



Vaasan yliopisto
UNIVERSITY OF VAASA

Hannes Heinonen

**Exploring Finnish Sustainable Mutual Funds: A
Comparative Analysis of Returns and Risk-Adjusted
Returns Among SFDR Classified Mutual Funds**

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UNIVERSITY OF VAASA**School of Accounting and Finance****Author:** Hannes Heinonen**Title of the Thesis:** Exploring Finnish Sustainable Mutual Funds: A Comparative Analysis of Returns and Risk-Adjusted Returns Among SFDR Classified Mutual Funds**Degree:** Master of Science in Economics and Business Administration**Programme:** Finance**Supervisor:** Veda Fatmy**Year:** 2025 **Pages:** 72

ABSTRACT:

This research examines the EU's Sustainable Finance Disclosure Regulation (SFDR) classification and its impact on the returns and risk-adjusted returns of Finnish mutual funds. The purpose of this research is to determine whether mutual funds ranked higher in the SFDR classification scale (article 8 & 9) offer superior financial performance compared to conventional (article 6) mutual funds. The data set consists of equity, balanced, and fixed-income mutual funds registered in Finland. The selected sample period for monthly returns is from March 2021 to November 2024. The analysis utilizes several different metrics, such as cumulative returns, Sharpe ratio, standard deviation, CAPM, and Jensen Alpha, and results are compared to the MSCI World Index, which serves as a benchmark.

The results indicate that none of the mutual fund portfolios, whether sustainable or conventional, delivered positive risk-adjusted excess returns during the sample period. All portfolios exhibited statistically significant negative alpha values in the CAPM regression, suggesting consistent underperformance relative to market risk expectations. While differences in alpha between portfolios were marginal, the Article 9 fund portfolio had slightly less negative alpha compared to other classifications. These findings suggest that ESG classification alone did not explain superior or inferior performance, and the research hypotheses were not supported in this context.

This research offers empirical evidence on Finnish mutual funds in the SFDR framework and delivers a critical viewpoint of the financial benefits of sustainable investment products. Results are useful to investors, regulators, and asset managers who aim to understand the relationship between sustainability and profitability in the modern market.

KEYWORDS: SFDR, ESG, mutual fund, returns, risk-adjusted returns, Finland

VAASAN YLIOPISTO**School of Laskentatoimen ja rahoituksen yksikkö**

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Tiivistelmä:

Tämä tutkimus tarkastelee suomalaisten sijoitusrahastojen tuottoja ja riskikorjattuja tuottoja EU:n Sustainable Finance Disclosure Regulation (SFDR) -luokituksen valossa. Tutkimuksen tarkoituksena on selvittää, tarjoavatko korkeammin luokitellut rahastot (artikkelit 8 ja 9), jotka huomioivat ympäristöön, yhteiskuntaan ja hallintotapaan (ESG) liittyviä tekijöitä, parempaa sijoitustaloudellista suorituskykyä verrattuna perinteisiin artikkeli 6-rahastoihin. Aineisto koostuu Suomessa rekisteröidyistä osake-, yhdistelmä- ja korkorahastoista, joiden kuukausittaiset tuotot ovat saatavilla ajalta maaliskuu 2021 – marraskuu 2024. Analyysissä hyödynnetään useita mittareita, kuten kumulatiiviset tuotot, Sharpen luku, keksihajonta, CAPM sekä Jensenin alfa, ja tuloksia verrataan MSCI World -indeksiin, joka toimii tutkimuksen vertailuindeksinä.

Kaikilla portfolioilla oli tilastollisesti merkitsevä negatiivinen alfa CAPM-regressioissa, mikä viittaa siihen, että tuotot alittivat markkinariskin perusteella odotetun tason. Erot alfassa eri rahastoryhmien välillä olivat kuitenkin vähäisiä, ja Artikkelin 9 -portfolion rahastot tuottivat jopa hieman vähemmän negatiivisen alfan verrattuna muihin luokkiin. Näin ollen tulokset eivät tue oletusta siitä, että ESG-luokitus selittäisi ylivoimaista tai heikompaa taloudellista suorituskykyä, eikä tutkimushypoteeseille löytynyt tukea aineistosta.

Tutkimus tarjoaa empiiristä näyttöä suomalaisista rahastoista SFDR-kehityksessä ja tuo kriittistä näkökulmaa kestävien sijoitustuotteiden taloudellisiin hyötyihin. Tulokset ovat hyödyllisiä sijoittajille, sääntelijöille ja varainhoitajille, jotka pyrkivät ymmärtämään vastuullisuuden ja tuottavuuden välistä suhdetta nykyisessä markkinaympäristössä.

KEYWORDS: SFDR, ESG, mutual fund, returns, risk-adjusted returns, Finland

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Abbreviations

AUM	Assets Under Management
CAPM	Capital Asset Pricing Model
CPI	Consumer Price Index
COVID	COVID-19-pandemia
EMH	Efficient Market Hypothesis
ESG	Environmental, Social and Governance
ESMA	European Securities and Markets Authority
EU	European Union
GSIA	Global Sustainable Investment Alliance
ICI	Investment Company Institute
MSCI	Morgan Stanley Capital International (index)
MPT	Modern Portfolio Theory
NAV	Net Asset Value
SD	Standard deviation
SFDR	Sustainable Finance Disclosure Regulation
SRI	Socially Responsible Investing
US	United States
USD	United States Dollar

Introduction

A paradigm shift is taking place in the global financial landscape as investors give greater weight to ESG factors when making investment decisions. This revolutionary movement is particularly evident in Finland, where sustainable investing has become very popular recently. Sustainable mutual funds are at the pinnacle of this movement since they include ESG factors in their investing strategies to achieve not only financial returns but also positive social and environmental impacts. The aim of this study is to examine whether the EU's Sustainable Finance Disclosure Regulation (SFDR)-classified Article 8 & 9 mutual funds have yielded higher returns and risk-adjusted returns in comparison to Article 6 mutual funds in Finland. Previous studies have covered the effects of ESG integration on investment products, but the literature lacks information on how SFDR classifications correlate to returns and risk-adjusted returns. Under the EU's Sustainable Finance Disclosure Regulation, all investment products offered within the EU area are classified into one of three categories: Article 6, 8, or 9 funds. They force asset managers to share the different types of sustainability integration within an investment plan. In addition to preventing "greenwashing," which is the practice of some financial organizations falsely claiming that their products are sustainable, the SFDR is aiming to prevent that from happening (Robeco).

Socially Responsible Investing (SRI), which is a foundation for SFDR classifications, has grown in popularity globally for the past two decades. As its core objective, SRI connects investment decisions to ethical, environmental, and social values while aiming to accomplish competitive profits. This approach emphasizes the principle "doing good by doing right," where investors set the parameters of sustainable development as a priority without bargaining about the profit expectations. SRI strategies include negative and positive screening and impact investing, among other things. These strategies aim to answer global challenges such as climate change, social inequality, and corporate governance questions, while they try to define the role of funding in accomplishing sustainable development (Friede et al., 2015).

This research focuses on Finland for several reasons. Firstly, Finland is known globally as one of the frontrunners in sustainable investing. This position is based on Finland's long history of integrating sustainability into society and economy. For example, Global Sustainable Investment Alliance (GSIA) reports have repeatedly proven that Nordic countries, Finland among them, are in the leading position regarding the portion of sustainable investments compared to other areas. Additionally, Finnish investors have traditionally expressed high interest in ethical and eco-friendly investment solutions, which makes Finland an ideal target to examine sustainable investing (GSIA, 2023). The first Finnish mutual fund that was accepted as part of the World Pax Fund (referred to as the first sustainable fund) is the OP-Climate Fund, which was founded in 1997. From here on onwards, the popularity and selection of sustainable mutual funds have experienced vast growth in the past few years (Puttonen & Puttonen, 2021).

Finland is one of the few countries where the sustainable funding regulation, such as SFDR, has been put into action particularly comprehensively. The implementation of this regulation has made it possible for Finnish mutual funds to actively participate in developing innovative solutions to achieve sustainable development goals. For example, the Finnish banking sector has played a central role in defining the mutual fund sustainable criteria and developing the ESG metrics (Pohjola & Laine, 2022). The national sustainable development work in Finland implements the policies of the UN, EU, Arctic Council, and Nordic Ministry Councils, which proves the country's strong commitment towards sustainable development (Vastuullinen Suomi, 2024). Political and societal support for sustainable development has an effect on investment markets, making Finland an ideal target of examination for this kind of research.

The introduction of SFDR classifications has further strengthened the growth and differentiation of sustainable mutual funds in both Finland and the rest of Europe. Article 8 mutual funds are usually called "light green" mutual funds, and they promote environment- and society-related features, although their primary goal is not sustainability. Ar-

Article 9 mutual funds, so-called “dark green” mutual funds, however, aim towards sustainability goals such as reduction of carbon emissions or preserving biodiversity. This classification has encouraged asset managers to develop new products and widen their selection in a way that they meet the tight sustainability criteria. Because of this, investors now have even better opportunities to pick investments to match their values. Even though socially responsible investing and SFDR classifications are being discussed later in this research, it is important to recognize their significance in shaping the financial markets. The growing popularity of Article 8 and 9 mutual funds reflects a broader change, where the aim is to integrate sustainability into an integral part of investment strategies. These classifications promote transparency and sustainability within asset managers, which creates a foundation for a sustainable financial system (European Commission, 2019; Seneca ESG, 2023).

1.1 Purpose of the study

The purpose of the study is to examine the performance of SFDR article 9, 8, & 6 mutual funds in Finland and find out whether higher classification number correlates with better returns, and risk-adjusted returns. This research has great relevance since investors have a growing interest in sustainability. Investors are willing to participate in the fight against climate change and other urgent environmental and social issues, and it is crucial to study what kind of financial tools can help them maximize their profits along the way. This study compares the financial performance of SFDR Article 8 and 9 classified funds with article 6 mutual funds to better understand sustainable investing in Finland. It aims to evaluate the effects of regulatory frameworks like SFDR and offer empirical proof of how well ESG integration drives investor returns. The findings of this study, which show the variations in profitability between classified and non-classified funds, can help investors make more informed decisions. Furthermore, by using these findings, policymakers may improve the legal frameworks for sustainable finance and make sure that they effectively encourage the integration of ESG and transparency.

1.2 Limitations and assumptions

This study acknowledges a few potential restrictions that could affect the reliability and applicability of the findings. First off, lack of historical data may cause bias or uncertainty in the findings. Several assumptions are also made in this study to simplify the research procedure and enable analysis. The study relies on the supposition that the chosen financial indicators fairly portray the mutual fund industry's financial performance and serve as a barometer of shareholder profitability. Although these measures offer significant insights, it's possible that they don't cover all aspects of fund performance.

2 Mutual Fund Definition

Mutual funds are diversified investment vehicles that aggregate capital from various investors to invest in widely diversified portfolios. Mutual funds enable access for private investors to invest in diversified and professionally managed portfolios, which is useful for investors with limited resources or knowledge (Bodie, Kane & Marcus, 2018). Combining assets allows mutual funds to offer a diversified portfolio, which may include different categories such as equity, fixed income, and money market funds. Mutual fund types might differ in risk tolerance, goals, and market preferences (Elton et.al, 2014), and therefore they can deliver options for all kinds of investment needs and strategies (Investment Company Institute [ICI], 2023).

Figure 1. presents the global mutual fund market growth forecast between 2023 and 2033. In 2023 the global mutual fund market size was around 512.4 billion USD, and the market is expected to grow up to 12,300 billion USD by the end of 2033. Table 6 highlights the exponential growth during the 10-year period, which indicates increasing interest from investors and the expansion of the mutual fund market (Custom Market Insights, 2024).

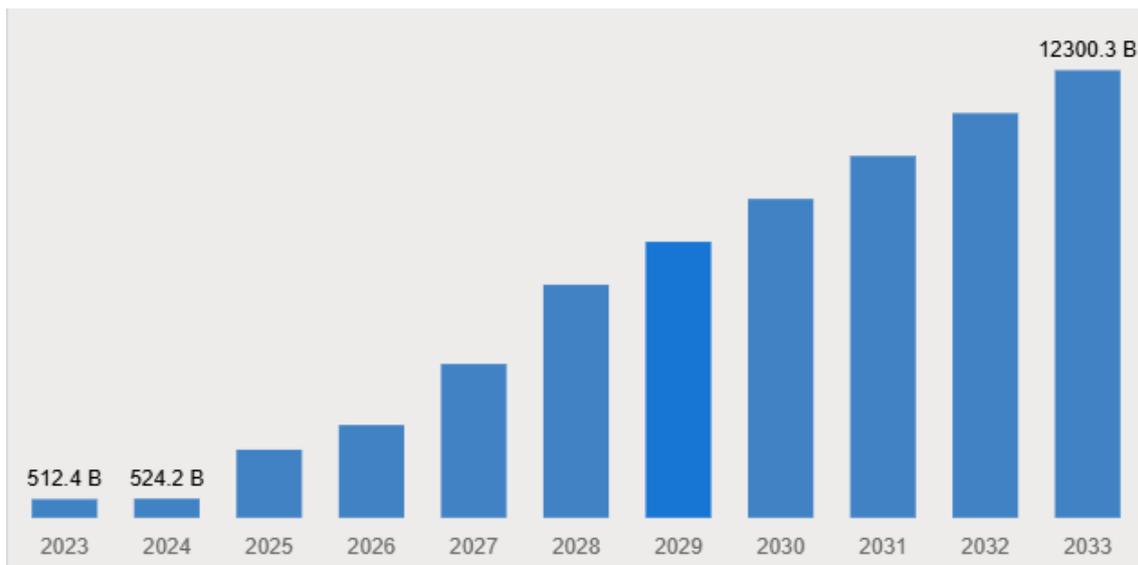


Figure 1. Global mutual fund assets market 2023 – 2033 by billion USD (Custom Market Insights, 2024).

2.1 Sustainable and conventional mutual funds

Sustainable mutual funds, known as ESG mutual funds, integrate sustainability criteria into their investment strategies. The goal for these mutual funds is to maximize returns while dealing with challenges related to the environment and society, such as reduction of carbon emissions, promotion of diversity, and ensuring good governance. According to SFDR classifications, these mutual funds can be divided into different article groups. With the growing interest in ethical investing, sustainable mutual funds attract investors who want to combine their economic goals with their own personal values (SFDR, 2019; Seneca ESG, 2023).

Conventional mutual funds focus primarily on traditional economic metrics, such as profitability and the growth of turnover, without taking ESG factors explicitly into account. These mutual funds aim to maximize their profits in different asset classes. Although some conventional mutual funds might include companies with strong ESG policies, this is not their main goal. Conventional mutual funds offer a wide selection of investment strategies and attract investors who are looking for competitive profits and diversification (Morgan Stanley, 2019).

The key difference between sustainable and conventional mutual funds is primarily their investment targets. Sustainable mutual funds combine ESG goals into economic performance, while conventional mutual funds focus solely on profits. Additionally, sustainable mutual funds often participate actively in ESG-theme-related impacting, such as shareholder voting, which is not as common in conventional mutual funds. However, challenges like greenwashing are still a problem for sustainable mutual funds (Raghunandan & Rajgopal, 2022).

2.2 NAV calculation and subscription & redemption process

Net asset value (NAV) of a mutual fund reflects the mutual fund's net value per share. It is calculated by subtracting liabilities from the mutual funds' total assets and dividing the result by the amount of mutual funds outstanding shares. This value is updated daily for it to reflect the changes in mutual funds' investments in market value. NAV serves as a basis for the pricing of mutual fund shares in subscription and redemption situations (Morningstar, 2023).

The subscription of mutual fund shares means buying new shares from the mutual fund. The investor makes subscriptions by buying the amount of his choice to the mutual fund account and delivering the necessary information for the fund management company. Subscription orders are usually processed during banking days, and they have fund-specific cut-offs. For example, subscription orders received before 12.00am are executed for the same day value. The minimum values and cutoffs for subscriptions may vary depending on the mutual fund (SEB, 2023).

The redemption of mutual fund shares means selling the shares back to the mutual fund. Investors may place redemption orders, for example, through an online bank by choosing the number of shares or the euro (or other currency) amount. Redemption orders are executed usually according to mutual fund rules; they also have their own cut-offs. For example, redemption orders made before 12am are executed for same-day value, and money is withdrawn to customers' accounts in a few banking days. It is important to note that both subscriptions and redemptions may involve costs such as subscription and redemption fees, which vary within mutual funds. Investors must carefully get to know mutual fund rules and terms before making orders to ensure that they are aware of possible fees and cut-offs (S-Pankki, 2023).

2.3 Investor behavior

Investor behavior is another important research subject in the functionality of mutual funds, for it has significant impacts on the mutual fund cash flow and the stability of the whole market. Ben-David et.al (2022) research the behavior of mutual fund investors, and they question a traditional perception that investors would constantly track fund managers skills to produce profits. Instead, researchers claim that mutual fund investors follow only simple performance signals such as overall profits, which may channel cash flows regardless of fund managers skills to produce excess returns (Ben-David et.al, 2022). This behavior model indicates that mutual fund investors might place recent performance ahead of long-term consistency, which usually leads to more reactive rather than strategic investment decisions.

Investor behavior has an integral role in the dynamics of financial markets, affecting both the stability of markets and the direction of cash flows. Sirri & Tufano (1998) noticed that mutual fund investors often portray a strong tendency to favor mutual funds with an excellent previous profit history. This tendency channels cash flows strongly towards “winning funds,” while “loser funds” end up with less attention. This unsymmetric reaction highlights behavioral biases such as recency bias, where investors put too much emphasis on recent figures at the expense of long-term performance. Although this behavior may increase capital flows of top-performing mutual funds, it might also increase market volatility and lead to ineffective capital allocation since underperforming mutual funds might be left unnoticed even though their foundation was strong. These observations stress the meaning of psychological factors in investment decisions and the risks they might cause in the broader financial system (Sirri & Tufano, 1998).

Demographic factors also have a significant effect on the behavior of mutual fund investors, which increases the complexity of market dynamics. Barber & Odean (2001) examine the behavior of private investors and notice that individual characteristics such as age, gender, and economic literacy have a significant effect on investment decisions. For example, younger and economically conscious investors are usually better prepared to

invest in equity-weighted mutual funds, whereas older investors usually prefer more conservative, fixed-income-weighted mutual funds. There are also significant differences between genders: men are more inclined towards active trading, which often reduces their profits, whereas women express more careful and consistent investor behavior, which leads to a better long-term profit. These observations point out that investor behavior cannot be generalized, for it is affected by a complex combination of personal, psychological, and external market factors (Barber & Odean, 2001).

2.4 Mutual funds in Finland

The Finnish mutual fund market has experienced significant growth and development during the past few years. According to Finance Finland, over 9 billion euros worth of new capital was invested in Finnish mutual funds in 2024, which lifted the overall fund capital value to 185 billion euros at the end of December 2024. This growth underlines strong confidence in markets from investors and their interest in diverse investment instruments. The growth of fund capital is especially significant considering the economic challenges of the past years, such as the rise in inflation and the geopolitical crisis, which has affected the markets. However, in Finland, mutual funds have proven resilience and the ability to tempt new investments, which makes them an integral part of the country's investment field (Finanssiala ry, 2024).

Statistics Finland reports that at the end of 2022, mutual funds were owned by 27.8% of the Finnish population, which means nearly every third Finn. The number of mutual fund investors has grown steadily over the past decade, which highlights the increased popularity and accessibility of mutual funds. The popularity can also be witnessed in the demographic distribution of mutual funds for young people, and people living in cities have increased their activity. The median value of mutual fund holdings, however, was only 5400 euros, which fell by almost a fifth in real terms from the previous year. This decline can partly be explained by market volatility, but it also highlights that many investors are still cautious, and the average size of investments stays relatively small (Tilastokeskus, 2023).

According to Finland's Bank statistics, Finnish mutual funds have diversified their investments in different asset classes such as fund shares, stocks, and bonds. This diversification is an important part from the risk management point of view because it reduces the impact of sporadic market shocks and offers wider opportunities to make better profits. Particularly, the share of equities in Finnish mutual funds has long been growing, which indicates investors and asset managers are willing to capitalize on the long-term potential offered by the stock markets. This development highlights the significance of mutual funds from the perspective of economic stability and growth potential (Suomen Pankki, 2024).

The Financial Supervisory Authority, on the other hand, publishes monthly statistics about fund management companies' market shares, offering an in-depth view of the competitive situation in the industry. The centralization of markets has gradually reduced, and larger operators face more and more competition from smaller and more specialized fund management companies. This progress benefits investors because it increases selection and enables better cost efficiency. The classification of mutual funds according to SFDR classifications, for example, has brought new opportunities in the field of sustainable investing, which has increased interest towards Finnish mutual funds domestically as well as internationally (Finanssivalvonta, 2024).

Figure 2. presents total net assets of funds domiciled in Finland between 31.1.2019 and 31.1.2024. Assets are divided into five different categories: equity, balanced, fixed income, short-term fixed income, and alternative investment funds. Total net assets reflect a general growing trend by reaching around 152.7 billion euros in January 2024. In mutual fund development, significant growth can be witnessed, especially with equity and fixed-income funds, which indicates a growing interest from investors towards these mutual funds. Balanced funds, for their part, have kept steady growth, highlighting their popularity as a provider of diversified investment strategies. Short-term fixed income funds and alternative investment funds are relatively smaller fund classes, but they have also grown steadily.

The downturn witnessed in the beginning of 2020 mirrors the impact of the Covid-19 pandemic on global markets. Economic recovery post-Covid is clearly visible in all fund classes, especially in equity and fixed-income funds, which portray significant growth after 2020.

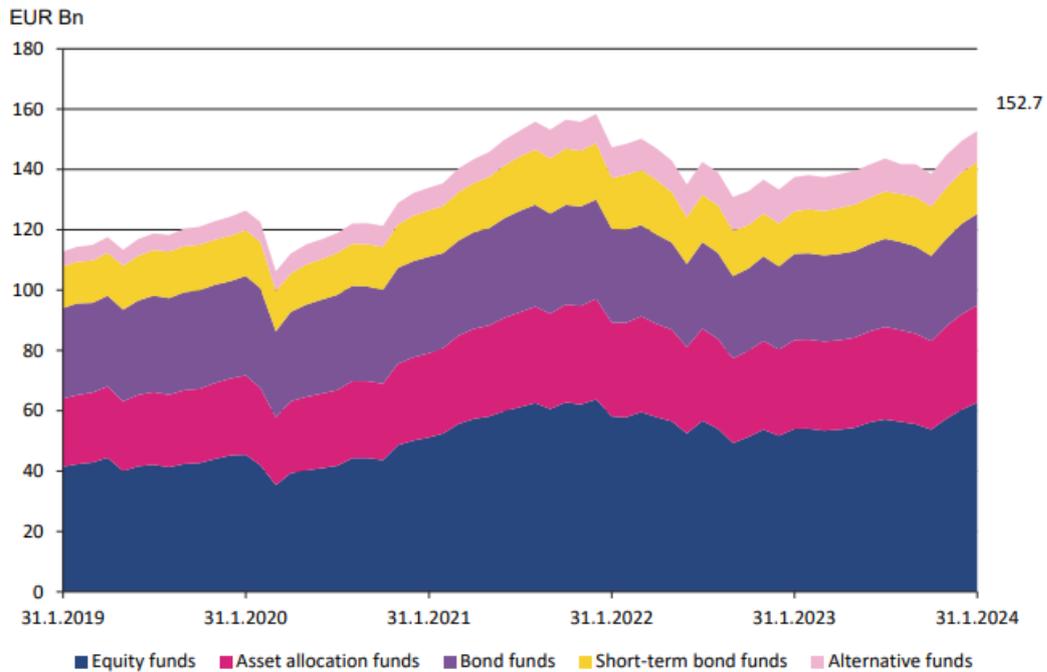


Figure 2. Total net assets of funds domiciled in Finland from 31.1.2019 to 31.1.2024 (Investment Research, 2024).

3 Theoretical Background

This chapter presents the relevant theories and concepts supporting the empirical part of the research. At the beginning, efficient market theory and portfolio theory are discussed, forming a foundation for understanding the relationship between asset class pricing and risk and return. After that, theories related to sustainable investing, such as ESG, SRI, and SFDR, are examined.

3.1 Efficient market theory

The efficient market hypothesis (EMH) is one of the essential theories in economics and finance, and the theory argues that financial markets are informatively efficient. This means that all relevant information reflects immediately and correctly on stock markets, which leads to a situation where excess profits cannot be made. The famous proponent of the theory, Eugene Fama (1970), presented EMH by dividing it into three forms: weak, semi-strong, and strong. Weak form argues that historical data cannot help predict future profits, semi-strong form covers all the available public information, and strong form includes all the insider information (Fama, 1970).

The research conducted by Burton and Malkiel (2003) discussed EMH criticism widely and mentioned that even though market efficiency is the baseline, there is a wide range of anomalies to challenge the theory. For example, market phenomena such as the January effect or the small company effect deviate from the EMH theory assumptions. However, Malkiel mentions that the magnitude of these exceptions is rarely so significant that they would crush the efficiency hypothesis completely (Malkiel, 2003).

Andrew Lo (2004) introduced a new approach next to EMH: Adaptive Markets Hypothesis (AMH), where market efficiency is seen as dynamic and dependent on the adaptability of market participants. AMH connects EMH and perspectives from behavioral science and argues that markets are not statically efficient; rather, the efficiency changes with

evolutionary adaptation by market participants. According to Lo, efficiency is most likely temporary and situational, and it varies in time according to market conditions (Lo, 2004).

3.2 The Modern portfolio theory

Modern Portfolio Theory (MPT), which was invented by Harry Markowitz, is one of the most significant financial theories in the history of finance. MPT's key principle is to create an optimal portfolio where an investor can maximize his expected returns by diversifying investments with a certain risk level. Markowitz (1952) is the first to present a mathematical model where it is possible to optimize a ratio between risk and return with standard deviation and expected returns. He posits that a properly diversified portfolio may reduce a portfolio's overall risk without compromising expected returns. William Sharpe's (1964) work with the Capital Asset Pricing Model (CAPM) deepened the foundation of MPT. CAPM brought a new dimension to MPT by pointing out that portfolio risk can be divided into market risk and company-specific risk. Sharpe's CAPM is still an essential tool to examine investments risk-return ratio.

Eugene Fama and Kenneth French's (1992) research, "The Cross-Section of Expected Stock Returns," broadened MPT even further by bringing new factors to explain stock market profits combined with market risk. Their multifactor model proved that company size and valuation have an effect on the stock market profits. This was a significant improvement, because traditional CAPM couldn't explain all the possible differences in profits. Fama and French's research was also an essential part of the development of so-called factor-investing thinking, and their multifactor model is still widely in use to support investment decisions.

3.3 Sustainability

3.3.1 ESG

ESG factors have become an essential part of the financial sector and investment strategies because investors and corporations strive to combine sustainability and economic goals. The goal for ESG integration is to recognize risks and opportunities in investment decisions related to the environment, social factors, and governance. In general, it has been noticed that ESG factors enhance economic performance and reduce risks, which has increased their significance in investment decisions.

Figure 3. portrays that ESG funds had 7.8 billion US dollars' worth of assets under management in 2021. In three different growth scenarios to 2030, the number of ESG funds covers 18% of all funds, and AUM reaches 20 billion US dollars in the low-growth scenario. In the mid-growth scenario, the number of ESG funds rises to 45% of all funds, and their AUM is worth 25 billion US dollars. The high-growth scenario predicts ESG funds to cover a 60% share of all funds in the market and manage assets up to 30 billion US dollars by the end of the decade.

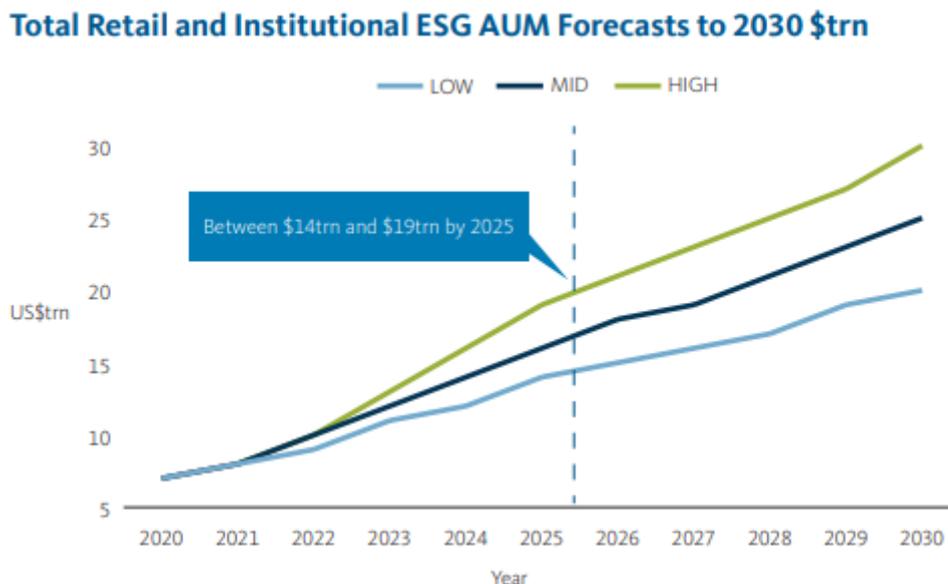


Figure 3. Total Retail and Institutional ESG AUM Forecasts to 2030 trillion USD.
(Broadridge Financial Solutions (2023, p. 4).

A growing number of investors aim to achieve ESG goals such as reduction of carbon emissions and promotion of social responsibility. Investors also require specific and comparable information to support decision-making, and that's why the availability and reliability of ESG information are essential. ESG strategies are evolving from simple risk management towards significant sustainability scores promoting strategic goals. The key factors in this transition are the quality and standardization of ESG data, as they can either speed up or slow down the growth of ESG investments. (Broadridge Financial Solutions, 2023, p. 5)

Figure 4. portrays ESG fund net flows in billion US dollars from 2011 to September 2021 across major geographical areas. ESG fund net flows have increased significantly, especially from 2019 onwards, and this growth is particularly strong in Europe.

ESG Fund Net Flows \$bn

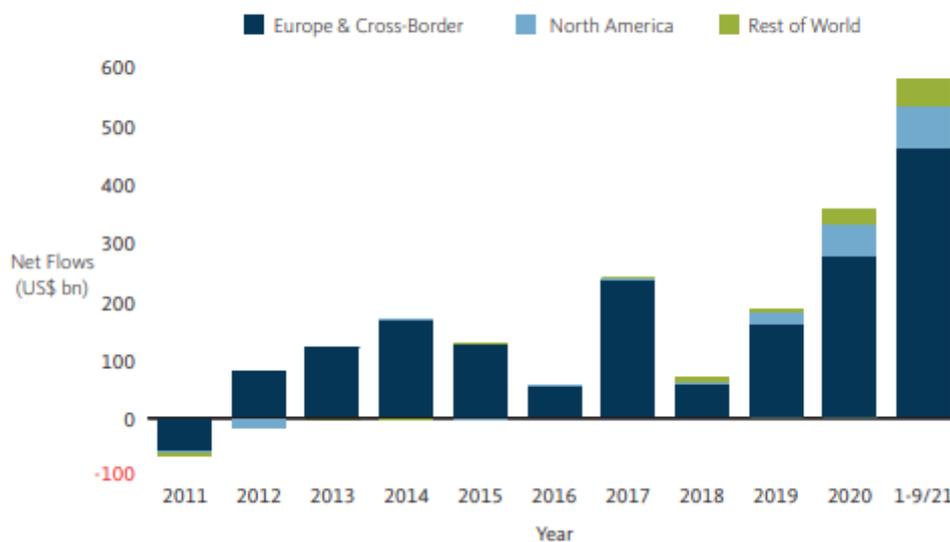


Figure 4. ESG Fund Net Flows in billion USD (Broadridge Financial Solutions, 2023, p. 5).

Friede, Busch and Bassen (2015) offer a comprehensive meta-analysis of over 2000 studies, which examine the connection between ESG and economic performance. Their research indicates that ESG integration most likely leads to positive or neutral economic performances, which supports the idea of including ESG factors as part of investment

strategies. The scope of the meta-analysis supports Friede, Busch and Bassen's findings, and their results indicate that ESG integration may act as an economically productive strategy without significant cuts of losses (Friede, Busch, & Bassen, 2015).

Giese, Lee, Melas, Nagy and Nishikawa (2019) deepen the understanding of the impact of ESG factors on stock valuation, risk, and overall performance. Their research points out that strong ESG reviews are usually connected to smaller risk and higher profitability. Therefore, ESG factors have economic benefits, which assist investors in better reviewing the risk and opportunity of the target company. The impact of ESG has reduced stock market volatility and increased companies' resilience in times of market changes (Giese et al., 2019).

Schoenmaker and Schramade (2019) examine ESG's significance in the wider scope of sustainable finance. According to them, the application of sustainable finance principles demands that ESG factors are systematically considered in investment strategies. Their research highlights ESG's role in risk management and emphasizes that ESG factors may act as an effective tool to reduce social and environmental-related risks (Schoenmaker & Schramade, 2019).

Eccles, Ioannou and Serafeim (2014) investigate the impact of corporate sustainability policies on the actions and results of their organization. Their empirical research indicates that strong sustainability policies improve corporations' economic performances by improving processes and shareholder relationships. According to their research, companies with comprehensive ESG policies demonstrate enhanced productivity and resource efficiency, which then leads to improved economic results in the long term. Their research also highlights the importance of ESG in strengthening the company's reputation and competitiveness (Eccles, Ioannou, & Serafeim, 2014).

3.3.2 Socially responsible investing

Socially Responsible Investing (SRI) is an approach where, besides economic goals, ESG-related views are taken into consideration. This approach has reached an integral part in financial markets when investors have started to value responsibility and perseverance in their investment strategies. SRI does not only aim to offer competitive returns but also channel capital into such targets that promote sustainable development and responsible action (Eurosif, 2021). SRI strategies can be classified into various approaches, such as negative and positive screening and impact investing. The aim for these strategies is to combine economic profitability and sustainability in a way that matches investors values while creating positive changes in society and the environment (Eurosif, 2021).

Negative screening means excluding fields or companies from the investment universe if their business has a conflict with investor values or sustainable development goals. Typically, fields facing negative screening are, for example, the production of fossil fuels and the tobacco and arms industries. This approach aims to mitigate the negative impact of investments and steer capital flows towards sustainable targets. Even though negative screening has faced criticism for its limiting nature, research points out that it can also enhance investment risk management, for many excluded fields are prone to significant regulation and market risks (Rennenboog et.al., 2008).

Positive screening, on the other hand, focuses on recognizing and choosing companies that signal a strong commitment to ESG practices. Positive screening highlights, in particular, companies' ability to integrate sustainability into part of their business strategy while making competitive profits. In this approach, investors review companies ESG indicators and emphasize sectors and companies that are frontrunners in sustainability. Empirical research has shown that positive screening might increase the long-term value of investments, for strong ESG practices are usually connected to a better risk management and innovativeness (Friede et al., 2015).

Impact investing is one of the newest forms of SRI-strategies and its goal is to create measurable positive societal and environmental impacts together with economic profits.

This approach is especially popular in industries such as renewable energy, microfinancing, and education, where the impact of investments can be concretely measured. The popularity of impact investing has grown remarkably during the past few years, partly because investors are more and more aware of global challenges such as climate change and inequality. Even though impact investing is a promising concept, reliable metrics and the development of standards to measure impact consistently remain a challenge (GSIA, 2020).

SRI has developed from a marginal approach into one of the most essential investment strategies in the global financial markets. The Global Sustainable Investment Alliance (GSIA) estimates that the amount of sustainably managed assets was around 35.3 billion USD in 2020, which represents 36% of total managed assets. This growth highlights the increasing interest from investors in sustainability and the impact of regulation, such as the European Union's SFDR framework, in integrating responsible investing as part of financial markets. The growing significance of SRI sets new challenges and opportunities for investors as well as asset managers (GSIA, 2020).

While SRI offers clear benefits like better risk management and integration of ethical values into investment activity, it also requires more precise evaluation and transparency when applying ESG criteria. This makes the subject a particularly important part of modern economic research, especially in a country such as Finland, where the goals of sustainable development are in the central position. The interest of Finnish investors in SRI strategies has increased significantly, and many Finnish mutual funds have proceeded to apply ESG criteria as a part of their investment decisions. This trend helps in reaching the goals of sustainable development but also supports the mutual funds' long-term success by offering better risk management and stronger relationships with sustainable companies (Puttonen & Puttonen, 2021).

3.3.3 SFDR articles

The European Union Sustainable Finance Disclosure Regulation (SFDR) classifies financial products into three main categories based on their sustainability-linked goals: article 6, article 8, and article 9. Each one of these classifications defines levels on different requirements for investment products based on environmental, social, and governance-linked factors.

3.3.3.1 Article 6

Article 6 consists of all the financial products that do not particularly promote environmental or societal-related matters, nor do they aim to make sustainable investments (SFDR, 2019). However, these products are subject to disclosure regulation, according to which providers of financial services are obligated to report how sustainable risks are being considered in investment decisions or, alternatively, justify why these risks are not included in their strategies (European Commission, 2019). This regulation increases transparency in the financial markets and helps investors to understand how possible sustainability risks, such as the effects of climate change or social conflicts, may impact investment profits.

Even though Article 6 products do not actively pursue sustainability goals, their reporting disclosure highlights the meaning of responsibility also in more traditional investment products. Therefore, those mutual funds that do not meet the demands of Articles 8 or 9 must consider the possible effects of sustainability risks. This regulation serves as an important foundation for financial markets' progress towards responsibility, for it sets the sustainability aspects in the center of conversation also in traditional investment products. For example, many Article 6 mutual funds have started to integrate ESG factors partly to enhance their competitiveness or due to growing demands from investors (Seneca ESG, 2023). Additionally, Article 6 operates as a foundation for more sustainable strategies. Many mutual funds that are part of this category may in time move to fulfill the demands of article 8 and 9 when ESG integration becomes an even more important

part of their investment strategies. This proves that even more traditional investment products may eventually adopt features that promote responsibility (European Commission, 2019).

3.3.3.2 Article 8

Article 8 includes financial instruments that promote environmental or socially related attributes or a combination of them, but their primary goal is not sustainability (SFDR, 2019). These mutual funds are often called “light green” funds, and they include investments in companies that meet the defined ESG characteristics. Article 8 mutual funds must clearly offer transparent information about how these ESG characteristics promote sustainability, and they must regularly report the progression of their goals (European Commission, 2019). Operational models of these mutual funds may vary significantly because their level of ESG integration is not as tightly regulated as Article 9 mutual funds. For example, Article 8 mutual funds may use negative screening, where certain industries are being excluded from the investment portfolio. At the same time, they may emphasize investments in companies that meet the high ESG standards or that have strong responsibility strategies. This makes Article 8 mutual funds a flexible option for investors who wish to combine responsibility and profit expectations without tight restrictions (Seneca ESG, 2023).

Even though Article 8 mutual funds also include investments that do not directly promote sustainability, mutual funds may still demonstrate how these investments support the general ESG goals of the mutual fund. This might increase investor trust, but at the same time it opens doors for possible greenwashing if these goals are not met as expected. Therefore, Article 8 mutual funds reporting obligation is an essential tool for investors decision-making (Apiday, 2023).

3.3.3.3 Article 9

Article 9 includes financial instruments whose primary goal is to make sustainable investments (SFDR, 2019). These are often called “dark-green” mutual funds, and they aim for specific sustainability goals such as mitigation of climate change, restoration of biodiversity, or promotion of social justice. Article 9 mutual funds must follow precisely the criteria of sustainable investments and the “do no significant harm” principle, which guarantees that the operation of the mutual fund does no harm to other parts of sustainability (European Commission, 2019).

Article 9 mutual funds differ significantly from other SFDR classifications because their investment operation must be based on measurable sustainability goals. For example, mutual funds that aim for the reduction of carbon emissions may focus on renewable energy projects or companies that are leading operators in eco-friendly solutions. These mutual funds do not only promote sustainable development, but they may also lure investors who appreciate sustainability among economic profits (Seneca ESG, 2023). Additionally, Article 9 mutual funds need to make sure that their target companies follow the principles of good governance, such as transparency and ethical business practices. This increases the attractiveness of mutual funds, especially among institutional investors who are looking for investment targets that meet the high responsibility standards. Although the management of Article 9 mutual funds can be complicated due to tight criteria, they represent the highest standard of responsible investing (Apiday, 2023).

3.3.4 Studies and research on SFDR classifications

Busch & Bassen (2021) evaluate SFDR's basic goals and impacts in sustainable finance markets. According to them, the endeavor of regulation to increase transparency may encourage people to act towards more sustainable decisions. SFDR also aims to prevent greenwashing or exaggeration of investments sustainability. The research also brings forward the challenges of regulation: interpretation of SFDR instructions and inaccuracy of

certain concepts have caused confusion, which may lead to differences in interpretations between market parties (Busch & Bassen, 2021).

Preiner & Brauneis (2022) focus especially on the prevention of greenwashing in their article. According to them, SFDR is the first regulatory framework to place concrete demands on the accuracy and transparency of sustainability claims. Greenwashing has been a significant problem, for numerous investment products may have exaggerated their environmental and social impacts to lure more sustainability-oriented investors. Preiner & Brauneis claim that SFDR requirements may drastically improve the reliability of investment products communication. However, they also consider whether the current requirements of regulations are enough to prevent greenwashing comprehensively or whether even stricter reporting requirements would be necessary (Preiner & Brauneis, 2022).

SFDR classifications, especially articles 8 and 9, define under which conditions investment products may use sustainability claims. Kölbel & Lambillon (2023) examine practical applications and criteria challenges of these articles. Article 8 refers to investment products that promote sustainability goals, while Article 9, on the other hand, is aimed at products with a primary objective of reaching sustainable impact. Kölbel & Lambillon (2023) point out that the enforcement of SFDR classifications has been challenging, and interpretation of the criteria has caused confusion about which products can be labeled as sustainable. For many investment companies, complying with SFDR classification has proved to be complicated and has required a significant amount of resources.

3.3.5 SFDR in numbers

Research conducted by Maples Group (2024) analyzed the European sustainable investing landscape according to the SFDR framework, and this observation highlights the growing importance of ESG-based mutual funds. Over 26,000 mutual funds were examined in Luxembourg and Ireland, and research points out that 28% of mutual funds were

classified as either Article 8 or 9 based on SFDR classifications. This is illustrated in figure 5. Below.

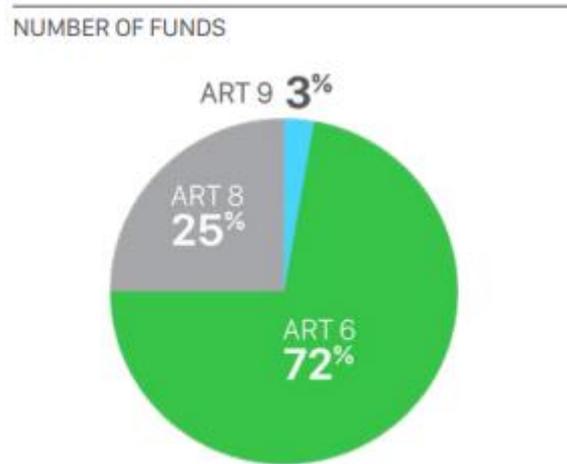


Figure 5. Number of Mutual Funds by SFDR Classification (Maples Group, 2024).

Figure 6. provides information on the distribution of assets under management (AUM) according to SFDR classifications. 61% of assets belong to Article 6 mutual funds, and 39% belong to Article 8 & 9 mutual funds.

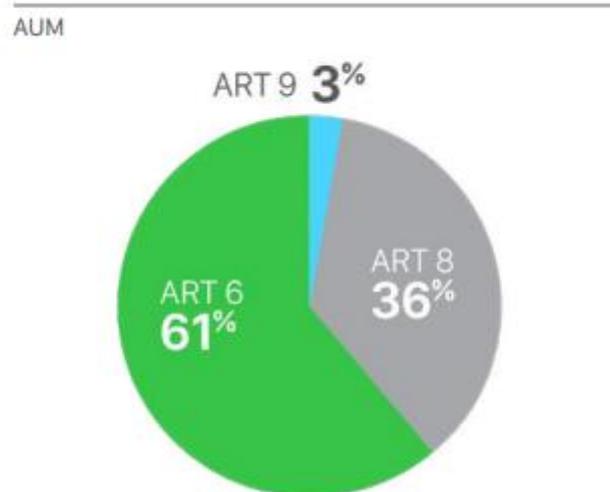


Figure 6. Distribution of AUM according to SFDR classification (Maples Group, 2024).

The number of Article 8 & 9 mutual funds has grown by over 20% in a year, which suggests a strong trend in sustainable investments. The growth is even more notable in the establishment of new mutual funds, where over 51% of new mutual funds in Europe were classified as either Article 8 or 9.

4 Literature review

In this chapter I will discuss the relevant literature on mutual fund performance with an emphasis on the ESG aspect and comparisons between ESG-related and conventional mutual funds. Later in this chapter I will also talk about mutual fund performance in Finland.

4.1 ESG and mutual fund performance

The integration of ESG factors into investment decisions has been a significant trend in financial markets, and its impact on the economic performance of mutual funds has generated wide interest. Friede, Busch & Bassen (2015) execute a comprehensive meta-analysis that combines results from over 2000 empirical studies. Their analysis indicates that there is mainly a positive or neutral relationship between ESG factors and economic performance. A large portion of studies did not detect a negative correlation between ESG and profits, but the correlation was mostly positive. Moreover, Whelan et.al (2021) analyzes over 1000 studies that examined the relationship between ESG and economic performance between 2015 and 2020. Their analysis points out that the majority of research reports a positive connection between the two factors. This indicates that the application of responsible criteria is not only ethical, but it may also increase the long-term profits of corporations and mutual funds. Particularly corporations that manage to apply ESG strategies successfully may tempt new investors more easily, reduce regulation risks, and improve operational efficiency.

Suresh & Thomas (2023) examine the integration of ESG factors into mutual funds and its impact on economic performance and risk management. According to their research, considering ESG factors in investment decisions enhances the economic performance of mutual funds and offers more effective ways to control investment-related risks. The advantage of ESG integration is that it might help to reduce exposure to environment- or society-related risks, which may significantly affect the long-term valuation of investments. Research also proved that the usage of ESG criteria in investment strategies can

increase investor confidence and improve the reputation of mutual funds. This highlights the potential of ESG integration, especially to investors who search for both responsible and profitable investment opportunities. ESG strategies may also enhance the diversification of investments, which helps to minimize the risks caused by the market instability (Suresh & Thomas, 2023).

The European Securities and Markets Authority (ESMA) analyzes the profits of ESG-focused equity funds for the past five years, covering several market areas. Research points out that ESG integration improves profits and reduces costs long-term, which makes it a tempting option for many investors. In the European markets, ESG mutual funds achieved a 1.59% annual profit margin on average, whereas the profit margin in the Asia-Pacific area was 1.02%. Annual profits in North America and the global markets grew more modestly, around 0.13-0.17%. These results indicate that ESG mutual funds may offer competitive profits while they support the goals of sustainable development. Additionally, it is noted that ESG integration brings advantages in market scenarios where risk management is being emphasized, which increases the mutual fund's attractiveness, particularly for long-term investors (ESMA, 2022).

One of the key aspects in the evaluation of sustainable mutual fund performance is their risk-adjusted profit. Morgan Stanley Institute for Sustainable Investing (2019) analyzes the performance of sustainable mutual funds and conventional mutual funds between 2004 and 2018. Results point out that sustainable mutual funds have as high or higher median returns in all examined asset classes. Additionally, their risk (especially during recession) was lower compared to conventional mutual funds. This observation highlights the potential of sustainable mutual funds to offer not only competitive profits but also more stable investments, which have better tolerance for market fluctuations. This will make them a more tempting option for risk-aware investors, who are searching for stable yet sustainable investments.

Nandita Das et al. (2018) study the risk-adjusted profits of socially responsible mutual funds from the past 12 years, between 2005 and 2016. In the research, they analyze how different ESG classifications affect the performance of mutual funds during economic crises. Results point out that mutual funds with high ESG classification made better profit compared to mutual funds with low ESG classification, particularly during economic crises. This indicates that mutual funds with high ESG classification may offer better protection against market fluctuations, making them an attractive option for risk-aware investors. Additionally, research highlights that these funds do not only survive better during crisis times, but also their long-term stability is a remarkable advantage. This supports the idea that responsible mutual funds may offer both competitive profits and sustainable risk management (Das et al., 2018).

Although ESG integration may enhance the performance of mutual funds, ESG controversies might degrade their efficiency. Petridis et.al (2023) examine the impact of ESG controversies on mutual fund performance during the COVID-19 pandemic. Their research focuses on mutual funds with low ESG controversy scores. Results point out that these kinds of mutual funds performed better during the recession caused by the pandemic. This indicates that effective control of ESG risks does not only support the long-term performance of mutual funds but also enhances their ability to survive during market crises. Therefore, avoiding controversies might be the key for retaining investors' trust and mutual fund reputation.

ESG ratings are important to investors who want to pick sustainable investments. Zhang et.al (2023) investigate the usage of ESG ratings on the optimization of investment strategies. They applied the reinforcement learning model, which combines economic and ESG goals. Their method helps investors to navigate through ESG-investing uncertainty, such as comparison and accuracy of different ESG factors. Zhang et.al (2023) research indicates that ESG factors may have a significant role in portfolio optimization, especially when investors aim to accomplish balance between sustainability and profitability.

4.2 Sustainable vs conventional mutual fund performance

Statman & Glushkov (2009) noticed that portfolios with high governance scores yield positive abnormal returns. This indicates that investors may accomplish their ethical goals without compromising financial profits. Similarly, Kempf & Osthoff (2007) report that investment strategies with a high emphasis on ESG ratings yield significant abnormal returns in comparison to conventional mutual funds. Besides these observations, some of the research mentions that sustainable mutual funds do not always exceed conventional mutual funds in terms of profits. This might be a result of the costs related to ESG strategies and limitations of investment options. It is clear, however, that ESG investments may offer competitive profits, especially when sustainability factors correlate with long-term financial success factors.

The risk profiles of sustainable mutual funds are an important research subject. Morgan Stanley Institute for Sustainable Investing (2019) analyzes nearly 11,000 mutual funds between 2004 and 2018 and identifies that the risk of sustainable mutual funds is lower on average compared to conventional mutual funds. Particularly sustainable mutual funds turn out to have better protection against market downturns. This affiliates with the fact that sustainable mutual funds emphasize corporations with strong governance, lower environmental risks, and better social relationships. Nofsinger & Varma (2014) support this observation in their research, where they analyze the performance of socially responsible mutual funds during market crises. Their study indicates that sustainable mutual funds enjoy better success during market downturns in comparison to conventional mutual funds, which makes them more tempting to investors who are looking for more stable investments. One possible explanation is that ESG-weighted corporations are usually better prepared to manage crises and operational disturbances. During upturns, conventional mutual funds might, however, yield higher profits due to their usage of more risky asset classes. This indicates the performance of mutual funds is relative to economic cycles, and investors should consider macroeconomic factors while making ESG investments.

The performance of sustainable and conventional mutual funds varies notably between regions. Leite & Cortez (2015) investigate European mutual funds and note that sustainable mutual funds did not significantly underperform against conventional mutual profits. However, their research indicates that the success of ESG strategies is dependent on regional market environments like regulation and investors awareness of ESG matters. The European markets are forerunners of sustainable investments because the region has a strong regulatory framework like SFDR and higher ESG awareness. For example, this differs from the US market, where ESG investments are only becoming more widely part of mainstream investing. Understanding regional differences is crucial for investors who wish to evaluate the performance of sustainable mutual funds in different markets.

4.3 Mutual fund performance evaluation through alpha

Several empirical studies have used the CAPM-model-based alpha to evaluate mutual fund returns relative to market returns. Bollen (2007) examines the performance of US sustainable mutual funds and notices that these funds did not have consistent positive alphas compared to traditional market indices. Based on the regression analysis, Bollen concluded that investors investing in ethical mutual funds do not necessarily pursue excess returns but value other characteristics such as ethical selection criteria or social impact. Bauer, Derwall & Otten (2007) present a similar approach to analyze the performance of socially responsible mutual funds in the US and Europe. The research uses both CAPM and multi-factor models to estimate alphas. The research points out that sustainable mutual funds underperformed during the early years of the examination period but, in time, improved their performance, accomplishing a comparable level with conventional mutual funds.

Nofsinger & Varma (2014) also apply CAPM regression to compare returns of sustainable mutual funds in different economic cycles. Their analysis indicates that sustainable mutual funds produce positive and statistically significant alpha during times of crisis but

underperform during more stable times. This kind of trend dependent on the return profile indicates that sustainable mutual funds may serve as some sort of protection against market risks.

4.4 Mutual fund performance in Finland

According to a study from Finance Finland, Finnish mutual funds have made significant profits for long-term investors between 2006 and 2021. The study examines €100 monthly installments to Finnish mutual funds, and the results point out that especially balanced funds with a global scope and mutual funds investing in Finnish markets have gained strong profits during the examination period. For example, balanced funds have profited from the stability offered by international diversification, whereas domestic equity funds have had higher profit expectations but also higher exposure to market disruptions. However, it is clear from the results that the development of mutual funds has not been stable, and market fluctuations have impacted their performance. During the financial crisis, values from both equity and balanced funds decreased drastically, highlighting the meaning of risk management in investment strategies. On the other hand, market recovery after the crisis has been strong, and the long-term profit averages of mutual funds have stayed positive. This comparison proves that mutual funds with global diversification offer more stable profits, whereas domestic mutual funds might yield higher profit, but they are more exposed to local economic risks (Finanssiala ry, 2022).

Fund characteristics such as size, age, and fees are crucial factors that have an impact on investors' profits. Korkeamäki & Smythe (2004) noticed that larger mutual funds in Finland succeeded better compared to smaller mutual funds due to lower fees and costs. Larger mutual funds have economies of scale, which enable lowering costs such as management fees. This increases investors' net profits. Mutual fund age, on the other hand, is connected to stability of performance. Older mutual funds tend to have longer periods of action, which may refer to established strategies and experienced portfolio managers. This is well covered in the research, where, on average, the performance of older mutual funds was superior in comparison to more recently established mutual funds. Besides

this, the strategy of the mutual fund, such as emphasizing stocks or broadness of diversification, was a significant factor that had a direct impact on the performance of the mutual fund.

One of the key questions among investors is whether the previous performance of the mutual fund can be used to predict its future profits. Lehtinen & Puttonen (2008) examine the performance continuity of Finnish mutual funds and perceive that the previous success of mutual funds is not significantly permanent. This means that successfully performing mutual funds do not necessarily continue their good performance in the future. Results are in line with the international studies, which indicate that the long-term success of mutual funds may be more dependent on the market environment than on portfolio managers' skills. Based on this, investors should be careful when assessing mutual funds solely based on their profits and pay attention to other factors, such as mutual fund strategy and cost structure.

Market conditions play a crucial role in the success of mutual funds. Cuthbertson, Nitzsche & O'Sullivan (2010) observe that, not surprisingly, mutual funds have better success in market upturns compared to market downturns. During market upturns, the strong progress of the stock market especially supports mutual funds with large stock emphasis. During downturns, mutual funds, like mostly all the other investment classes, experience notable challenges like valuation depreciation. This can be noticed especially in Finland. Due to its small and open economy, global market trends and economic cycles have a particularly powerful effect on the local mutual fund performance. This highlights the portfolio managers' skill in managing risks and making quick decisions during the changing market conditions. For example, succeeding during the downturns requires strategic adjustment of the portfolio, while during the upturns a strong emphasis on the stocks may increase profits.

4.5 Development of hypothesis

Based on previous studies, this study has two hypotheses.

H1: SFDR article 8 and 9 mutual funds yield greater excess returns and risk-adjusted excess returns compared to article 6 mutual funds in Finland.

Hypothesis H1 is based on the idea that ESG strategies may create a long-term competitive advantage for mutual funds, which can be witnessed as higher returns. Research such as Friede et.al (2015) supports this claim by referring to the fact that the increasing popularity of sustainable mutual funds might grow their value at the expense of conventional mutual funds. However, it is important to note that this hypothesis does not necessarily hold in every market condition. For example, during high volatility and market crises, the benefits of ESG integration might be left in the background as investors prioritize liquidity and short-term returns. Additionally, mutual fund management fees and sectoral ESG requirements may have a negative effect on their relative profitability.

Hypothesis H1 also examines risk-adjusted returns and suggests that sustainable mutual funds top conventional mutual funds in this area. This is because ESG criteria might be viewed as a tool for risk management, which reduces their volatility and enhances their returns. Research by Morgan Stanley (2019) portrays that sustainable mutual funds might be more stable during market downturns. Nevertheless, this hypothesis is prone to exceptions, for example, in sectors where ESG criteria may limit the diversification of investments. This may lead to increased volatility, which can further weaken their risk-adjusted performance. Additionally, if the market appears to have ESG bubbles or situations where ESG investments are overvalued, risk-adjusted returns might decrease.

H2: 1. SFDR article 9 mutual funds yield greater excess returns and risk-adjusted excess returns compared to article 8 mutual funds in Finland.

Hypothesis H2 focuses on the internal hierarchy of sustainable mutual funds. Article 9 mutual funds have strict sustainable development goals, which are usually targeted at environmental or societal matters. This makes them theoretically more tempting long-term investments. This hypothesis might, however, be proven false in scenarios where

markets related to sustainable development are still undeveloped or the mutual fund selection criteria limit the possibilities to produce competitive returns. Additionally, if investors are not ready to pay higher fees for the management of these mutual funds, their competitiveness may decrease.

Hypothesis H2 studies risk-adjusted returns within sustainable mutual funds and proposes that Article 9 mutual funds surpass Article 8 mutual funds. H2 is supported by the idea that a stricter ESG focus enhances risk management and reduces mutual funds exposure to negative externalities. Within the context of Finland, this may be seen, for example, in the energy sector mutual funds that prioritize renewable energy sources. On the other hand, hypothesis H2 might not hold in situations where ESG requirements narrow the investment options and increase mutual funds exposure to market shocks. Moreover, if mutual funds possess too many speculative ESG investments, this might increase the risk level and weaken the mutual funds relative performance.

5 Data

Research data consists of mutual funds registered in Finland, which invest widely in different asset classes and global markets. Mutual funds in the scope include equity, balanced, and fixed-income funds, but the research focuses on performance evaluation between sustainable and conventional mutual funds. Monthly NAVs are collected from the Factsheet database, which offers comprehensive and standardized data on mutual fund performance. The data set covers the time between March 2021 and November 2024, and only funds with full NAV during that period are included in it. March 2021 is the month when SFDR classifications first took place and therefore was a reasonable place to start the study.

Since mutual funds in the scope invest widely in different markets, MSCI World is chosen as a benchmark index. This index consists of stocks from developed countries and hence offers a comprehensive reference point for global investments. Index price data is retrieved from the Investing.com platform. The usage of the MSCI World Index ensures that mutual fund returns can be evaluated relative to global market development. Mutual funds in the scope are divided into four different portfolios based on their SFDR classification so that the impact of sustainability-related investment strategies can be evaluated in mutual fund performance. The Bloomberg database offers an official SFDR classification for each mutual fund.

Descriptive statistics offer statistical metrics for the overview of different mutual fund characteristics before an in-depth analysis. Statistics are being presented in table 1. below, and it includes cumulative returns over time, volatility, Sharpe ratio, skewness, and kurtosis. These metrics portray a preliminary outlook on how different mutual fund portfolios and benchmark indexes have been performing during the examination period.

Table 1. Descriptive statistics.

<i>Metric</i>	<i>Article 9 mutual fund portfolio</i>	<i>Article 8 mutual fund portfolio</i>	<i>Combined Article 9+8 mutual fund portfolio</i>	<i>Article 6 mutual fund portfolio</i>	<i>MSCI World index (benchmark)</i>
<i>Number of Funds</i>	6	127	133	40	
<i>Portfolio return</i>	-5,10 %	7,57 %	6,95 %	12,13 %	27,05 %
<i>Standard Deviation (%)</i>	21,58 %	16,41 %	16,63 %	15,42 %	30,84 %
<i>Sharpe Ratio</i>	-0,36	0,24	0,21	0,52	0,76
<i>Skewness</i>	-0,30	-0,57	-0,55	-0,63	
<i>Kurtosis</i>	0,26	0,52	0,50	0,82	

From the table 1, it is clear to notice that the Article 9 mutual fund portfolio had inferior performance compared to other portfolios regarding returns and risk-adjusted returns. On the other hand, the Article 6 mutual funds portfolio had superior performance in comparison to other mutual fund portfolios, and the benchmark portfolio had the best performance out of all portfolios.

6 Methodology

In this chapter, analysis and calculation methods chosen for the research are presented, which are used to evaluate mutual funds risk and return profiles. Mutual fund performance is measured based on their cumulative returns over time, and additionally standard deviation, Sharpe ratio, skewness, and kurtosis are measured. These statistics together form a comprehensive picture of the historical return distribution and risk level. Historical performance data gathered from reliable sources are being used in the calculations. Mutual funds are divided into sustainable and conventional portfolios based on their SFDR classification. Article 8 & 9 mutual funds are classified as sustainable, whereas Article 6 mutual funds represent traditional investment strategies. Based on these classifications, four mutual fund portfolios are being formed: Article 9, Article 8, a combination of the two (9 & 8), and Article 6. Classification enables comparison between sustainable and conventional mutual funds without needing to analyze their asset classes or strategic choices.

The purpose of the research is to examine how sustainability impacts the returns of mutual funds. Therefore, the comparison between asset classes such as equity or fixed-income mutual funds is left out of scope; hence, the research focuses specifically on whether sustainable mutual funds differ from conventional mutual funds in terms of systemic performance. Additionally, research aims to find out how mutual funds compare against global market development. The relevancy of material is being ensured by only including mutual funds with full monthly NAV data between March 2021 and November 2024. In case information is not available during the whole period, mutual funds are left out of the analysis. The changes in possible investment strategies during the examination period are also not taken into account because gathering such information reliably is challenging.

CAPM is used in statistical analysis, which is being used to evaluate the relationship between mutual fund returns and market risk and to estimate the excess return (alpha). To estimate the model, research applies regression analysis to test hypotheses on different

mutual fund portfolios significance in return differences. This approach enables systematic and statistically justified analysis of the relationship between risk and return and the impact of sustainability factors on investment returns. In addition to the CAPM model, a separate regression analysis includes two macro-factors: inflation rate (CPI) of G20 countries and price variations of Brent crude oil. These factors are chosen as part of the analysis, for they are expected to have an impact on mutual fund returns regardless of the general market development. Inflation may have an impact on investment values, for example, with changes in interest rates and the cost structures of companies. Oil prices, on the other hand, serve as an indicator for cyclical movements of the energy markets and the global economy. The impact of these factors will be examined later as part of the results from regression analysis.

6.1 Portfolio returns

Mutual fund returns are calculated by using monthly net asset values (NAV). Portfolio returns are calculated by calculating monthly profits for each mutual fund, and after that, the mean return per portfolio. This is shown in equation 1.

Portfolio mean return is calculated with a formula:

$$r_p = \frac{1}{T} \sum_{t=1}^T r_t \quad (1)$$

Where:

- r_p is the portfolio mean return
- r_t is monthly return
- T is the length of the examination period

Portfolio total return is calculated with cumulative return using the formula in equation 2:

$$r_p = \prod_{t=1}^T (1 + r_t) - 1 \quad (2)$$

For comparison, MSCI World serves as a benchmark that offers a reference point for an average profit in the global markets. The usage of the MSCI World Index as a benchmark is justified because the mutual funds in the scope invest mainly in global markets.

6.2 Standard deviation

Standard deviation is one of the most important risk metrics, for it describes the variations in portfolio returns over time. In the research, standard deviation is calculated for every portfolio to help make comparisons between risk levels in different SFDR-classified mutual funds.

Portfolio standard deviation is calculated in equation 3:

$$\sigma_p = \sqrt{\frac{1}{T-1} \sum_{t=1}^T (r_t - r_p)^2} \quad (3)$$

Where:

- σ_p is portfolio standard deviation
- r_t is monthly return
- r_p is an average monthly return
- T is the number of observations

With standard deviation, it can be analyzed how much mutual fund returns vary relative to their average returns. The higher the standard deviation, the greater the risk for investors because the range of the returns is wider. The significance of the volatility is highlighted especially when comparing sustainable and conventional mutual funds, because

sustainable investment strategies may limit the mutual funds investment universe, which may have an impact on volatility.

6.3 Sharpe ratio

The Sharpe ratio is another widely used metric for financial performance. It describes risk-adjusted profits of the portfolio in relation to its volatility. Goetzmann et al. (2007) investigates hidden challenges of the Sharpe ratio and proposes corrections to improve the accuracy of it. According to them, the Sharpe ratio might be misleading if it is applied to cases where profits do not align with normal distribution.

Sharpe Ratio formula is the portrayed in equation 4:

$$\frac{R_p - R_f}{\sigma_p} \quad (4)$$

where:

- R_p is the return in period i
- R_f is a risk-free rate
- σ_p is the standard deviation of the excess portfolio returns

Goetzmann et al. (2007) highlight that the Sharpe ratio is especially useful for investment comparison, but one must be careful with its interpretation because different market conditions might significantly impact its accuracy.

6.4 Skewness and Kurtosis

Skewness and kurtosis portray the shape of investment profit distribution and particularly its skewness and thick-tailedness. Kim & White (2014) introduces applications for more accurate estimation of these metrics, especially in situations where deviations

from normal distribution are significant. According to them, the risk profiles of investments cannot be truly understood unless the skewness and kurtosis of profit distribution are estimated.

Skewness is defined as:

$$\frac{E \{ (X - \mu)^3 \}}{\sigma^3} \quad (5)$$

Kurtosis is defined as:

$$\frac{E \{ (X - \mu)^4 \}}{\sigma^4} \quad (6)$$

where:

- X is random variable (profit of the investment),
- μ is mean
- σ is standard deviation

Kim & White (2004) state that the asymmetry and peripheral deviations of the profits might be important for risk evaluation, especially when long-term performance of the portfolios is measured.

6.5 CAPM

The Capital Asset Pricing Model (CAPM) is one of the best-known financial theories, which describes the relationship between profit and risk on a market level. Fama & French (2004) examine the empirical functionality and theoretical foundations of CAPM and point out that even though the model is widely used, its empirical accuracy varies. CAPM has proven to be useful, although it has been criticized for not explaining variance

between stock market profits satisfactorily enough. Before CAPM can be calculated, we must first calculate beta. Beta measures the mutual fund's sensitivity to changes in the market and describes how much mutual fund returns vary in comparison to the benchmark. Beta value defines whether mutual funds are riskier (value greater than 1) or more stable (value smaller than 1) than the market.

Beta formula is seen in equation 7:

$$\beta_i = \frac{\text{Cov}(R_i, R_m)}{\text{Var}(R_m)} \quad (7)$$

Where:

- β_i is the beta of the underlying asset
- R_i is the return of the underlying asset
- R_m is the benchmark return
- $\text{Cov}(R_i, R_m)$ is the covariance between the underlying asset and benchmark
- $\text{Var}(R_m)$ is benchmark variance

Once we know the portfolio beta, we can denote its CAPM from the following formula:

$$E_{R_i} = R_f + \beta_i (E_{R_m} - R_f) \quad (8)$$

where:

- E_{R_i} is the expected profit of a security or portfolio
- R_f is risk-free rate
- β_i is beta-factor for market risk measurement
- E_{R_m} is the expected market profit

- $(ER_m - R_f)$ is market premium

Fama & French (2004) point out that CAPM functions well as a simplified valuation model, but its reliability is heavily dependent on how well beta explains the variance of profits in different market conditions.

6.6 Jensen's Alpha

Jensen's Alpha is a financial indicator used to measure excess profits of the portfolio compared to expected profits defined by CAPM. Jarrow & Porter (2010) examine the significance of alpha and note that positive alpha does not guarantee truly abnormal profits, for it may only reflect events with no straight correlation to market arbitrage.

Jensen's Alpha formula is the following:

$$\alpha = R_p - [R_f + \beta \times (R_m - R_f)] \quad (9)$$

where:

- R_p is the real profit of security or portfolio
- R_f is the risk-free rate
- β_i is beta-factor for market risk measurement
- R_m is the real profit of the market

Jarrow & Porter (2010) point out that calculating alpha requires accurate definition of market premium, and positive alpha might also be ambiguous without perfect knowledge of the market dynamics.

7 Results

In this chapter, research results are being presented. First, we look at the more basic performance metrics: cumulative returns, SD, and Sharpe ratio. After that, we present skewness and kurtosis values. In the last part of the results chapter, results from CAPM regressions are being presented and analyzed.

7.1 Portfolio return, standard deviation and Sharpe Ratio

Table 2. Cumulative returns, standard deviation and Sharpe ratio of Article portfolios and benchmark index using monthly returns.

Portfolio	Portfolio return	Standard Deviation	Sharpe Ratio
Article 9 mutual funds	-5,10 %	21,58 %	-0,36
Article 8 mutual funds	7,57 %	16,41 %	0,24
Article 9+8 mutual funds	6,95 %	16,63 %	0,21
Article 6 mutual funds	12,13 %	15,42 %	0,52
Benchmark	27,05 %	30,84 %	0,76

The results portrayed in table 2. above point out significant differences in risk, return, and risk-adjusted returns between SFDR-classified mutual fund portfolios. In line with Yue et al. (2020), this study applies cumulative returns to assess the overall performance of different portfolios across the full sample period. Article 9 mutual fund portfolios are the most strictly regulated regarding sustainability and have made significantly weaker returns (-5.1%) compared to other portfolios and the benchmark. However, Article 8 and a combination of 8 & 9 mutual fund portfolios cumulated positive returns (7.57% & 6.95%). Article 6 mutual fund portfolio consisting of conventional funds made almost double in cumulative returns during the examination period. This observation is in line with a previous empirical study, which claimed that ESG integration might not lead to higher returns but instead might even serve as a limit for profits due to strict investment terms and restrictions (Bauer, Derwall & Otten, 2007) & (Bollen, 2007; Nofsinger &

Varma, 2014). In terms of pure returns, the benchmark index generated by far the greatest cumulative returns.

When examining risk levels, it can be observed that the Article 9 portfolio has the highest volatility (21.58%), which refers to bigger price variations in comparison to other portfolios, while the benchmark index had the highest overall volatility. Article 6 portfolio, on the other hand, has the lowest volatility (15.42%), referring to more stable development. This finding is interesting because in the previous literature it has been observed that sustainable mutual funds may offer lower volatility due to more stable investment targets and strategic goals with a more long-term emphasis (Humphrey & Tan, 2014). However, current results do not offer support for this phenomenon, but more sustainable mutual funds seem rather riskier compared to conventional mutual funds. When assessing risk-adjusted returns, Article 9 portfolio has a negative Sharpe ratio, indicating that their returns did not offer compensation for the risk that was taken. Article 8 and combination (8&9) portfolio are also clearly lower compared to conventional mutual funds, yet positive. The benchmark index has the highest Sharpe ratio, which points out that the global markets have produced notably superior risk-adjusted returns compared to mutual fund portfolios in the scope.

Based on these results, few observations can be made. Firstly, all sustainable mutual fund portfolios had an inferior performance compared to Article 6 portfolio in absolute returns and risk-adjusted returns. This indicates that the sustainability-weighted investment strategy was not optimal in the examination period. Secondly, Article 8 and the combination portfolio (9 & 8) have made better returns compared to the Article 9 portfolio alone but still lost to the Article 6 portfolio. This points out that in comparison to more traditional investment strategies, considering sustainability principles even partly did not offer an advantage for investors. Thirdly, the relationship between volatility and return does not support the assumption that sustainable investments would offer lower risk levels. Instead, a conventional Article 6 mutual fund portfolio proved to be less risky

and more profitable. This observation contradicts some of the previous literature indicating that ESG-weighted mutual funds may deliver lower volatility during market downturns (Lins, Servaes & Tamayo, 2017).

7.2 Skewness and kurtosis

Results in table 3. illustrate distribution in returns between different portfolios with skewness and kurtosis. Skewness is a measure of distribution asymmetry relative to normal distribution, whereas kurtosis demonstrates how much return distributions extreme values differ from normal distribution.

Table 3. Skewness and kurtosis.

Portfolio	Skewness	Kurtosis
Article 9 mutual funds	-0,30	0,26
Article 8 mutual funds	-0,57	0,52
Article 9+8 mutual funds	-0,55	0,50
Article 6 mutual funds	-0,63	0,82

All the portfolios in the scope have negative skewness, meaning mutual fund returns have the tendency towards negative deviations from the average. Article 6 portfolio has the most negative skewness (-0.63), indicating that the returns in the portfolio are more asymmetrically weighted towards negative returns. On the contrary, the skewness of the Article 9 portfolio is the least negative (-0.30), pointing towards a more symmetrical return distribution compared to other portfolios. This may indicate that mutual funds tied strictly to sustainability have not experienced as many singular negative returns compared to more conventional mutual funds, even though their cumulated returns were clearly inferior.

Kurtosis values point out that the mutual fund portfolios return distributions are relatively close to normal distribution, meaning that the values are not significantly high. Article 6 portfolio has the highest kurtosis (0.82), indicating that its return distribution

has had a few more extreme values compared to other portfolios. The Article 9 portfolio has the lowest kurtosis (0.26), referring to a more stable range in returns.

7.3 CAPM regression

Table 4. Results of the CAPM regressions.

Research object	Alpha	Rm - Rf	R2	T-stat	P-value	F-stat	N
<i>MSCI World index as Rm</i>							
Article 9 mutual fund portfolio	-1,55 %	0,67	0,85	-6,76	0,00	244,43	45
Article 8 mutual funds portfolio	-1,68 %	0,52	0,83	-8,75	0,00	209,50	45
Article 9+8 mutual funds portfolio	-1,68 %	0,53	0,83	-8,70	0,00	213,97	45
Article 6 mutual funds portfolio	-1,67 %	0,49	0,83	-8,29	0,00	168,88	45

Simple CAPM regression points out that all the portfolios in the scope had negative alpha values, which means that they failed to produce excess returns relative to the benchmark index. Article 9 had a slightly better alpha value compared to other portfolios (-1.55%), and all the other portfolios are very close to each other (ranging from -1.67 to 1.68). This indicates that all the portfolios performed weaker than what was expected considering the market risk. Beta value ($R_m - R_f$) is highest with the Article 9 portfolio (0.67) and lowest with the Article 6 portfolio (0.49), implying that the most sustainable mutual funds have been exposed to greater market risk compared to conventional mutual funds.

The R^2 value measures how well the mutual fund's returns can be explained with the market development. The Article 9 portfolio has the highest R^2 value (0.85), meaning its returns are very much aligned with the benchmark index. All the other portfolios have slightly lower R^2 values but still over 0.80. The Article 6 portfolio had the lowest R^2 value, indicating the least dependency on the general market development in comparison to other portfolios. Scatter plots in Figure 7. below illustrate the relationship between mutual fund portfolio excess returns and benchmark index excess returns. Every scatter plot involves a regression line whose slope describes the sensitivity of market risk, and the

R^2 value describes how big a part of the return variations can be explained with the market returns.

In this analysis, the reported t-statistics, p-values, and F-statistics refer specifically to the alpha coefficients (intercepts) in the regression. T-statistics for all the regressions are large negative values, indicating that alpha values differ significantly from zero. This means that it is highly unlikely that negative alpha values would happen by chance. The magnitude of the t-statistics correlates with the certainty of the effect, the larger the absolute value of the effect, the stronger the evidence of an effect. P-values for all the regressions are zero, meaning their statistical significance is very high ($p < 0.001$). Based on this, all the portfolios had negative and statistically significant risk-adjusted excess return relative to the benchmark portfolio. Results from the F-test strengthen the overall explanatory power of the model. F-statistics further confirm that the alpha coefficients are highly significant within each regression model. For example, the F-value for the Article 9 portfolio is 244.43, meaning that the whole regression model is statistically significant and explains the vast majority of the variation of the dependent variable. The number of observations (N) is 45, and it reflects the 45-month sample from monthly returns.

These results do not support research hypotheses, according to which sustainable mutual funds outperform conventional mutual funds in terms of excess returns or risk-adjusted excess returns. Despite the SFDR classifications, none of the portfolios in the scope yielded positive or statistically significant alpha. This challenges the presumption that sustainable investment strategies lead to an enhanced economic profit when performance is evaluated with alpha. These results are aligned with the observations from Renneboog, Ter Horst & Zhang (2008) and Statman & Glushkov (2009).

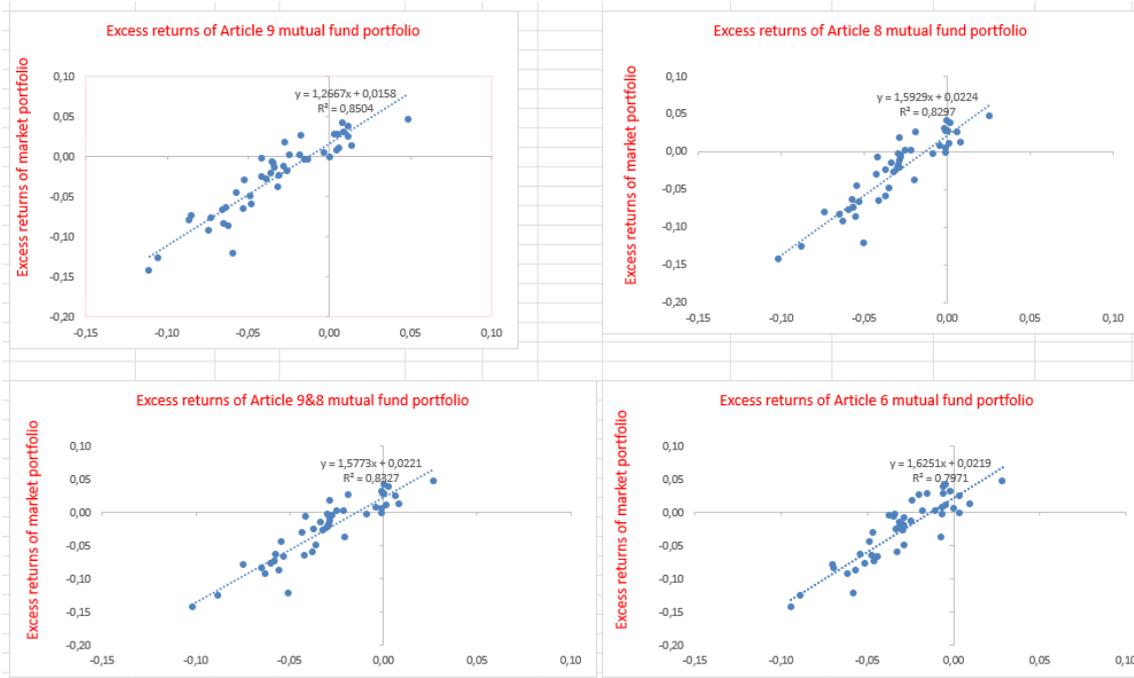


Figure 7. Scatter plots of mutual fund portfolio excess returns.

Table 5. Results of extended macro-factor regression.

Research object	Alpha	Rm - Rf	G20 CPI	Brent Oil	R2	T-stat	P-value	F-stat	N
<i>MSCI World index as Rm</i>									
Article 9 mutual funds portfolio	-0,67 %	0,66	-0,14	-0,06	0,86	-0,76	0,45	86,95	45
Article 8 mutual funds portfolio	-0,24 %	0,50	-0,22	-0,03	0,85	-0,32	0,75	75,48	45
Article 9&8 mutual funds portfolio	-0,26 %	0,50	-0,22	-0,03	0,85	-0,35	0,73	76,88	45
Article 6 mutual funds portfolio	0,21 %	0,46	-0,29	-0,01	0,83	0,28	0,78	64,51	45

Table 5. above illustrates the results of extended macro-factor regressions where the impact of G20 countries inflation rate (CPI) and the changes in Brent oil price are taken into account alongside the market risk. Extended macro-factor regression offers a more in-depth understanding of the factors behind the SFDR-classified mutual fund performance. Results highlight that the market risk remains as the integral amplifier in all portfolio performance, but the impact of CPI and Brent oil price varies between the portfolios. The impact of market risk is highest in the Article 9 portfolio, implying a rather strong market dependency. This is consistent with the previous results and points out that the

mutual funds with the strongest commitment to sustainability follow market development most closely, whereas the beta value is lowest with the Article 6 portfolio.

Alpha values in this extended macro-factor model offer interesting reference points in relation to simple CAPM. Alphas in all the mutual fund portfolios have significant change for the better, indicating that at least some of the negative excess returns in the simple CAPM can be explained with macro factors, especially with inflation. Article 6 portfolio's alpha changes into positive (+0.21), which may indicate that conventional mutual funds react more favorably to changes in the macroeconomy during the examination period. The impact of inflation is negative in all portfolios, as expected, so if inflation rises, it has a negative effect on mutual fund NAV. Article 8 and the combination portfolio (8 & 9) have similar sensitivity to inflation, whereas the Article 9 portfolio has the lowest (-0.14) and the Article 6 portfolio had the highest (-0.29) sensitivity. This may indicate that the more sustainable mutual funds have components that offer better inflation protection compared to conventional mutual funds.

On the other hand, changes in Brent oil prices seem to have only a little explanatory value on mutual fund returns. Sensitivity in all portfolios in the scope for Brent oil price changes is between (-0.01 – 0.06), which points out that the significance of the price changes is very small. This is expected, especially with Article 9, 8, and combination portfolio (9 & 8), because most of the mutual funds in this bracket screen out investments involving fossil fuels from their portfolios. The R^2 value increases a little bit in all portfolios when inflation rate and Brent oil price changes are included in the regression.

In this regression, the reported t-statistics, p-values, and F-statistics refer specifically to the alpha coefficients (intercepts), not to the macro-factors or beta values. The expanded regression model, including G20 countries CPI and the changes in Brent oil price, does not produce statistically significant alpha values for any of the portfolios in the scope. T-statistics are small, and P-values are significantly above the regular significance levels, indicating that alphas cannot be statistically proven to differ from zero. In other

words, when additional macro-factors are included in the model, it cannot be proven that any portfolio would have produced systematic under- or excess returns relative to the benchmark or the combination of general economic factors. Results from the F-test vary between 64.51 and 86.95, and even though they indicate that models are still statistically significant, their explanatory power is visibly weaker compared to the simple CAPM model. For example, Article 9 portfolios F-value (86.95) is remarkably lower compared to the simple CAPM model value (244.43). This indicates that the two macro-factors added besides market return do not explain portfolio returns as effectively.

These results are aligned with some of the previous literature, such as the study from Leite & Cortiz (2020), who observe that macroeconomic factors such as inflation or oil price changes enhanced the explanatory power of regression models from SRI mutual funds. However, they did not offer statistically significant alpha values. Correspondingly, Elton, Gruber & Blake (1996) point out that adding macroeconomic factors into a regression model might explain some of the variation in mutual fund returns, but usually not the differences between returns in different mutual fund types.

8 Discussion and conclusion

At the center of this research was to examine whether SFDR classifications explain returns and risk-adjusted returns of Finnish mutual funds. Previous literature has been conflicting about whether sustainability criteria offer real economic benefits or whether they set restrictions that weaken the profits. Hypotheses were built on the assumption that higher-ranked mutual funds on the SFDR classification scale would deliver better returns and risk-adjusted returns compared to more traditional mutual funds. Another hypothesis was built on the assumption that there are also differences within sustainable mutual funds, meaning that more sustainable mutual funds would equal greater returns and risk-adjusted returns.

Previous literature supports the idea that ESG integration might lead to better risk-return value in the long term. For example, according to a large meta-analysis from Friede, Busch and Bassen (2015), most of the research signals a positive or neutral connection between ESG criteria and economic performance. Whelan et al. (2021) present similar results, illustrating that sustainability criteria may tempt investors, reduce regulation risks, and enhance operative efficiency. Suresh & Thomas (2023) point out that mutual funds with an ESG focus may lead to competitive returns and better help to manage risks. Based on these studies, it is rather easy to expect that mutual funds with higher SFDR classifications would achieve higher risk-adjusted returns compared to mutual funds with lower SFDR classifications.

On the contrary, some of the previous literature questions the possible benefits of ESG criteria. Studies from Bauer, Derwall & Otten (2007) and Statman & Glushkov (2009) point out that sustainable investing mutual funds might not overcome conventional mutual funds in terms of economic performance, particularly in the short term. On the other hand, Petridis et al. (2023) highlights that mutual funds with ESG emphasis that have experienced reputational issues, or other controversies are performing worse than other mutual funds, undermining the importance of the quality of the ESG processes. Nofsinger & Varma (2014) and Lins, Servaes & Tamayo (2017) notice that even though

ESG strategies may offer protection during downturns, they do not always explain superior returns in general. Therefore, although some of the previous literature offers support for this research hypothesis, there are also other parts of the literature that refer to the fact that ESG-linked investing does not automatically lead to better returns.

My research illustrates that Article 9 mutual fund portfolio, which were expected to deliver the best and the most stable returns, produced the weakest returns both in cumulative and risk-adjusted returns (cumulative returns of -5.10% and Sharpe ratio of -0.36). The Article 8 mutual fund portfolio produced slightly better cumulative returns (7.57%) and Sharpe ratio (0.24). The combination portfolio of Article 9 & 8 mutual funds had very similar results to the Article 8 portfolio alone, which might be explained by the very low amount of Article 9 mutual funds (6 in total) in the whole portfolio. Article 6 mutual fund portfolio consisting of more conventional funds had better returns and risk-adjusted returns compared to more sustainable portfolios (cumulative returns 12.13% and Sharpe ratio 0.52). This conflicts with the assumption that higher SFDR classification would correlate with greater returns. It is also relevant to notice that the benchmark index had superior cumulative returns and Sharpe ratio compared to all the portfolios in the scope (27.05% and 0.76). In terms of volatility (standard deviation), the same trend seemed to continue: the higher the SFDR classification, the more volatility it seemed to have. This observation conflicts with some of the previous studies, where ESG investments have been seen to even the risks, especially in the more unstable markets (Humphrey & Tan, 2014; Morgan Stanley, 2019).

The results from simple CAPM regression suggest that all the mutual fund portfolios had negative alpha values during the examination period, meaning none of them had excess returns relative to the benchmark. Expanded macro factor regression, including G20 countries inflation rates and Brent crude oil price changes as macro factors, revealed slightly better alpha values in all portfolios. The Article 6 portfolio had the best results out of all portfolios, and the Article 9 portfolio had the worst results in both regression models, offering yet another contradicting factor to the research hypotheses. Regression

models also revealed that higher beta values correlated more strongly with negative returns. Overall, this research does not offer support for either of the two hypotheses:

H1: SFDR article 8 and 9 mutual funds yield greater returns and risk-adjusted returns compared to article 6 mutual funds in Finland.

H2: 1. SFDR article 9 mutual funds yield greater returns and risk-adjusted returns compared to article 8 mutual funds in Finland.

Even though ESG integration has been justified with better risk management and long-term value creation (Friede et al., 2015; Suresh & Thomas, 2023), based on this research, mutual funds with the highest SFDR classification have not offered better returns or smaller volatility in the examination period. There might be several explanations for this, such as strict investment limitations, Covid-19, the Ukraine war, or the overheating of the ESG market. However, the results are in line with research from (Bauer et al., 2007; Nofsinger & Varma, 2014), who warn about the limitations of ESG strategies and argue that sustainability itself does not guarantee better profits.

It is also important to recognize the limitations of this research. Firstly, the examination period limits the timespan to between 2021 and 2024, which included major financial uncertainty: inflation spikes, geopolitical tension, and a global pandemic. Within these circumstances, the long-term strategies of mutual funds may not emerge. Secondly, the interpretation of SFDR classification is still in progress, and there might be great differences between mutual funds in the same category. Thirdly, metrics used in the study, such as the Sharpe ratio and CAPM, are based on the assumption of normal distribution, which does not necessarily apply in practice, as Kim & White (2014) have proven. Also, the data set is narrowed down to only mutual funds registered in Finland, which may limit the generalization of results to other markets.

In conclusion, this research carries critical viewpoints into possible economic benefits of sustainable investing. Although sustainability is an important and growing theme, it cannot be automatically expected to produce superior results, at least in the short- or medium-term, or without more accurate strategic differentiation. In future research it would be useful to delve deeper into the internal strategies of mutual funds and widen the examination period over the economic cycles. Also, the usage of alternative metrics in research, such as downside risk analysis or the impact of other ESG components, might help better understanding of when and why sustainable investments might offer additional value.

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