

Mestrado em Estatística e Gestão de Informação

Master Program in Statistics and Information Management

ESG Investing

An analysis on the performance of sustainable ETFs

Filipe Tomás da Piedade Prazeres

Dissertation presented as partial requirement for obtaining
the Master's degree in Statistics and Information
Management

NOVA Information Management School
Instituto Superior de Estatística e Gestão de Informação
Universidade Nova de Lisboa

ESG INVESTING: AN ANALYSIS ON THE PERFORMANCE OF SUSTAINABLE ETFs

by

Filipe Tomás da Piedade Prazeres

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Advisor: Prof. Carlos Rafael Santos Branco, PhD

November 2021

ACKNOWLEDGEMENTS

I must admit that the path until the conclusion of this Dissertation was not easy. This study was started, developed, and concluded during a global pandemic where society faced radical changes in all aspects of our daily life. For us, students, the reality of online school, online meetings, etc. imposed new challenges that none of us were used to deal with. Regardless, the support that was shown to me during this period was remarkable. So, I want to demonstrate my gratefulness.

First, I would like to show my appreciation to my parents and grandparents that made all this possible. From allowing me to pursue my studies, to showing me full support and demonstrating their pride in me.

To my girlfriend, Bárbara, that understood me and believed in me during all these stressful months.

To my classmates from NOVA IMS, Cristiano and Miguel, that helped me with all my doubts.

To my closest friends, for the concern and encouragement shown throughout this process.

To my team from Banco BEST, who not only understood my position in the last few months but also for demonstrating full support and aid in this project. A special thanks to Carlos Almeida for his guidance and flexibility, which was essential for the conclusion of this study.

To my Advisor in this study, Professor Carlos Branco, for all the help throughout the course and for accepting to work with me in this project.

Thank you all!

ABSTRACT

In recent decades the financial markets have seen the expansion of ESG investing, as financial institutions and individuals progressively recognize the environmental, social and governance issues, i.e., ESG factors, translating into potential risk factors that can not only affect the overall business structure but also the returns on their investments. Parallel to this increase in the awareness of the overall population, investors across the globe have also been in highly demand for passive investments in the form of Exchange Traded Funds (ETFs). Both were initially considered as a trend in the financial sector but nowadays, it is fully incorporated in the practices of both asset managers and institutional/retail investors.

This study analyses the performance of European domiciled ETFs, focused on European equity, with high ESG ratings, and compares them against low ESG rating ETFs to assess if the ESG factors can indeed produce significant better results for investors. For this research it will be used monthly data considering a sample period from 31st of October 2016 to the 31st of October 2020, i.e., 4 years.

As a measure of ESG, the Morningstar Sustainability Rating will be employed on this study to divide the ETFs in two portfolios: the sustainable and unsustainable portfolios. Afterwards, the alphas of each portfolio will be obtained by employing 4 different factor models: the CAPM, the Fama-French 3-factor model, the Carhart 4-factor model and the Fama-French 5-factor model.

The results obtained were unable to provide a clear evidence to support the outperformance of sustainable ETFs over unsustainable ETFs. However, this research indicated that from all the factor considering models studied, the Fama-French 5-factor model revealed to have the biggest power of explanation regarding the returns of both sustainable and unsustainable ETFs.

KEYWORDS

ESG; ETF; ESG Performance; Capital Markets; Asset Pricing Models

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LIST OF ABBREVIATIONS AND ACRONYMS

CMA_t	Conservative Minus Aggressive factor
HML_t	High Minus Low factor
MOM_t	Momentum factor
r_f	Risk-free rate
RMW_t	Robust Minus Weak factor
SMB_t	Small Minus Big factor
AUM	Assets under Management
BNP	BNP Paribas
CAPM	Capital Asset Pricing Model
CEO/CEOs	Chief Executive Officer / Chief Executive Officers
CMVM	Comissão do Mercado de Valores Mobiliários
$E(r_i)$	Expected return on asset
$E(r_M)$	Expected return on the market portfolio
$E(r_M) - r_f$	Risk premium on the market portfolio
ESG	Environmental, Social and Governance
ETF/ETFs	Exchange Traded Fund/ Exchange Traded Funds
ETPs	Exchange Traded Products
EU	European Union
EUROSIF	European Sustainable Investment Forums
GSIA	Global Sustainable Investment Alliance
KPMG	KMPG Global
NAV	Net Asset Value
OECD	Organization for Economic Co-operation and Development
R^2	R squared
RBC	Royal Bank of Canada

SRI	Socially Responsible Investing
TER	Total Expense Ratio
UN PRI	United Nations Principles for Responsible Investment
USD	United State Dollar

1. INTRODUCTION

The financial world has seen several different investment trends emerge in the past, but over the last decades, sustainable investing, or as it is broadly known, ESG investing, has gained the utmost notoriety. Alongside to this, the financial industry has witnessed a rising demand for passive investing in the form of Exchange Traded Funds (ETFs).

Sustainable corporate practices have seen a growing interest by the society in recent decades, according to Witold Henisz, Tim Koller, and Robin Nuttall from McKinsey & Company (2019), the focus on this subject emerged from the consumer attention on the impact of corporations in society (Henisz et al., 2019). In August 2019, the CEOs from the 181 largest American companies – members of the US Business Roundtable – formally recognized, by signing a commitment letter¹, the importance of their responsibility towards all their stakeholders, i.e., society-at-large (Tucker & Jones, 2020). This proves the importance given to corporate accountability for preserving sustainable practices and good social values. Among the general public, institutional and retail investors also started to pay attention to the benefits of investing in companies who proved to be concerned and aware of the consequence of its actions. This led to the arise of a trend in the financial sector, the so-called ESG Investing. ESG is an acronym for Environmental, Social and Governance. These reflect the issues that may affect organizations reputation and profits and may cause a huge impact on the overall society, which most of the time are interconnected between each other. Therefore, ESG Investing is a term that defines various methodologies led by investors at the time of selecting where to allocate their investments, that considers a set of thoughts based on these three pillars. The growing interest by investors towards conscious investing can be seen by the scale of investments flows, which may indicate that ESG Investing, which started as a trend, might instead be a common practice at the time of investing (Henisz et al., 2019).

Although the recent increase in investors' awareness for these sustainable practices, the origins for these kind of investment dates to many centuries ago. The modern conceptualization of Sustainable Investing can be traced to the second half of the 20th century, more precisely to the decade of 1960, where the political tensions and environmental concerns increased among investors, leading them to invest in companies who portrayed themselves as being conscious of the fact that their actions would have consequences for the masses. (Bauer et al., 2005)

In 2019, the GSIA reported that in just two years, from 2016 to 2018, the number of sustainable assets under management in the five bigger markets in the world, grew over 30%, reaching 30,7 trillion USD, being Europe the biggest contributor to this growth (GSIA, 2019). This demonstrates the recognition by investors, either institutional or retail, and asset managers, of the importance and overall impact of these practices. Regulators are also aware of this overall growth and its significance, in May 2018, the European Commission issued several proposals that aimed to unify and standardize the practices regarding the release of ESG-related information (KPMG, 2020).

Parallely, the interest for passive investing by investors has also risen in the past decade. ETFs and mutual funds are the most common forms of passive investing. ETFs or Exchange Traded Funds are baskets of securities, that normally have the intention to replicate an index. The majority of ETFs apply

¹ "Our Commitment – Statement on the Purpose of a Corporation"

these passive strategies. By doing this, the number of transactions of securities are reduced and thus less risk exposure of mismanagement of assets (Mitikka, 2017). The allure of these kind of financial products is the diversification that they bring to the investor, as well as the low fees that these are able to provide, which are generally a major drawback to possible returns. Since its creation in 1993, the rising interest in ETFs, can be illustrated by the increase of the number of Exchange Traded Funds listed worldwide. Since 2010, the number of listed ETPs (or Exchange Traded Products) have more than doubled (Deutsche Bank & ETFGI, 2021).

Due to the weight that sustainable investing has reached within the financial markets, many studies have been conducted to evaluate how these practices are related to the returns of investments. Previous studies have mainly focused on mutual funds, like for instance, Bauer et al. (2005) and Yue et al. (2020). Since ETFs entail many advantages when compared to mutual funds, Mitikka (2017), studied the performance of high ESG rating ETFs compared against low ESG rating ETFs, all of which were USA domiciled ETFs. Since Europe is the recognized as a leader in sustainable assets under management, this study will be focused on the performance of European domiciled ETFs regarding European Equity and assess if European ETFs with high rating of ESG produced better results, i.e., outperformed, European ETFs with low rating of ESG.

To achieve the purpose of this study it will be used methodologies previously used in the studies of Bauer et al. (2005) Mitikka (2017), Yue et al (2020). These studies used similar methodologies to achieve the desired results. All authors based their research in asset pricing models to find the alphas of both portfolios, the sustainable and unsustainable. The method employed by Mitikka (2017), is the most complete out of the mentioned three studies and therefore this research will be based mostly on this. The models that were chosen to be used in the present study includes the CAPM as the one-factor model and then the multifactor models such as the Fama-French 3-factor model, Carhart 4-factor model and lastly the Fama-French 5-factor model.

The present research is structured as it follows. In Chapter 2 and 3, it is displayed the Literature Review, where the first chapter (2), starts by describing the concept of Sustainable Investing and then moves on to explain in depth the specifics and the notion of ESG Investing, and then the later chapter (Chapter 3), presents the instrument studied in this research, the ETFs and its specific characteristics. Further on, Chapter 4, explains the Methodology used to carry out this study. In Chapter 5, it is presented the data collect and its respective source. The results are later presented and discussed in Chapter 6. Lastly, in Chapter 7 and 8, it is revealed the Conclusions retrieved from the results and the Limitations found during the elaboration of this study, as well as suggestions for future works.

2. LITERATURE REVIEW

2.1. SUSTAINABLE INVESTING

The conceptualization of Sustainability in a business context is an ever-evolving process. The Conference Board defined it as “the pursuit of a business growth strategy that creates long-term shareholder value by seizing opportunities and managing risks related to the company’s environmental and social impacts” (Hedstrom, 2019). Parallel to this concept, the European Commission defines Sustainable Finance as an effort to promote economic growth while not compromising the environment and taking into consideration the social and governance aspects (European Commission, 2021).

Sustainable Investing can be recognized by several terms, which can be used interchangeably due to the similarities of its core concept (Mitikka, 2017). These terms can be for example Impact Investing, Sustainable and Responsible Investment, Socially Responsible Investing (SRI), ESG Investing, Green Investing, Sustainable Investing, Ethical Investing, and Responsible Investing, all of which in one way or another, refer to the intent of “achieving specific, positive social benefits while also delivering a financial return” (Schroders, 2019). What differentiates these concepts, is the investment purpose, delineated by the investors themselves (UN PRI, 2017).

Hence, a possible definition of sustainable investing is given by the Eurosif as being “a long-term oriented investment approach, which integrates ESG factors in the research, analysis, and selection process of securities within an investment portfolio” (Eurosif, 2016).

Socially Responsible Investing (SRI) and the so-called ESG Investing are the most popular terms of this conceptualization. The first entails the inclusion of “ethical, environmental, social, and governance factors into investment decision-making” (Louche & Hebb, 2014) selecting preferred ethical investments, thus limiting the pool of assets from where to choose, during the portfolio construction. The latter includes environmental, social, and governance factors as a measure to assess the further impact of the investments (Tucker & Jones, 2020). Probably because of the clearness of ESG Investing, it became the most well-known and used term among the public to refer to all things related to Sustainable Investing.

2.2. ESG: ENVIRONMENTAL, SOCIAL AND GOVERNANCE

ESG corresponds to the initials of Environmental, Social and Governance, which represent specific factors to consider during investment analysis and portfolio planning, since these may affect companies' profits and reputation. Therefore, ESG Investing is the name given when referred to the investment-related activity that has the mentioned factors into consideration. According to Douglas Grim and Daniel Berkowitz from Vanguard (2018), ESG Investing must not be referred to as a different class of assets, a single strategy, or a singular category of action.

The three different factors of ESG, refer to a specific field of action, where we encounter an extensive list of potential issues, which is being continually updated, as Figure 2.1 below represents.

Environmental 	Air emissions and air quality	Fossil fuels	Occupational health and safety
	Biodiversity protection	Hazardous materials use	Renewable energy sources
	Community health, safety, and security	Land contamination	Waste generation
	Energy conservation	Natural resource preservation	Water use and conservation
Social 	Adequate housing	Consumer privacy	Opioids
	Abortion providers	Employment of minorities and women	Religious values
	Adult entertainment	Human rights standards	Tobacco
	Alcohol	Income inequality	Union relationships
	Animal testing	Manufacturers of birth control products	Weapons
	Casinos and gambling equipment	Obesity	Workforce exploitation
Governance 	Antitrust violations	Consumer fraud	Political contributions
	Auditor independence	Disclosure of material risks	Reporting transparency
	Board independence and elections	Executive compensation	Short-term focus
	Board diversity	Oversight of strategy	Voting rights

Figure 2.1 - Examples of potential issues of ESG factors
Source: Vanguard, 2018

The interest and demand from institutional and retail investors have created room for the development of ESG investing in recent years. According to Riccardo Boffo and Robert Patalano from OECD (2020), these investors aim to better integrate and assess long-term financial risks and opportunities into their investment process to obtain long-term value. The Global Sustainable Investment Alliance (GSIA) - a prominent sustainable investment advocate, which is the result of a collaboration between sustainable investment organizations around the world – estimated, in its 2018 report that at the start of that same year, in the five major markets worldwide, the global sustainable

assets value, i.e., assets that incorporate elements of ESG review, has reached 30,6 trillion USD (GSIA, 2019), an increase of 34 percent in only two years, as seen in Figure 2.2 below.

Region	2016	2018
Europe	\$ 12,040	\$ 14,075
United States	\$ 8,723	\$ 11,995
Japan	\$ 474	\$ 2,180
Canada	\$ 1,086	\$ 1,699
Australia/New Zealand	\$ 516	\$ 734
TOTAL	\$ 22,890	\$ 30,683

Figure 2.2 - Value of Global Sustainable Assets 2016-2018
Source: GSIA, 2019

Figure 2.2 demonstrates that in Europe the value of ESG practice related assets, in 2018 was over 14 trillion USD, establishing Europe as the leader in global sustainable assets worldwide. In the United States of America, it has reached over 11 trillion USD.

Considering the increase of demand by investors, the financial sector is designing more and more ESG-related products, ranging from ratings to funds. The proliferation of ESG screened indexes in the past 30 years, mirrored in Figure 2.3 below, is an example of how the finance industry is adapting to the growth of interest by investors. Another example of this is the rapid emerging of companies denoted as ESG rating suppliers (Boffo & Patalano, 2020).

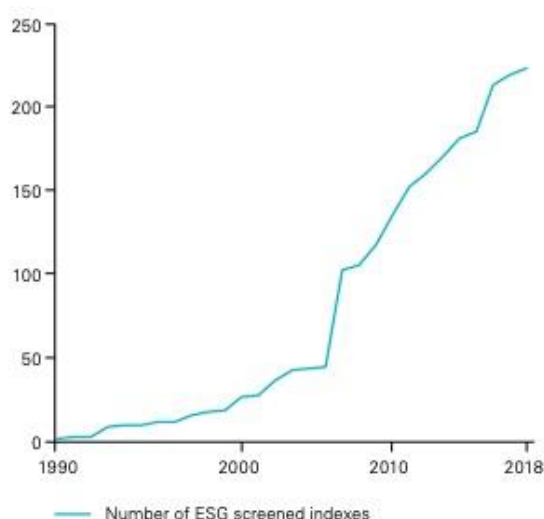


Figure 2.3 - Growth of ESG screen indexes
Source: Vanguard, 2018

2.2.1. Drivers of ESG investing

The demand of investors for ESG-related investment products may be explained by various reasons. Given the aspects of financial and social returns that influence the adoption of ESG methodologies, it is needed to evaluate the societal drivers of ESG investing. While institutional investors are focused on

the benefits of ESG investing for the returns and risk mitigation, end-investors tend to adopt these methodologies to align their portfolios with society values (Boffo & Patalano, 2020).

Surveys suggest that investors assume some different positions on why they are interested in integrating ESG into their investment decision-making. BNP Paribas, for example, concluded - by asking why to incorporate ESG into investment decision-making to investors and asset managers - that long-term returns are the main intention of investors for adopting ESG metrics, with over half of the respondents choosing this option (52%). Next, we see that reputation is another focal point for respondents, with 47 percent. To finish the top three reasons, investors believe that ESG investing has a direct link to the decrease of investment risk (BNP, 2019), as we can see in Figure 2.4 below.



Figure 2.4 - Drivers of ESG integration
Source: BNP, 2019

2.2.2. ESG investment strategies

In pursuance of ESG-related investing, investors and asset managers, developed approaches to achieve their goals. Depending on the understanding of the subject, investors must choose the strategy that better fits their intentions. However, it is not required to only select one single approach, instead, investors can embrace multiple techniques.

Following GSIA, the investment company, Vanguard adapted and defined four main ESG Investing strategies (Grim & Berkowitz, 2018):

1. **ESG Integration:** The inclusion of ESG information to complement the investment analysis, which does not necessarily exclude investments in entities due to unwanted activity.
2. **Active Ownership:** The use of investor resources to positively influence the corporate behaviour on ESG-related issues.
3. **Portfolio Screening:** The adoption of exclusionary screening, which excludes or underweights instruments based on specific ESG criteria, as well as, the usage of

inclusionary screening, which overweight or only includes instruments with higher ESG ratings.

4. **Impact Investing:** Specific investments, with the ambition of not only generating a positive impact but also a level of financial return.

UN PRI, United Nations Principles for Responsible Investments, is considered one of the most notorious promoters for responsible investing in the industry. Supported by the United Nations, UN PRI is continuously operating for the development of strategies related to the ESG criteria incorporation, describing three approaches for considering ESG issues over the portfolio building, as shown in Figure 2.5 below.

CONSIDERING ESG ISSUES WHEN BUILDING A PORTFOLIO (known as: ESG incorporation)		
ESG issues can be incorporated into existing investment practices using a combination of three approaches: integration, screening and thematic.		
Integration	Screening	Thematic
Explicitly and systematically including ESG issues in investment analysis and decisions, to better manage risks and improve returns.	Applying filters to lists of potential investments to rule companies in or out of contention for investment, based on an investor's preferences, values or ethics.	Seeking to combine attractive risk-return profiles with an intention to contribute to a specific environmental or social outcome. Includes impact investing.

Figure 2.5 - ESG Investing strategies
Source: UN PRI, 2017

We can observe that different organizations present different terminologies, displaying a lack of consensus on how to properly define the concept of ESG Investing, as a result it has been difficult to monitor all trends in asset growth. (Grim & Berkowitz, 2018)

Corporations, particularly the larger, are nowadays becoming more compliant with the ESG-related factors, frequently providing investors and stakeholders with ESG practices disclosures in their reports. This can be a useful tool for issuers to communicate their socially responsible practices and for investors to assess and better understand the potential social returns. (Boffo & Patalano, 2020)

2.2.3. ESG scores, ratings and indexes

In recent years, we have watched the rise of some measurement systems to face the investor's demand for a way to evaluate the sustainability of their investments. The transformation of ESG-related information into practical information for the investment process is made possible through ESG ratings, made available by ESG rating firms. It constitutes an important tool for investors to assess and exploit the ESG disclosures made by companies (Boffo & Patalano, 2020). ESG ratings are normally commercially available, therefore is of easy accessibility by all kind of market participants.

However, according to the consulting firm McKinsey & Company (2020), the abundance of information and extensive reports regarding the ESG practices from the companies, becomes challenging for investors to translate it into valuable information to the point that only 15% of the enquired investors can fully integrate this kind of information into their investment decisions. (McKinsey & Company, 2020)

2.2.3.1. Morningstar Sustainability Rating

For the research purposes, it is relevant to deepen and explain the Morningstar Sustainability Rating, as will be the ESG Rating method applied in this study.

Morningstar introduced, in 2016, the Morningstar Sustainability Rating, to support investors use ESG-related information to evaluate their portfolios, based on underlying company ESG Rating from Sustainalytics. In 2019, Morningstar improved its Sustainability Rating by changing Sustainalytics' ESG Rating by its own ESG Risk Rating. (Morningstar, 2019)

The rating is a historical holdings-based computation using the level of ESG Risk Rating of the companies, it is calculated for managed products and indexes worldwide using the Morningstar portfolio holdings database. The derives from a three-step process (Morningstar, 2019):

1. **Calculation of Morningstar Portfolio Sustainability Score:** The weighted average of company-level ESG Risk Rating, from Sustainalytics, that measures the degree to which companies' value may be at risk because of ESG issues. The rating is evaluated on a 0-100 scale, with 0 representing that the company shows a full management of ESG risks, and 100 the opposite. There are five risk categories, depending on the score (Figure 2.6):

- 
- ▶ 0-9.99: Negligible ESG Risk
 - ▶ 10-19.99: Low ESG Risk
 - ▶ 20-29.99: Medium ESG Risk
 - ▶ 30-39.99: High ESG Risk
 - ▶ 40+: Severe ESG Risk

Figure 2.6 - ESG Risk Categories
Source: Morningstar, 2019

2. **Computation of Morningstar Historical Portfolio Sustainability Score:** By computing the weighted average of the last 12 months of Morningstar Portfolio Sustainability Score.
3. **Morningstar Sustainability Rating:** Categorization based on the Morningstar Historical Portfolio Sustainability Scores (Figure 2.7, below):



Figure 2.7 - Morningstar Sustainability Rating
Source: Morningstar, 2019

2.2.4. ESG Risk

The importance given to sustainability, social conditions, and proper governance, has raised awareness for the risk of disrespecting and/or not complying with the general effort of establish a solid ESG policy within companies. Therefore, a new type of risk has emerged in the recent years, the ESG risk, which, i.e., is the risk brought by the previously mentioned notions of ESG, whose can affect the company's market valuation, and lead to firm's reputational hazard. For example, environmental harm caused by companies' operational decisions may lead to negative financial consequences in the long-term; Poor workplace conditions and socially discriminatory policies can possibly drive to general workers discontent, which can implicate generalize strikes, meaning a decrease in production and in this way lead to financial distress; And mistakes in the corporate governance policies, made by higher management, can increase governance risk, thus effecting companies' market value. (Maginn et al., 2007)

The CMVM, Comissão do Mercado de Valores Mobiliários - the Portuguese regulator for financial markets - stated in its Risk Outlook 2021 (2021), that the ESG Risk and the negative externalities caused by the unproper handling of natural resources are not well reflected in the capital markets and in this way, since capital markets fund the human activity, the repercussions in the real economy could be devastating.

With this in mind, the regulator, also issues a warning to all participants in financial markets, including regulators, that the reputation of both broad market participants and regulators is at stake. On one hand, regulators define the rules of negotiation, and so, the distribution and creation of ESG-related product must be under a close eye of the regulators, due to the risk of *greenwashing*². On the other hand, investors must be critical regarding the financial information received. (CMVM, 2021)

² CMVM (2021) defined it as the risk of wrongly appropriation of ESG qualities when, in reality, it does not portrait such characteristics.

3. LITERATURE REVIEW

3.1. EXCHANGE TRADED FUNDS

Exchange Traded funds, or ETFs, as they are ordinarily known, are investment funds that are listed in a stock exchange. These particular financial instruments share several key features with mutual funds, in the sense that, an ETF is a selection of securities, but additionally it is traded like a stock. (Hehn, 2005)

On one hand, according to Bodie et al. (2014), an Exchange Traded Fund portrays itself as more advantageous than mutual funds because since it is listed in a stock exchange - it trades continuously - and as so, investors have much more accessibility to purchase a share of the ETF when compared to a mutual fund, where its NAV (Net Assets Value) is only calculated at the end of the day. Moreover, ETFs offer lower management fees due to lower investment in marketing by the issuer, and therefore being cheaper to the average investor. Another advantage of the ETF, when facing mutual funds, is that if investors decide to sell their positions of the fund, fund managers frequently must sell some shares in which the fund was invested to be able to provide the necessary cash for the repayment of investors, whereas in the ETFs, once shares of the funds are sold, it is not necessary, since their positions are sold to another investor (Hull, 2018).

On the other hand, ETFs also presents a disadvantage. The price of these specific products can deviate from its calculated NAV, especially in stressed market conditions, and so, this disparity in prices can potentially overshadow the advantages that ETFs can offer. (Bodie et al., 2014)

Despite the disadvantage mentioned, it has been noticed, in the past decades, that investors have been interested in this investment vehicle as a result of the diversification that it generally provides and also due to its accessibility. Since ETFs entails a selection of securities, this selection may vary across multiple asset classes, specific or global geographical regions, and even specialized sectors (Mitikka, 2017). This allows investors to gain access to new exposures, for a reduced cost when compared with a self-made portfolio (when containing the same assets) and even when compared against mutual funds due to lower commissions.

Since its introduction to the market, in January 1993 (Elton et al., 2019), in the United States of America and later in Europe, in 1999, ETFs presented to the general public an innovative and differentiated opportunity to invest, as mirrored in a 2008 survey, where the majority of the participants defined this particular investment vehicle as the most innovative investment product of the previous two decades and also, that in their opinion ETFs have reformed the construction of their portfolios (Hull, 2018). The expression of exchange-traded funds in the market have been increasing, especially in the past decade, where since 2010 until 2020, the number of ETFs listed around the world grew by 204%, reaching in last year, 7602 listed products worldwide (Deutsche Bank & ETFGI, 2021), as seen in Figure 3.1 below.

Number of exchange traded funds (ETFs) worldwide from 2003 to 2020

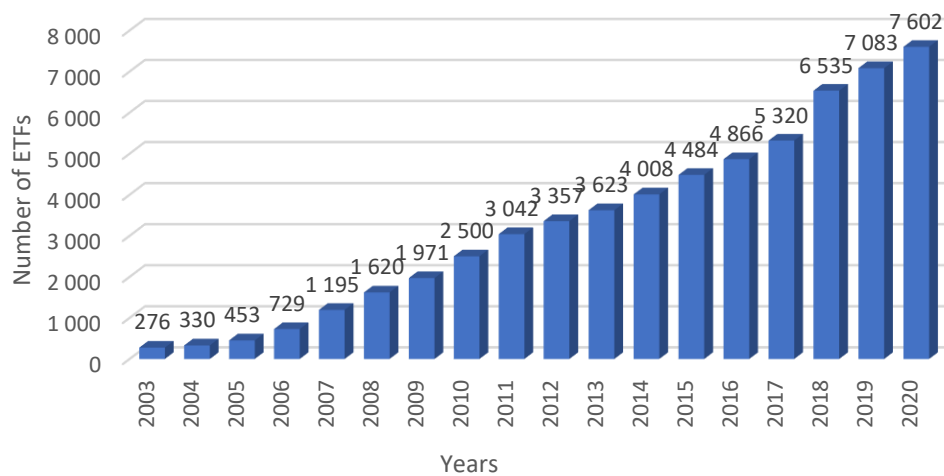


Figure 3.1 - Number of Exchange Traded Funds (ETFs) worldwide from 2003 to 2020
Source: Deutsche Bank & ETFGI, 2021

Specifically, in Europe, the ETF marketplace is also on the rise. According to Lamont (2020), the assets under management (AUMs) in Exchange Traded Funds domiciled in Europe have reached, in the first quarter of 2019, 760 billion euros, representing a more than double increase in the past five years, presented in Figure 3.2 below.

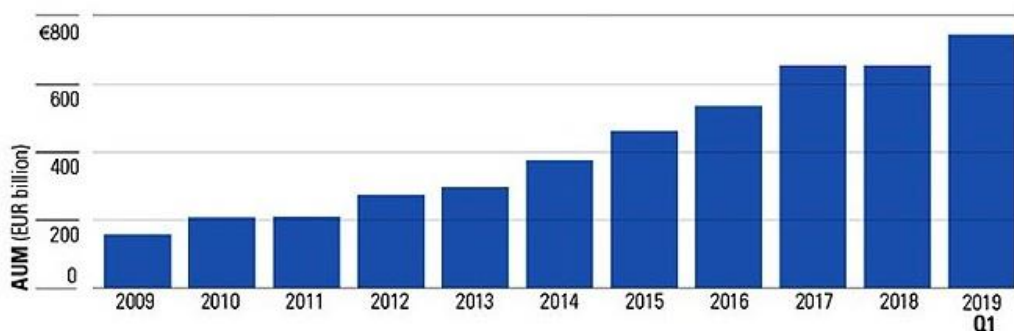


Figure 3.2 - European ETFs AUMs from 2009 to 2019
Source: Morningstar, 2020

3.1.1. Investment Approaches of ETFs

When created, ETFs were designed as an instrument for passive investment, with a mandate to replicate and track a stock index. Passive investing is an investment strategy intended to minimize the buying-selling and the selection of securities (Puelz et al., 2019) and hold it for a long-term horizon. Therefore, the portfolio managers were not actively buying and selling the components of such indexes. By contrast, in 2008, the investment bank Bear Stearns, introduced the actively managed ETFs. These were tailored to outperform the market, instead of just mimicking the behavior of the indexes

(Kim, 2021). Overall, the expression of actively managed ETFs in the market is much lower than passively managed funds (Wallace, 2021).

ETFs can also be characterized by the strategy employed by the asset managers in order to replicate the desired index or portfolio, i.e., the physical and the synthetic replication. The physical replication, as the name entails, requires the physical holding of the selected assets, in the approximate proportion as they appear on the index. (Dickson et al., 2013)

Synthetic replication stands opposite to physical replication, in the sense that, instead of the ownership of the securities in the funds, asset managers use derivative products. Most commonly, it is used total return swaps – also referred as unfunded swap structured – meaning that the issuer of the ETF, contracts a swap, with a counterpart, to receive returns corresponding to the benchmark index. (Naumenko & Chystiakova, 2015)

3.1.2. ETFs' Risks and Costs

Riskiness and commission expenses are critical aspects for any investor to consider, prior to invest in any type of asset class, since it is interconnected to the overall portfolio return performance. ETFs are no different. These particular investment vehicles are, as previously mentioned before, a hybrid investment product and as such it entails types of risk that are transversal to all financial products but also specific forms of risk of its own, as a result of the unique features of these financial instruments. The costs inherent to investing in ETFs, i.e., the commission fees, bring to investors a setback in their returns, meaning that higher fees cause a higher reduction in portfolio returns. Thus, comprehending the risk and costs associated with investing in ETFs is essential to understand and compute possible future returns.

The returns of the ETFs are directly related to the performance of the underlying securities selection that itself is intended to replicate, either being indexes or theme related portfolios. Market risk is a type of risk which is generalized across all traded products. It is linked to the supply and demand (Maginn et al., 2007), since it is defined by the variations in value of these products, i.e., the price. In ETFs, an increase in the underlying assets' prices results in a higher NAV, and therefore higher returns for investor, whereas a decrease in assets' value, ultimately means a reduction in returns. Liquidity risk is another form of risk that associated with all traded products, which reflects the ability of selling or purchasing assets, without compromising cash availability. An ETF is as liquid as its underlying securities (RBC, n.d.). ETFs also face the risk of closure – as mutual funds also face– meaning that the closure of the instrument by the issuer is possible, this translates in the forced liquidation of the fund for the investors - when this happens investors receive the value of their shares after fees and taxes (Mitikka, 2017).

Due to the structural nature of ETFs, these specific financial securities entail specific risks. Since ETFs are commonly designed to track a selected index, and as such, the returns of the investment in these products should reflect the index returns. There might be a deviation from the ETFs' NAV, this can be explained by the commission expenses and also by taxation, and it is known by the tracking error. Another explanation to this difference is, what is normally called by the composition risk, this being the divergence between the fund composition itself and its target index. These divergencies can be

either the weights of securities not being accurately portrait in the portfolio and/or the securities not being properly selected to clone the benchmark index (Mitikka, 2017). Additionally, the European Central Bank (2018) reinforces another form of risk that is associated with Exchange Traded Funds, the counterparty risk. This indicates that ETFs investors need to bear in mind that there is a possibility for the counterpart, i.e., the issuer of the fund, to default. The likelihood of the payment failure by the ETF provider is higher in the case of synthetic ETFs but also physical ETFs investors are exposed to this type of risk, if the counterpart enters in lending securities contracts (European Central Bank, 2018).

Regarding the costs of ETF investing, it has been established before that ETFs are notoriously cheaper than mutual funds. As mentioned before, ETFs present lower expense ratios, and therefore lower management fees, justified by the fact that since ETFs are traded through a broker, rather than being bought directly to the fund management firm, this agents' commission expenses are broadly lower. By doing this, issuers have reduced marketing expenses (Bodie et al., 2014). According to Mitikka (2017), ETFs are commonly considered to be tax efficient. However, this can be affected by the investment strategies used by the asset managers, meaning that different assets get distinctive taxation. This is also presented as risk for the investors, acknowledged as the tax risk. Investors must be conscious about this subject and assess the impact that taxes might have on their returns.

4. METHODOLOGY

4.1. RESEARCH QUESTION

As studied in the previous chapter the importance of Sustainable Investing is indisputable. As seen before, in subchapter 2.2.1. *Drivers of ESG Investing*, the top reason for investors to look to this investment approach is the improvement of long-term returns. As so, the sustainable investing methodology must prove its profitability to ensure the wider market acceptance. Therefore, it is necessary to evaluate whether ESG Investing provides more results, i.e., returns, than their less sustainable counterparts, in order to assess the attractiveness of these strategies.

The relevant studies in this field tend to examine the performance of mutual funds, e.g., Bauer et al. (2005) or Yue et al. (2020). Since ETFs provide many benefits when compared to the traditional mutual funds, as stated before, it is possible that these instruments can provide differences in its performances, as used by Mitikka (2017).

So, the research question for the present study is “Do the sustainable ETFs outperform or underperform when compared with less or unsustainable ETFs?”, being the research hypothesis that they outperform.

4.2. RESEARCH METHODOLOGY

As said, this study is focused on whether sustainable ETFs tend to perform better than unsustainable ETFs. It will be used a quantitative approach to answer the research question, based on the theoretical framework presented in previous chapters.

This research will mostly apply the study structure by Mitikka (2017), who explored the difference in performance of USA domiciled sustainable ETFs and its unsustainable counterparts, and Yue et al. (2020) who evaluated the performance of sustainable mutual funds in Europe. Both authors present the same methodology to assess the risk-adjusted performance according to three factor models.

In accordance to previously referred methods, in this research the performance of a portfolio containing only ETFs with high rating of ESG factors, will be compared against a sample of ETFs with a poorer ESG rating, all rating according to **Morningstar Sustainability Rating**. These portfolios will be constructed under the same criteria, which will be described in the next chapter (5. Data).

The assessment of the risk-adjusted performance will follow a cumulative logic, starting by a one factor model, the Capital Asset Pricing Model (CAPM), and from there it will be added different factors: Firstly, with the addition of two more factors, for the purpose of computing the Fama-French 3-factor model and afterwards it will be added another factor to formulate the Carhart 4-factor model, following the procedure of Bauer et al. (2005) and Yue et al. (2020), afterwards other factors will be included to compute the Fama-French 5-factor model, as seen in Mitikka (2017). From this quantitative analysis will be computed the alphas of the ESG portfolio and the Non-ESG portfolio and also their exposure to the included factors (Mitikka, 2017).

4.2.1. Capital Asset Pricing Model - CAPM

The Capital Asset Pricing Model (CAPM) is a model based in a set of predictions regarding expected returns on risky assets, according to Bodie et al. (2014). It was presented by William Sharpe (1964), John Lintner (1965) and Jan Mossin (1966), who based their model in Harry Markowitz's Modern Portfolio Management Theory, published in 1952. This theory states that the general investor is averse to risk and their main concern, when choosing a portfolio, is the mean and the variance of their investment return (Fama & French, 2003).

This model, seats on the notion that investors are compensated by the time of value of money and also by the asset's risk (Bodie et al., 2014). CAPM implies that the risk premium (the return of the portfolio in excess of the risk-free rate) on a portfolio is the product of the risk premium on the market portfolio and the beta coefficient, being beta (β) the measurement of systematic risk (Sharpe, 1964; Lintner, 1965; Mossin, 1966):

$$E(r_i) - r_f = \alpha_i + \beta[E(r_M) - r_f] \quad (1)$$

Where:

$E(r_i)$ – Expected return of the portfolio i

r_f – Risk-free rate

$E(r_i) - r_f$ – Risk Premium of the portfolio i

β – Asset sensitivity to the market

$E(r_M)$ – Expected return of the market portfolio

$E(r_M) - r_f$ – Risk Premium on the market portfolio

The Equation (1), is commonly presented as it follows:

$$E(r_i) = r_f + \beta[E(r_M) - r_f] + \alpha_i \quad (2)$$

In the previous formulas, Equation (1) and (2), “Alpha” (α_i) is a measurement of the return beyond the value that would be forecasted from the market's return and the systematic risk of the portfolio (Bodie et al., 2014), created in 1968 by Micheal C. Jensen in his study of mutual funds' performance (Mitikka, 2017). Although the CAPM remains widely used across the industry - mostly because it presents itself as an intuitive model to formulate predictions regarding the measurement of risk and its relationship with the expected return – this model reflects some flaws due to the simple assumptions that entails (Fama & French, 2003).

4.2.2. Fama-French 3 Factor Model

In order to better comprehend and detect origins of risks besides macroeconomic factors, in 1992 Eugene Fama and Kenneth French developed the Fama-French Three-Factor Model. Built from CAPM, this model includes company features as factors that based on past evidence seem to be related with returns and therefore may capture risk premiums (Bodie et al., 2014). The incorporation of the new factors into the Capital Asset Pricing Model (CAPM), i.e., the Fama-French Three-Factor Model, proves

to enhance the measurement of the performance, providing an explanation to 90% of the portfolio returns, against the mean 70% explanation given by the one-factor model (Jackson, 2018).

$$E(r_i) - r_f = \alpha_i + \beta_1[E(r_M) - r_f] + \beta_2SMB_t + \beta_3HML_t \quad (3)$$

According to the Fama-French 3-Factor Model equation, Equation (3), affirms that the expected excess return of a portfolio is also dependent on **SMB** (“Small Minus Big”), i.e., the return of a portfolio of small stocks in excess of return on a portfolio of large stocks, according to market capitalization, and **HML** (“High Minus Low”), which is the return of a portfolio of stocks with a high book-to-market ratio in excess of the return on portfolio of stocks with a low book-to-market ratio (Bodie et al., 2014). These added variables may not be identified as risk factors, instead they may be proxies for macroeconomic risk sensitivity (Mitikka, 2017).

4.2.3. Carhart 4-factor Model

In 1997, Mark Carhart developed the Carhart Four-Factor Model by extending the Fama-French Three-Factor Model, including another the momentum anomaly factor. The one-year momentum anomaly studied by Jegadeesh and Titman (1993) was therefore integrated in the model, with the purpose of illustrate the “cross-sectional variation in momentum-sorted portfolio returns” (Bauer et al., 2005).

Carhart (1997), computed the following formula, Equation (4), for the expected excess return for the portfolio:

$$E(r_i) - r_f = \alpha_i + \beta_1[E(r_M) - r_f] + \beta_2SMB_t + \beta_3HML_t + \beta_4MOM_t \quad (4)$$

where **MOM** stands for the momentum factor, i.e., is the difference in returns of a portfolio with stocks with higher returns in the last 12 months against a portfolio of stocks with lower returns in the same market period. (Yue et al., 2020)

4.2.4. Fama-French 5 Factor Model

In 2015, Eugena F. Fama and Kenneth R. French, presented another asset pricing model, the Fama-French 5-Factor Model. This model translates in a complement to the previous model, the Fama-French 3-Factor Model above, enlarging it to include an extra set of factors, i.e., two more factors, the profitability and investment.

With the Equation (5) below, Fama and French affirm that the expected return of the portfolio i in excess of the risk-free rate, is:

$$E(r_i) - r_f = \alpha_i + \beta_1[E(r_M) - r_f] + \beta_2SMB_t + \beta_3HML_t + \beta_4RMW_t + \beta_5CMA_t \quad (5)$$

The 5-Factor Model adds to the previously mentioned factors – the size, explained by the **SMB** factor and the value, represented in the **HML** factor – the profitability factor, embodied in **RMW** (“Robust minus Weak”) in Equation (5), which is the difference of returns between stock’ portfolios with a robust and a weak profitability and the investment factor, the **CMA** (“Conservative minus Aggressive”) that is the difference of returns between portfolios of stocks of low investment firms and high investment firms, described as conservative and aggressive, respectively. In this model the calculation of the SMB variable differs from the Three-Factor Model, which is determined here, by the difference between

the average returns of nine small stock portfolios and the average returns of nine big stock portfolios. (Mitikka, 2017)

According to Mitikka (2017), the inclusion of these two factors in the Fama-French Three-Factor Model, i.e., the Fama-French Five-Factor Model, proves to be a better fit for the measurement of the asset performance. Nevertheless, this model fails to seize the low average returns from small stocks that are approximated to the returns of corporations with high investments but with low profitability (Fama & French, 2015).

5. DATA

This chapter introduces the data in which the before mentioned methodology will be applied. It will be used two samples: The ESG portfolio, corresponding to the sample of sustainable ETFs and the Non-ESG Portfolio, in relation to the unsustainable ETFs sample.

As disclosed in the previous chapter (4. Methodology), the literature referring to the comparison of performance of sustainable funds and of unsustainable funds (funds, meaning either ETFs or mutual funds), tend to examine the performance in the same period of time, e.g., 2012-2018. Hence the representation of more recent data is important, and it is also interesting to include a period of time that covers a period where the market is considered highly volatile, as it happened in March and April of 2020. So, our sample period is from the 31st of October 2016 to the 31st of October 2020, i.e., 4 years.

As a mean to ensemble our database, it was used the Bloomberg Terminal to extract the list of ETFs. The representative Exchange Traded Funds are all restricted to European and Eurozone equity ETFs, domiciled in European countries with the funds' currency being only Euro. The data extracted is also limited to primary issued ETFs, meaning that replicates funds. Moreover, the sample only contains ETFs whose inception date is prior to the 31st of October of 2016. Following the described criteria, the total sample of ETFs translates to 154 ETFs.

5.1. THE ESG AND NON-ESG PORTFOLIOS

In order to compare the performance of sustainable and unsustainable ETFs, it was necessary to assess the rating of sustainability of each ETF. For this purpose, it was employed the Morningstar Sustainability Rate (a rating system, with five classifications of risk levels, from 1 to 5, being 5 the best rating), whereas the ETFs with a rating of 1 to 3, were included in the Non-ESG Portfolio, and the ETFs with a rating above or equal to 4 (i.e., 4 and 5) were assigned to the ESG Portfolio.

To summarize, on one hand, the ESG Portfolio, equals to 85 ETFs, whereas 54% of the sample is classified with the second-best rate of 4 globes in the Morningstar Sustainability Rating and 46% of the ETFs are rated with the best score of 5 globes (in Figure 5.1). On the other hand, the Non-ESG Portfolio is composed of 69 ETFs, where only 3 funds had the worst classification of 1 globe, representing 4% of the sample, 32% of the ETFs are classified with a rating of 2 globes, meaning that the remaining 64% of the portfolio is classified with a score of 3 globes in the rating system, in Figure 5.2, below.

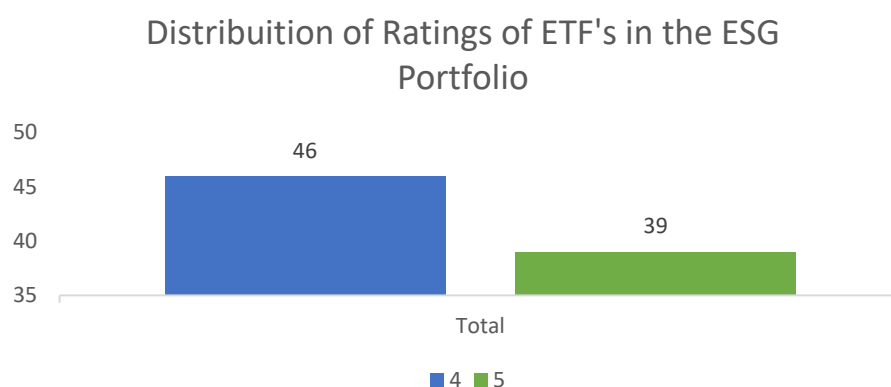


Figure 5.1 - Distribution of rating of ETFs within ESG Portfolio

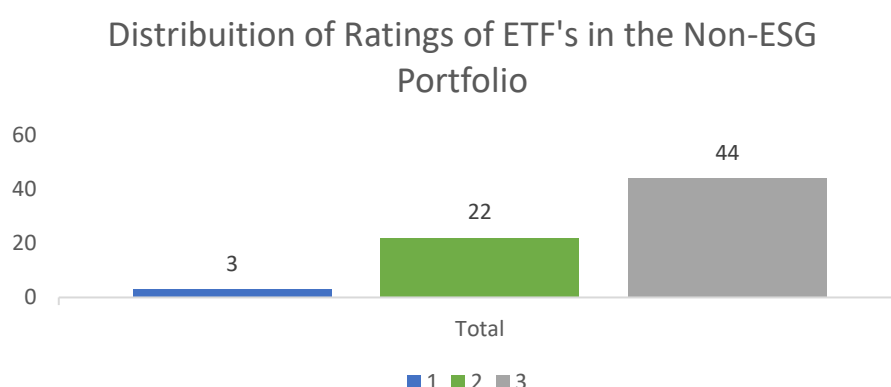


Figure 5.2 - Distribution of rating of ETFs within Non-ESG Portfolio

Afterwards, the ETFs' individual features were collected, retrieved from the Morningstar Database, to better illustrate the differences between portfolios. Initially, the inception dates of the ETFs are gathered, and the respective age of the ETFs computed. Next, the fund size of each ETF and their total expense ratio (TER) are collected.

To analyze the performance of the portfolios, it is required to calculate the returns of each component and after compute the return of each equal-weighted portfolio. With the intention of determine the returns of each portfolio, the monthly adjusted prices (meaning that the closing price of each month is amended to mirror any corporate action that can affect the security price, e.g., stock splits and dividends) are obtained, from Refinitiv Eikon Terminal, for the 48 months, i.e., the 4 years period of this study. Following the previous methodology used by Bauer et al. (2005), Bechetti et al. (2015), Mitikka (2017) and Yue et al. (2020), both portfolios are equally weighted.

5.2. SUMMARY STATISTICS

Prior to subject the sample to the mentioned methodology, a preliminary analysis of the portfolios' characteristics will be conducted.

Portfolios	Returns (%)	St. Deviation (%)	Fund Size (in million USD)	TER (%)	Age (in years)
ESG	0,37	3,95	575,45	0,30	11,93
Non-ESG	0,15	4,20	646,11	0,31	11,38
EUROSTOXX600	0,75	3,88			

Table 5.1 - Summary Statistics of the Sample of ETFs.

For study purposes, the EUROSTOXX 600 Index will be used as a benchmark and a proxy of the Market Portfolio in further computations of portfolio returns, which is an index composed by the 600 most traded and highly valued European Stocks, traded across European stock exchanges.

In Table 5.1 above, is presented a summary statistic of the sample portfolios, retrieved from the previously mentioned databases. According to this, in the studied period, none of the constructed portfolios have outperformed the EUROSTOXX 600 benchmark, based on the average monthly return of the portfolios. However, ESG Portfolio outperformed when compared with the Non ESG Portfolio (0,37% and 0,15%, respectively).

Regarding the standard deviation, i.e., volatilities, the ESG Portfolio presents itself as a less risky in comparison with Non ESG Portfolio, due to its lower standard deviation. Still the volatility of the EUROSTOXX 600 index, is even lower than the sample portfolios (3,88%). This result is aligned with previous studies, such as Yue et al. (2020).

Table 5.1 also allows us to understand that average fund size of the ETFs in the ESG Portfolio is lower than the average size of the ETFs of the Non ESG Portfolio. We can observe that the the ESG ETFs are, on average, older when compared against the Non-ESG ETFs, although the difference is not that significative. The expense ratio, or TER, as it is commonly known, is higher in the Non-ESG Portfolio. Again, the results of this analysis are consistent with Mitikka (2017).

	ESG Portfolio	Non ESG Portfolio
Kurtosis	4,801	5,074
Skewness	-1,593	-1,653

Table 5.2 - Kurtosis and Skewness of the sample portfolios

It is important to examine the risk of higher specific returns in both portfolios. As demonstrated in Table 5.2 above, the Kurtosis, which measures the peakedness of distribution (Mitikka, 2017), shows a high value, either in ESG Portfolio and Non-ESG Portfolio, being the distributions of returns from both portfolios leptokurtotic i.e., it demonstrates a positive excess of kurtosis. This means that the two portfolios are likely to experience extreme values of returns on either side of the distribution of returns. As to Skewness, i.e., the fatness of the tail of the distribution (Brooks, 2014), of both the sample portfolios, reveal an asymmetry in the distribution, both distributions of returns are negatively skewed. Both analyses reveal that there is a big risk related to asymmetry in the returns.

6. RESULTS AND DISCUSSION

In this section will be presented the results, from the referred pricing models in chapter 3. It starts with the one-factor model (CAPM), and afterwards more factors were added to apply the multifactor models.

6.1. CAPM

As declared before, our study will start by the computation of excess returns of the portfolio through the one-factor model, i.e., CAPM. According to Bauer et al. (2005), the Capital Asset Pricing Model (CAPM), is the main model used to calculate the performance of portfolios. The excess return of portfolio is obtained by a linear regression. As mentioned before, it was used as a market “proxy” the EUROSTOXX 600 index and for the risk-free rate “proxy” the risk-free rate captured from Professor Kenneth French’s database.

CAPM Results			
Portfolios	Alpha	R _m -R _f	R ²
ESG	0,141%	0,9982*	0,995
Non-ESG	0,197%	1,024*	0,995

Table 6.1 - Results from One-factor model (CAPM)

In Table 6.1 above, demonstrates the results of applying CAPM, i.e., Equations (1) and (2), on the portfolios. $R_m - R_f$ represent the excess return of the market “proxy” selected for the tests, i.e., in excess of the risk-free rate. For each portfolio it was computed the Jensen’s Alpha, which represent the average return that surpasses the forecasted portfolio returns through the model (Mitikka, 2017). These were computed with 3 significance levels: 1%, 5% and 10%. Therefore, the stars pictured above and from now on, denote different significance levels, where “*” means that the value is significant for a 1% level, “**” means that is significant for a 5% level, and subsequently “***” represents that is significant for 10% level.

From the CAPM analysis we can observe that the ESG and Non-ESG Portfolios’ Alphas are not statically significant at neither of the significance levels, therefore, there is no evidence that support the out/underperformance of any of the studied portfolios. In terms of the beta coefficient for the excess markets return ($R_m - R_f$), both coefficients are positive and statistically significant at 1% level. Although, the difference between portfolios is very small, we can observe that the Non-ESG Portfolio is more sensitive to market fluctuation, this suggests that an increase of 1% in market portfolio value will result in an increase of 1,024 % of the Non-ESG portfolio’s returns and a 0,9982% increase in the sustainable portfolio.

6.2. FAMA-FRENCH 3-FACTOR MODEL

After the computation of the Capital Asset Pricing Model (CAPM), as it was proposed previously, the analysis of the excess returns of the sample portfolios will now be conducted through multifactor models. Firstly, it will be carried the Fama-French 3-factor model, and afterwards the Carhart 4-factor model and Fama-French 5-factor model. As previously done for the 1-factor model, the Jensen's Alpha was calculated for the ESG and Non-ESG Portfolio.

As it was expected, from previous literature, e.g., Bauer et al. (2005), the multifactor models, tend to better assess the excess returns, exposed by the higher R squared values in the next computations, when compared with the CAPM.

Fama-French Three-Factor Model Results					
Portfolio	Alpha	$R_m - R_f$	SMB	HML	R^2
ESG	0,120%	0,996*	0,0001	0,0001	0,995
Non-ESG	0,030%	1,0022*	0,0016*	0,0012*	0,997

Table 6.2 - Results from 3-factors model (Fama-French Three-Factor Model)

Table 6.2 above, summarizes the results of the Fama-French 3-factor model, by applying the Equation (3). In line with the previous model, the Alphas of ESG and Non-ESG Portfolios are still statistically insignificant for any significance level. By using this model, we can see that our portfolios are less sensitive to market exposure, by the slight decrease in the beta coefficients ($R_m - R_f$) statically significant at 1% level, when compared against the one-factor model. Although the change is practically immaterial, the ESG Portfolio still presents itself as less affected by market changes, when compared against the Non-ESG portfolio, the results mean that a 1% increase in market portfolio valuation, will eventually lead to an increase of 1,0022% in the Non-ESG portfolio returns and a 0,996% increase in the ESG portfolio, which are coherent with previous studies such as Bauer et al. (2005).

Regarding the factors added in this model, i.e., "SMB" and "HML", both are statically significant for the Non-ESG model for the 1% significance level, but not significant for the ESG portfolio at any given level. The size factor, i.e., "SMB", suggests that an increase of 1% in market capitalization would increase the returns of this ETFs by 0,0016%, therefore is economically insignificant. Again, the result for the value factor, i.e., "HML", shows no economic significance, since its value is 0,0012%.

6.3. CARHART 4-FACTOR MODEL

The Table 6.3 below, presents the results from the second multifactor model used, the Carhart 4-factor model, by applying Equation (4). Like the previous models, this model shows no statistically significance for the Jensen's Alphas calculated. The beta coefficient is coherent with previous results, both positive and the ESG portfolio proving to be less sensitive to market exposure.

Similar to Fama-French 3-factor model, the SMB, HML factors show no significance at any level for the ESG Portfolio and in line with the previous model, being both significant for the Non ESG Portfolio. The momentum factor added in this 4-factor model, the MOM factor, is only significant at a 10% level for

the Non ESG Portfolio. The value of this factor is negative for the unsustainable portfolio which can indicate that the returns of low-rating ETFs are opposed to the “positive association momentum expects” (Mitikka, 2017), this suggests that when the return momentum increases by 1%, the returns of the Non-ESG portfolio will, most likely, decrease by 0,006%, although the difference between them is insignificant.

Carhart Four-Factor Model Results						
Portfolio	Alpha	$R_m - R_f$	SMB	HML	MOM	R^2
ESG	0,134%	0,9971*	0,0001	0,0001	0,0001	0,995
Non-ESG	0,088%	1,0017*	0,0016*	0,0011*	-0,0006***	0,997

Table 6.3 - Results from 4-factor model (Carhart Four-Factor Model)

6.4. FAMA-FRENCH 5-FACTOR MODEL

The final model to be used in the research is, as mentioned before, the Fama-French 5-factor model.

Fama-French Five-Factor Model Results							
Portfolio	Alpha	$R_m - R_f$	SMB	HML	RMW	CMA	R^2
ESG	0,029%	0,9902*	-0,0002	0,0013***	0,0014	-0,0016	0,995
Non-ESG	0,097%	1,0044*	0,0016*	0,0016*	0,0018***	0,0009	0,997

Table 6.4 - Results from 5-factor model (Fama-French Five-Factor Model)

The Table 6.4 above, demonstrate the results of the application of the referred model, by applying the Equation (5) on our dataset. In this model, similarly to the previous models, the Jensen’s Alphas are still not significant at any level for any of the studied portfolios. Regarding the “ $R_m - R_f$ ” or beta coefficient, once again the results are consistent with the results in the previous models, thus the ESG ETFs tend to be less sensitive to increases in market capitalization

The size factor, or SMB factor, is once again only significant for the Non-ESG portfolio, however, in this model, the size factor shows a negative value for the ESG Portfolio. Nonetheless, the significant coefficient implies that 1% increase in the market capitalization would increase the Non-ESG portfolio’s returns by 0,0016%, which in economically insignificant.

Contrary to the previously studied models, the 5-factor model shows a significance for 10% and 1% level, for the value factor, i.e., HML factor, for the ESG portfolio and Non-ESG portfolio, respectively. These results show no economic significance since they have a small value and also a small difference between them. Anyway, the factor loading indicates that an increase of 1% in book-to-market - a ratio

that measures a companies' book value to its market valuation – would mean an increase of 0,0013% and 0,0016% in the returns of the ESG and Non-ESG portfolios, respectively.

Moreover, the profitability factor, i.e., RMW, shows significance only for the Non-ESG portfolio at a 10% level. The result implies that a 1% increase in operating profitability would result in a 0,0018% increase in the unsustainable portfolio returns. This mention factor is again not economically significant. As the investments factor, i.e., CMA is not significant at any given level, for both portfolios, so no further conclusions can be drawn.

7. CONCLUSIONS

We have seen in recent years an increase in ESG Investing, where both investors and finance institutions have considered the importance of sustainability in their investments. The proliferation of ESG oriented solutions is notable in the past decade, revealing that these topics are no longer a trend in the financial sector but starting to come across as a multisector common practice. Nevertheless, ESG Investing has still a long way to run. As shown in this research, the main factor for asset managers and investors to be conscientious about sustainable “strategies” is the expectation of increased long-term returns, proved by BNP Paribas (2019). Europe has been a key driver for change and acceptance of sustainable assets, being represented in several reports as the biggest market in the world for these specific assets, according to, for example, GSIA (2019). Thus, utilizing a strictly European equity ETFs database, composed by 154 ETFs, this study examined and compared the performance of high ESG rating ETFs against low ESG rating ETFs. For the purpose of this study, two portfolios were created, differentiated only by the level of ESG rating with the sample period being from 31st of October 2016 to 31st of October of 2020.

The study started by computing the monthly returns of both portfolios and conducting a preliminary statistic to assess the average return of the portfolios as well as the level of risk of each, i.e., the standard deviation. During the studied period, the ESG portfolio, whose components are limited to the two highest levels of the Morningstar Sustainability Rating, were considered to be less risky when compared against the Non-ESG portfolio, composed by ETFs with the three lowest rating levels in the Morningstar Sustainability Rating, and also have generated higher average returns.

In order to assess the performance of each portfolio, this study focused on previous methodologies used by a variety of authors. It started by using a 1-factor model, the CAPM, then it was employed the multifactor models, with the purpose of obtaining more insightful results. Firstly, it was used the Fama-French 3-factor model, which included the “Small minus Big” and “High minus Low” factors to the previously used model, then the Carhart 4-factor model was utilized, whose formula adds another factor, the “Momentum” factor and afterwards the Fama-French 5-factor model, which adds to the three-factor model, the “Robust minus Weak” and “Conservative minus Aggressive” factors.

All models used were consistent with each other, as the power of explanation is similar. The Jensen’s Alphas calculated were not significant in any of the performed studies, therefore no evidence was found that support our hypothesis of the ESG portfolio outperform its less sustainable counterpart.

In the multifactor models analyzed, the added factors were not significant for the ESG portfolio, excluding in the HML (High minus Low factor) in the Fama-French 5-factor model, thus we can affirm that this model show the best explanation power among the studied models. This means that the models offered no significant explanation for the biggest contributor to the returns of this specific portfolio.

However, we can observe that the in all four cases, the models shows that the returns of the market portfolio are the biggest contributor for the returns of the Non-ESG portfolio, revealed by higher values for the beta coefficient. These results also demonstrate that sustainable ETFs are less exposed to market variabilities, when compared against its unsustainable counterparts, thus being able to be perceived as more defensive or less risky assets in normal market conditions. The results obtained are contrary with previous literature, e.g., Mitikka (2018) and Yue et al. (2020) – whose results implied that

sustainable ETF and mutual funds are, respectively, more exposed to the variations in the market portfolio returns – but are in line with the research conducted by Bauer et al. (2005) who reached a similar conclusion.

Furthermore, it is possible to conclude that most of the mentioned factors, which are statically significant, reveal a positive effect on the returns of the studied portfolios, mostly in the Non-ESG portfolio. For example, the size factor, i.e., SMB, has a positive influence on the returns of the unsustainable portfolio, this means that an increase in company size is related to an increase in the returns of the portfolio. The value factor – HML – also demonstrated to have a positive consequence on the returns of the on both portfolios, as seen in the Fama-French 5-factor model, revealing that higher book-to-market ratios contribute to higher returns. The profitability factor, or RMW, showed that increasing the operating profitability can also lead to higher returns in the unsustainable portfolios. Contrary to these results, the momentum factor, MOM, is negatively associated with the returns of the Non-ESG portfolio.

8. LIMITATIONS AND RECOMMENDATIONS FOR FUTURE WORKS

As mentioned in the introduction (Chapter 1), this study aims to analyze and interpret if adding the sustainability factor into the investment process adds value to investors in general, by enhancing their return on investments. There are several studies regarding this subject, but a few have covered the use of ETFs, especially European domiciled ETFs focused on European equity. Although, the European ETFs market has grown in the last decade, its size is still reduced, especially when compared against the USA ETFs market. As such, the sample of ETFs obtained – limited to the last 4 years, i.e., from the 31st of October 2016 to the 31st of October 2020 – is smaller than samples obtained in previous studies. This might have had an impact on the obtained results.

Throughout this research, the sustainability factor of the sample of ETFs is measured according to the Morningstar Sustainability Rating. The use of this rating presents a convenient and comfortable approach to evaluate this topic and enables concerned investors to better select their investments according to their personal intentions. However, the use of rating can present some flaws. The rating in question, assesses the rating of each fund by peer comparison from the same Morningstar Category, thus utilizes the best-in-class strategy for attributing its score. This means that, within each category, there is the possibility that exists funds that are invested in some questionable companies and still receive a high rating of ESG. Therefore, this study is entirely dependent on the assessment made by Morningstar, Inc., and the perception of how sustainable the ETFs are, is conditioned to the evaluation made by the rating methodology.

Another major limitation found during the elaboration of the present study, was the access to full disclosed information on the sample of ETFs within the defined universe. Since the most useful and practical tools used to collect the data in this research, e.g., Bloomberg Terminal and Refinitiv Terminal, are not available to the public, the gathering of the necessary data is very complex, not user-friendly and most of the resources available require a monthly or annual subscription and payment of premium tools which may difficult this process. Also, the taxonomy used by information providers is different and thus the data crossing can be hard to understand.

As a future work suggestion, it would be interesting to analyze and focus on other markets beside the European Capital Markets and the USA Capital Markets, which are already very explored. A possible and curious theme would be to study the performance of Sustainable Assets within any major Asian Market since during the preparation of the study the lack of information related to any of these markets was very surprising.

By pursuing this suggestion, not only would be possible to fill the gap of information regarding the Asian Market related to ESG Investing but also it would be possible to grasp on the general panorama of how the Emerging Markets are dealing and/or managing the sustainable assets.

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10.APPENDIX

Table 10.1 - ESG Portfolio Constituents

ESG Portfolio Constituents								
ISIN	Name	Ticker	Inception Date	Currency	Morningstar Sustainability Rating	Age (in years)	TER (%)	Fund Size (in Millions USD)
IE00BFTWP510	SPDR EURO STOXX LOW VOL ETF	ZPRL	24/03/14	EUR	4	7	0,3	83,69
LU0292106084	X STOXX600 INDUSTRIALS SWAP	DXSL	13/07/07	EUR	5	13	0,3	29,99
LU0292104030	X STXX EUROPE TELECOMMS SWAP	DXSG	13/07/07	EUR	4	13	0,3	5,08
LU0292101796	X STOXX600 OIL & GAS SWAP	DXSD	13/07/07	EUR	4	13	0,3	33,9
LU0292103222	X STOXX600 HEALTH CARE SWAP	DXSE	13/07/07	EUR	5	13	0,3	85,54
LU0292104469	X STXX EUROPE TECHNOLOGY SWAP	DXSH	13/07/07	EUR	5	13	0,3	45,32
LU0292104899	X STXX EUROPE UTILITIES SWAP	DXSI	13/07/07	EUR	5	13	0,3	16,41
IE00B5MTZM66	INVESCO STX 600 OPT RETAIL	SC05	03/07/09	EUR	5	12	0,3	2,93
IE00BP8FKB21	X FTSE EUROPE X UK R ESTATE	XREA	22/09/14	EUR	4	6	0,33	27,26
IE00B5MTZ595	INVESCO STX 600 PERS & HOUSE	SC04	06/07/09	EUR	5	12	0,3	4,65
IE00B5MTY309	INVESCO STX 600 OP CONSTRUCT	SC01	03/07/09	EUR	4	12	0,3	3,75
IE00B5MJYX09	INVESCO STX 600 OPT IND GOOD	SC05	03/07/09	EUR	5	12	0,3	1,99
IE00B5MTZ488	INVESCO STX 600 OPT MEDIA	SC06	03/07/09	EUR	5	12	0,3	35,21
IE00B5MJYB88	INVESCO STX 600 OPT TELECOM	SC0Q	03/07/09	EUR	4	12	0,3	2,83
IE00B5MTXJ97	INVESCO STX 600 INSURANCE	SC0Y	03/07/09	EUR	5	12	0,3	134,45
IE00B5MTYK77	INVESCO STX 600 OPT FINANCE	SC02	03/07/09	EUR	5	12	0,3	4,93
LU0322253732	X MSCI EUROPE MID CAP	DX2I	10/01/08	EUR	5	13	0,25	43,37
LU0274211217	X EURO STOXX 50 1D	XESX	04/01/07	EUR	4	14	0,09	7110,91
IE00B5MTWH09	INVESCO STX 600 OIL & GAS	SC0V	03/07/09	EUR	4	12	0,3	8,28
IE00B5MJYY16	INVESCO STX 600 OP HEALTHCAR	SC0T	03/07/09	EUR	4	12	0,3	29,74

LU0292095535	X EURO STOXX QLY DIV	XD3E	14/06/07	EUR	4	14	0,3	281,9
IE00B5MTWZ80	INVESCO STX 600 OPT TECHNOL	SC0X	03/07/09	EUR	5	12	0,3	9,21
IE00B5MTXK03	INVESCO STX 600 UTILITIES	SC0Z	27/07/09	EUR	5	11	0,3	7,08
IE00B5MTY077	INVESCO STX 600 CHEMICALS	SC00	28/07/09	EUR	5	11	0,3	9,88
LU1215454460	UBS ETF FACTOR EMU LOW VOLTL	UIMY	22/09/15	EUR	5	5	0,28	61,77
LU0629460675	UBS ETF MSCI EMU SRI	UIMR	29/08/11	EUR	5	9	0,22	2311,56
LU1215451524	UBS ETF FACTOR EMU QUALITY	UIM2	22/09/15	EUR	5	5	0,28	169,13
NL0009272749	VANECK AEX UCITS ETF	TDT	14/12/09	EUR	4	11	0,3	209,24
DE000A0D8Q07	ISHR EUROSTOXX UCITS ETF DE	SXXEEX	12/05/05	EUR	4	16	0,2	1931,76
DE000A0H08P6	ISHARES EUROPE600 RETAIL DE	EXH8	22/07/02	EUR	5	18	0,46	38,26
DE000A0H08N1	ISHR EUR600 PERSNL&HOUSE DE	EXH7	22/07/02	EUR	5	18	0,46	106,03
DE000A0H08F7	ISHR EUR600 CNSTRN&MTRLS DE	EXV8	22/07/02	EUR	4	18	0,46	156,83
DE000A0H08J9	ISHR EUR600 IND GDS&SERV(DE)	EXH4	22/07/02	EUR	5	18	0,46	545,6
DE000A0H08L5	ISHARES EUR 600 MEDIA (DE)	EXH6	22/07/02	EUR	5	18	0,46	18,03
DE000A0H08R2	ISHARES EUR 600 TELECOMS DE	SXKPEX	04/05/01	EUR	4	20	0,46	652,02
DE000A0H08K7	ISHARES EUR600 INSURANCE(DE)	SXIPEX	22/07/02	EUR	5	18	0,46	311,16
DE000A0H08G5	ISHR EUR600 FIN SERVICES DE	EXH2	22/07/02	EUR	5	18	0,46	72,55
DE000A0H08M3	ISHR EUROPE600 OIL & GAS DE	SXEPEX	22/07/02	EUR	4	18	0,46	1266,1
DE000A0Q4R36	ISHR EUR 600 HEALTH CARE(DE)	SXDPEX	04/05/01	EUR	4	20	0,46	665,2
DE000A0H08Q4	ISHR STOXX EUR 600 TECH DE	EXV3	04/05/01	EUR	5	20	0,46	292,12
DE000A0Q4R02	ISHARES EUR 600 UTILITIES DE	EXH9	22/07/02	EUR	5	18	0,46	248,35
DE0005933956	ISHARES CORE EURO STOXX50 DE	SX5EEX	03/01/01	EUR	4	20	0,1	5842,98
DE000A0H08E0	ISHARES STOXX EUR600 CHEM DE	EXV7	22/07/02	EUR	5	18	0,46	135,9
DE000A0F5UG3	ISHR DJEUR SUSTAINABILITY DE	EXXV	11/04/06	EUR	4	15	0,41	168,43

IE00BKWQ0G16	SPDR EUROPE FINANCIALS	STZ	05/12/14	EUR	4	6	0,3	593,23
IE00BKWQ0H23	SPDR EUROPE HEALTH CARE	STW	05/12/14	EUR	4	6	0,3	452,44
IE00BKWQ0P07	SPDR EUROPE UTILITIES	STU	05/12/14	EUR	5	6	0,3	302,61
IE00BKWQ0N82	SPDR MSCI EUROPE COMMS	STT	05/12/14	EUR	5	6	0,3	35,37
IE00BKWQ0C77	SPDR EUROPE CON DISCRETIONRY	STR	05/12/14	EUR	5	6	0,3	161,2
IE00BKWQ0J47	SPDR EUROPE INDUSTRIALS	STQ	05/12/14	EUR	5	6	0,3	486,89
IE00BKWQ0L68	SPDR EUROPE MATERIALS	STP	05/12/14	EUR	4	6	0,3	67,26
IE00BKWQ0K51	SPDR EUROPE TECHNOLOGY	STK	05/12/14	EUR	5	6	0,3	65,51
DE000A0Q4R44	ISHR EUR600 REAL ESTATE (DE)	EXI5	26/09/06	EUR	5	14	0,46	79,05
IE00B60SWZ49	INVESCO STOXX EUROPE SMALL	SDJSML	30/03/09	EUR	4	12	0,35	2,35
IE00B60SX063	INVESCO STX EUROPE MID 200	SDJMID	30/03/09	EUR	4	12	0,35	5,38
IE00B60SWX25	INVESCO EURO STOXX 50 ACC	SDJE50	18/03/09	EUR	4	12	0,05	306,25
DE0002635281	ISHARE EUR STOXX SELDIV30 DE	EXSG	12/05/05	EUR	4	16	0,31	705,33
DE000A0D8QZ7	ISHARES STOXXEURSMALL200 DE	EXSE	04/04/05	EUR	4	16	0,2	583,55
FR0011869304	LYXOR PEA FTSE E/N-D-EUR	PMEH	17/06/14	EUR	4	7	0,4	13,2
IE00B86MWN23	ISHARES EDGE MSCI ERP MINVOL	MVEU	03/12/12	EUR	4	8	0,25	806,46
LU0908501215	LYXOR CORE EURSTX50 DR	MSED	25/04/13	EUR	4	8	0,07	361,51
FR0007054358	LYXOR EUROSTOXX 50 DR	MSE	21/03/01	EUR	4	20	0,2	4192,86
LU0908501058	LYXOR CORE EURSTX300 DR	MFED	25/04/13	EUR	4	8	0,07	388,35
IE00B52VJ196	ISHARES MSCI EUROPE SRI	IUSK	18/07/11	EUR	5	9	0,2	3525,47
IE00BCLWRD08	ISHARES MSCI EMU MID CAP	IS3H	24/09/13	EUR	5	7	0,49	201,72
LU1598688189	LYXOR MSCI EMU GROWTH DR	GWT	13/04/05	EUR	5	16	0,4	54,65
IE0008471009	ISHARES CORE EURO STOXX 50	EUN2	03/04/00	EUR	4	21	0,1	4155,43
DE000ETFL029	DEKA EURO STOXX 50 UCITS ETF	EL4B	31/03/08	EUR	4	13	0,15	1049,82

DE000ETFL078	DEKA EURO STOXX SELECT DIVID	EL4G	30/06/09	EUR	4	12	0,3	204,06
DE000ETFL292	DEKA MSCI EUROPE MC UCITS ET	EL43	16/06/09	EUR	5	12	0,3	14,01
FR0012739431	BNP P EURO STOXX 50 UCITS	ETDD	27/07/15	EUR	4	5	0,18	449,74
DE000ETFL474	DEKA OEKOM EURO NACHHALTIGKT	ELFB	18/08/15	EUR	5	5	0,41	89,95
DE000ETFL466	DEKA EURO STOXX 50 ESG ETF	ELFA	18/05/15	EUR	4	6	0,15	33,11
IE00BZ56TQ67	WISDOMTREE EUZ QTY DIV GRWTH	EGRA	05/07/16	EUR	5	5	0,29	25,75
LU1291091228	BNP P FTSE EPRA/NAREIT EURP	EEP	05/02/16	EUR	4	5	0,4	228,89
LU0192223062	BNP P FTSE EPRA/NAREIT EURO	EEE	07/07/04	EUR	4	16	0,4	533,33
DE000ETF9504	LYXOR 1 EURO STOXX 50	E950	27/11/15	EUR	4	5	0,15	32,24
LU0136234068	UBS ETF EURO STOXX 50	UIM1	13/11/01	EUR	4	19	0,15	402,97
FR0010150458	BNP P CAC 40 UCITS ETF	E40	17/03/05	EUR	4	16	0,25	240
LU0489337690	X FTSE EUROPE REAL ESTATE	D5BK	22/03/10	EUR	4	11	0,33	606,04
IE00B53L3W79	ISHARES CORE EURO STOXX 50	CSSX5E	26/01/10	EUR	4	11	0,1	3879,05
FR0010655712	AMUNDI ETF DAX UCITS ETF DR	CG1	16/09/08	EUR	4	12	0,1	171,37
FR0010655704	AMUNDI ETF MSCI FRANCE UCITS	CF1	16/09/08	EUR	4	12	0,25	90,27
LU0378434236	LYXOR EURO STOXX 30 DIVIDEND	C051	05/09/08	EUR	4	12	0,25	74,2
LU0392496260	LYXOR MSCI EUROPE MID CAP	X025	05/12/08	EUR	5	12	0,35	21,33

Table 10.2 - Non-ESG Portfolio Constituents

Non- ESG Portfolio Constituents								
ISIN	Name	Ticker	Inception Date	Currency	Morningstar Sustainability Rating	Age (in years)	TER (%)	Fund Size (in Millions USD)
IE00BSPLC298	SPDR EUROPE S/C VALUE	ZPRX	18/02/15	EUR	3	6	0,3	83,35
IE00BSPLC306	SPDR EUROPE VALUE	ZPRW	18/02/15	EUR	1	6	0,2	20,35

IE00B910VR50	SPDR MSCI EMU	ZPRE	25/01/13	EUR	3	8	0,18	302,31
LU0322253906	X MSCI EUROPE SMALL CAP	XXSC	10/01/08	EUR	3	13	0,3	1173,56
IE00B5MJYC95	INVECO STX 600 OPT TRAVEL	SCOR	03/07/09	EUR	3	12	0,3	16,7
LU0328475792	X STOXX EUROPE 600	XSX6	07/01/09	EUR	3	12	0,2	1560,71
LU0292100806	X STOXX600 BASICRESOURC SWAP	DXSC	13/07/07	EUR	3	13	0,3	338,54
LU0292103651	X STOXX600 BANKS SWAP	DXSF	13/07/07	EUR	3	13	0,3	40,56
LU0292105359	X EUSTOXX600 FOOD & BEV SWAP	DXSK	13/07/07	EUR	3	13	0,3	57,1
IE00B5MTWY73	INVECO STX 600 OP BASIC RES	SCOW	03/07/09	EUR	3	12	0,3	9,97
LU0274209237	X MSCI EUROPE 1C	XMEU	10/01/07	EUR	3	14	0,12	2735,44
LU0846194776	X MSCI EMU	XDSE	28/11/12	EUR	3	8	0,12	2173,92
IE00B5NLX835	INVECO STX 600 OPT AUTOS	SCOP	03/07/09	EUR	2	12	0,3	22,3
IE00B5MTWD60	INVECO STX 600 OPT BANKS	X7PS	27/07/09	EUR	3	11	0,3	72,55
IE00B5MTYL84	INVECO STX 600 OP FOOD & BEV	SC03	27/07/09	EUR	3	11	0,3	7,58
LU1598690169	LYXOR MSCI EMU VALUE DR	VAL	13/04/05	EUR	2	16	0,4	403,8
LU1215452928	UBS ETF FACTOR EMU PRIM VAL	UIMZ	22/09/15	EUR	3	5	0,28	147,4
LU0671493277	UBS ETF MSCI EMU SMALL CAP U	UEFD	04/11/11	EUR	3	9	0,33	117,66
NL0010731816	VANECK EUROPEAN EQ WT ETF	TEET	01/10/14	EUR	3	6	0,2	39,73
DE0002635307	ISHARES STOXX EUROPE 600 DE	SXPIEX	13/02/04	EUR	3	17	0,2	6115,25
DE000A0H08S0	ISHR EUR 600 TRAVEL&LEIS DE	EXV9	22/07/02	EUR	3	18	0,46	344,05
DE000A0F5UK5	ISH EUR600 BASICRESOURCE DE	EXV6	22/07/02	EUR	3	18	0,46	734,15
DE000A0Q4R28	ISHARE EUR 600 AUTO&PARTS DE	EXV5	22/07/02	EUR	2	18	0,46	516,59
DE000A0F5UJ7	ISHR STOXX EUR 600 BANKS DE	SX7PEX	04/05/01	EUR	3	20	0,46	1472,23
DE0006289309	ISHARES EURO STOXX BANKS 30-	SX7EEX	04/05/01	EUR	3	20	0,51	1859,94
DE0005933949	ISHARES STOXX EUROPE 50 DE	EXW3	03/01/01	EUR	2	20	0,51	101,5

DE000A0H08H3	ISH EUR600 FOOD&BEVERAGE DE	EXH3	22/07/02	EUR	3	18	0,46	301,2
IE00BKWQ0D84	SPDR MSCI EUROPE CON STAPLES	STS	05/12/14	EUR	3	6	0,3	123,1
IE00BKWQ0F09	SPDR EUROPE ENERGY	STN	05/12/14	EUR	3	6	0,3	106,56
IE00B5M1WJ87	SPDR EUR DIV ARISTOCRATS	SPYW	28/02/12	EUR	3	9	0,3	1512,6 5
IE00B60SWY32	INVESCO MSCI EUROPE	SMSEU R	23/03/09	EUR	2	12	0,19	96,19
IE00BKWQ0M7 5	SPDR EUROPE SMALL CAP	SMC	05/12/14	EUR	3	6	0,3	266,46
LU0959210278	LYXOR SG EUR QLY INCO NTR DR	SGQE	26/09/13	EUR	2	7	0,45	14,97
IE00B60SWW18	INVESCO STOXX EUROPE 600	SDJ600	01/04/09	EUR	3	12	0,19	327,6
DE0002635299	ISHR EUROPE SEL DIV 30 DE	EXSH	12/05/05	EUR	3	16	0,31	386,73
IE00B3Q19T94	INVESCO ESTOXX OPT BANKS	S7XE	14/04/11	EUR	3	10	0,3	232,73
LU0599613147	OSSIAM STOXX EUROPE 600 EQUA	OSX6	27/06/11	EUR	3	10	0,35	302,91
LU1598689153	LYXOR MSCI EMU SMALL CAP DR	MMS	13/04/05	EUR	3	16	0,4	261,36
LU0908500753	LYXOR CORE EURSTX 600 DR	MEUD	02/05/13	EUR	3	8	0,07	2507,9 9
FR0010261198	LYXOR MSCI EUROPE DR ETF	MEU	12/01/06	EUR	2	15	0,25	1170,3 7
DE0005933998	ISHARES STOXX EUR MID200 DE	EXSD	04/04/05	EUR	3	16	0,2	648,86
DE0005933980	ISHARES STOXXEURLARGE200 DE	EXSC	04/04/05	EUR	3	16	0,2	73,32
IE00BCLWRF22	ISHARES MSCI EMU LARGE CAP	IS3G	24/09/13	EUR	3	7	0,49	97,98
IE00BQN1K901	ISHARES EDGE MSCI ERP VALUE	IEVL	19/01/15	EUR	1	6	0,25	2578,9 3
LU0446734104	UBS ETF MSCI EUROPE	EUREU A	07/10/09	EUR	2	11	0,2	447,62
FR0011550193	BNP P STOXX EUROPE 600 ETF	ETZ	16/09/13	EUR	3	7	0,2	816,75
DE000ETFL045	DEKA STOXX EUROPE STRONG VAL	EL4D	31/03/08	EUR	2	13	0,66	49,65
DE000ETFL250	DEKA STOXX EUROPE 50 UCITS E	EL4Y	28/04/09	EUR	2	12	0,19	40,83

DE000ETFL052	DEKA STOXX EUROPE STRONG STY	EL4E	31/03/08	EUR	2	13	0,65	27,41
DE000ETFL037	DEKA STOXX EUROPE STRONG GRO	EL4C	31/03/08	EUR	2	13	0,65	316,37
DE000ETFL086	DEKA MSCI EUROPE LC UCITS ET	EL4H	29/08/08	EUR	2	12	0,31	37,1
DE000ETFL284	DEKA MSCI EUROPE UCITS ETF	EL42	16/06/09	EUR	2	12	0,3	380,47
IE00BKWQ0Q14	SPDR MSCI EUROPE	ERO	05/12/14	EUR	2	6	0,25	375,25
LU0446734369	UBS ETF MSCI EMU VALUE	EMVEU A	07/10/09	EUR	2	11	0,25	268,73
LU0147308422	UBS ETF MSCI EMU UCITS ETF	UIM4	27/09/02	EUR	3	18	0,18	3656,5 6
IE00B3LK4Z20	INVECO MSCI EUROPE VALUE	EMSV	15/03/12	EUR	2	9	0,35	47,83
DE000ETFL482	DEKA EURO ISTOXX EX FIN DVD+	ELFC	29/09/15	EUR	2	5	0,3	358,23
DE000ETFL458	DEKA MSCI EUROPE EX EMU ETF	ELF5	10/02/15	EUR	2	6	0,3	37,94
LU1291100664	BNP P MSCI EURP EXUK EX CW	EEXU	19/02/16	EUR	3	5	0,25	21,19
LU0486851024	X MSCI EUROPE VALUE	D5BL	22/03/10	EUR	1	11	0,15	18,23
FR0010821819	AMUNDI ETF MSCI EUROPE EX EM	CU9	15/12/09	EUR	2	11	0,3	205,85
FR0010655761	AMUNDI ETF MSCI UK UCITS ETF	CU1	16/09/08	EUR	2	12	0,25	35,96
IE00B3VWMM1 8	ISHARES MSCI EMU SML-C ACC	CSEMU S	22/06/09	EUR	3	12	0,58	878,28
IE00B53QG562	ISHARES CORE MSCI EMU EUR A	CSEMU	12/01/10	EUR	3	11	0,12	3585,3 4
FR0010655746	AMUNDI ETF MSCI SPAIN UCITS	CS1	16/09/08	EUR	3	12	0,25	55,89
IE00BWZN1T31	ISHARES MSCI EMU USD-H ACC	CEBP	02/07/15	EUR	3	6	0,38	161,46
FR0010717090	AMUNDI ETF MSCI EMU HIGH DIV	CD8	26/02/09	EUR	3	12	0,3	127,24
FR0010790980	AMUNDI ETF STOXX EUROPE 50 U	C5E	22/09/09	EUR	2	11	0,15	318,82
LU1834983477	LYXOR EURSTX600 BANKS	BNK	29/08/06	EUR	3	14	0,3	835,75

