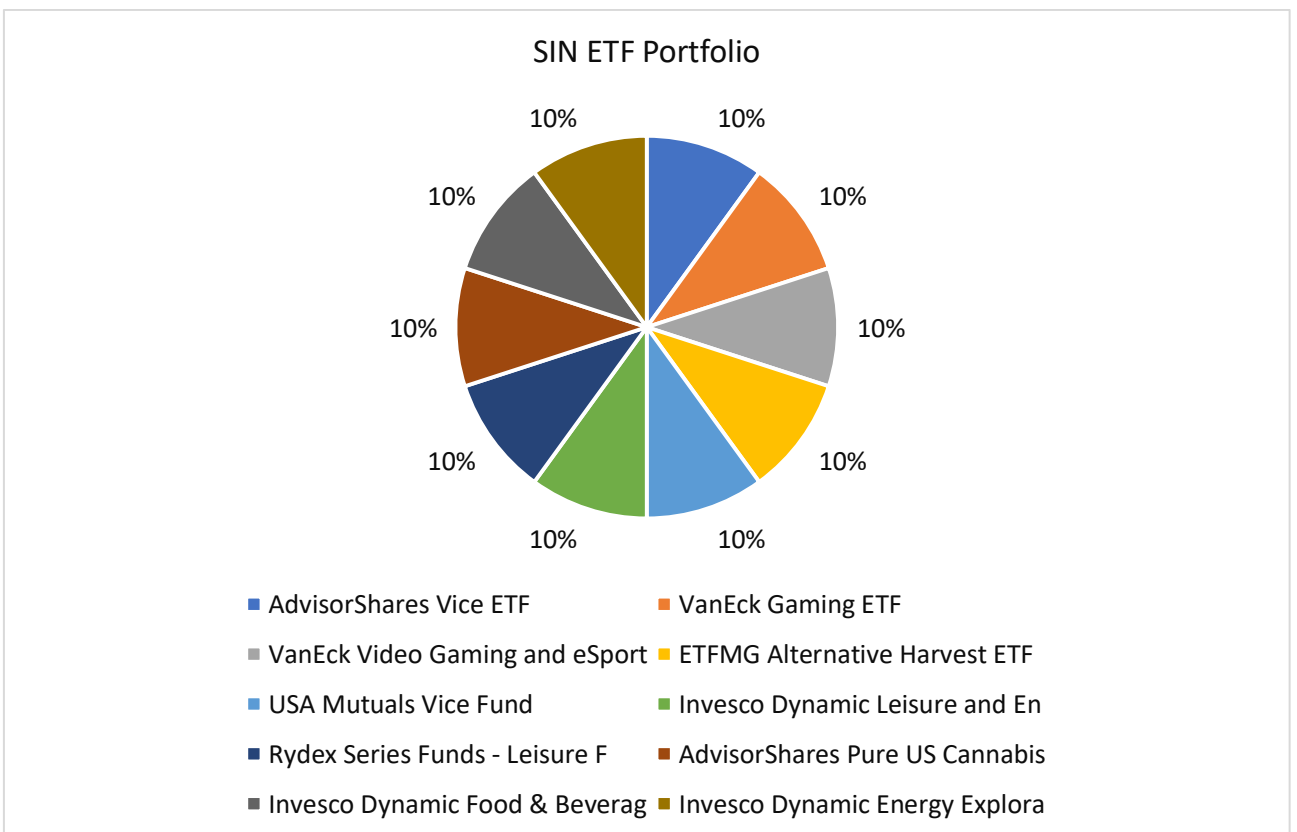
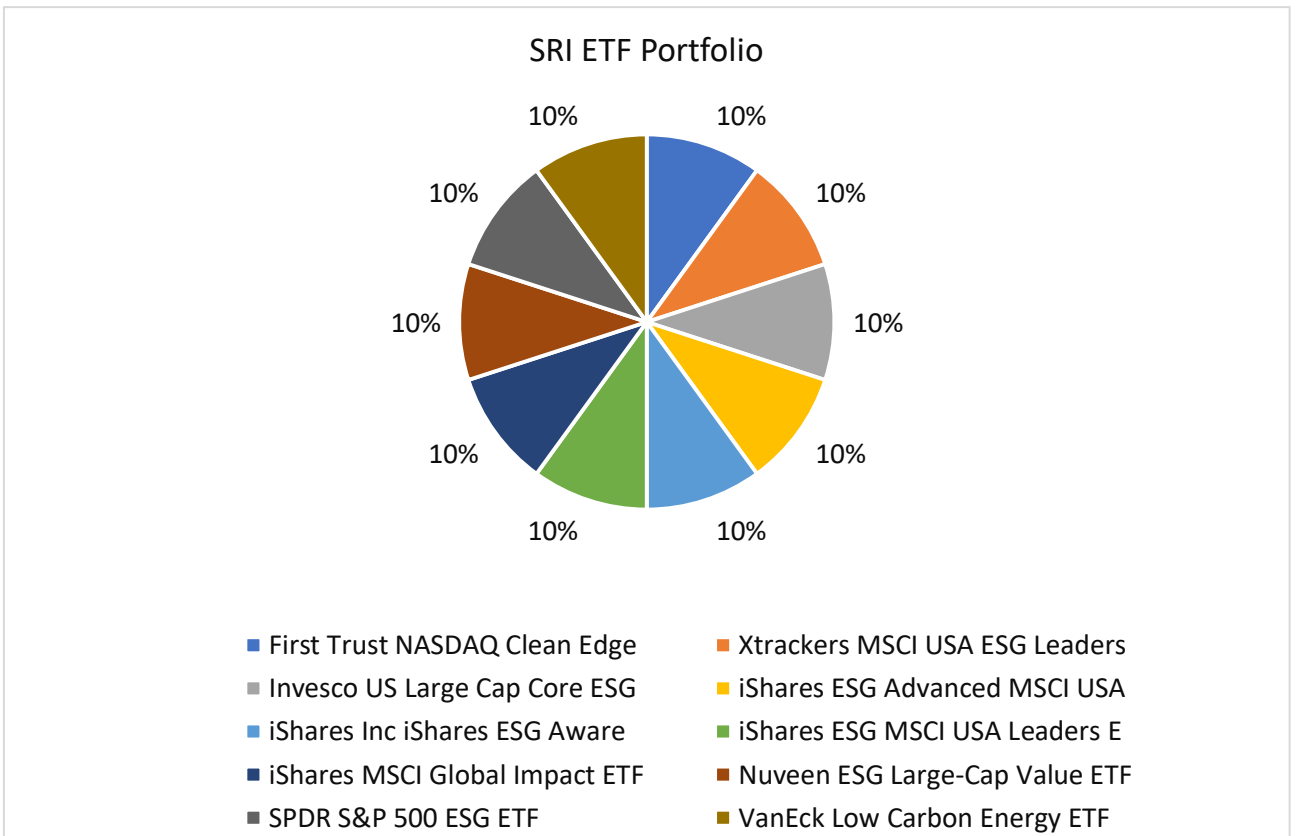
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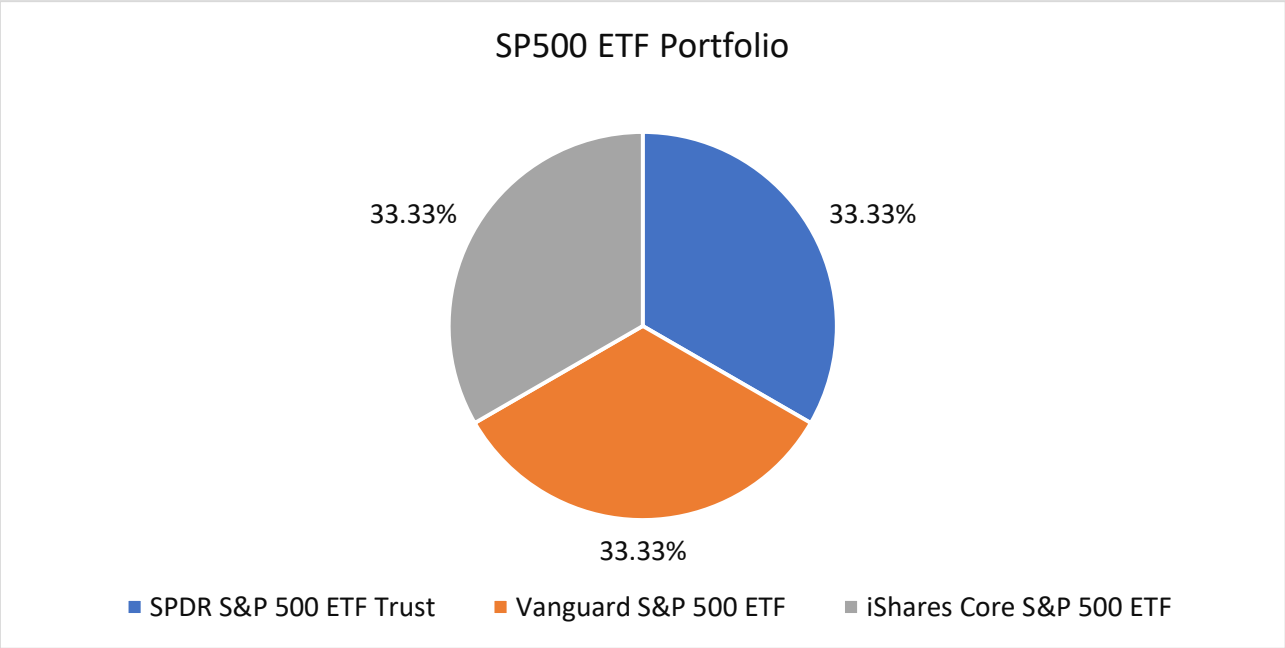
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**Appendix 1.** Different ETFs in the portfolios.





Source: Author's calculations

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