JOURNAL OF DEVELOPMENT ECONOMICS AND FINANCE
Vol. 6, No. 1, 2025, pp. 207-228

URL : www.arfjournals.com
https://DOI:10.47509/JDEF.2025.v06i01.10

The Impact of Sustainable Rate on Exchange Traded Funds Performance: A Case Study of iShares from BlackRock

Boni David Jonathan Yapi[1], Mehdi Seraj[2] and Huseyin Ozdeser[3]
[1]*Near East University. Email: 20202821@std.neu.edu.tr*
[2]*Corresponding Author, Near East University, Nicosia, North Cyprus, Mersin 10, Turkey. E-mail: mehdi.seraj@neu.edu.tr*
[3]*Near East University, Chairman of Economics Department. E-mail: huseyin.ozdeser@neu.edu.tr*

Article History

Received : 22 March 2025

Revised : 30 April 2025

Accepted : 07 May 2025

Published : 30 May 2025

To cite this article

Boni David Joyathan Yapi, Mehdi Seraj & Huseyin Ozdeser (2025). The Impact of Sustainable Rate on Exchange Traded Funds Performance: A Case Study of iShares from BlackRock. *Journal of Development Economics and Finance,* Vol. 6, No. 1, pp. 207-228. https://DOI:10.47509/JDEF.2025.v06i01.10

Abstract: This study aims to assess the specific effect that sustainability rating has on the profitability of ESG Exchange Traded Funds. To achieve this, we selected the 67 sustainable ETFs issued by iShares of BlackRock and their performance during an overall timespan of five years, but segmented into three years, 2015, 2017 and 2020. For the analysis, we made use of the ARDL approach. Despite the continuous expansion of the ETF industry as a whole, there is an inattention regarding sustainable ETFs and, more precisely, their performance. Also, sustainability is not reserved for the private sector, as many suggest; it requires the input of society as a whole in order to be more impactful. Therefore, this study also tried to shed light on ESG ETFs and their characteristics and returns to both investors and society. The finding of this study provides an objective insight and are useful not only for investors but also, authorities and regulators for a more tangible level of satisfaction on both ends.

Keywords: Exchange-traded funds, iShares, sustainability, ESG

1. Introduction

Amid the modern financial sphere, two definite entities have first sprung up distinctly and then merged in recent years into Passive index funds committed to sustainability and responsible investment. An Exchange Traded Fund, commonly known as an ETF, is an investment fund which is traded as a stock. It's a fund which owns a set of various

companies' stock and securities at once (with investors' money) but with lesser tax and on time compared to if the investor had to handle the whole process by himself. ETFs have received increasing attention over the recent years. This is due in part to their attractive set of advantages. For instance, while most mutual funds require a minimum investment which can be substantial to enter, ETF investors have the ability to buy a single share of the ETF plus any commissions or fees. In addition, since most of them are passively managed and follow a fixed formula based on an existing index, their management fees are less compared to the common mutual funds actively managed by investment professionals who single-handedly select stocks for the fund. By doing so, the ETFs widen the reach of investors and provide them with access to a professional background and support. ETFs are in fact very similar to common mutual funds in the sense that they are both collective investment institution (CII), which invests collected funds from investors, but unlike ordinary mutual funds which can only be traded once a day or at the end of each trading day (Deville, 2008), ETFs can be traded whenever the stock market is open. Also, the majority of the first mutual funds are actively managed, meaning they are managed by investment professionals who carefully study and pick stocks for the fund. Hence, their fees are expensive as most of them charge between 1% and 2% annually regardless of gains or losses. Meanwhile, ETFs are passively managed (set aside 2% of them which are actively managed), meaning they follow a fixed formula or a market index. This method eliminates the need for the fund to hire professionals who constantly investigate stocks to buy and sell on behalf of the fund, which then lowers the management fees required from investors. But this doesn't go without disadvantages because index investing most of the time forces you hold on to unprofitable companies for period of time and endure with them, reason why active mutual funds tend to have higher fees compared to passive ones because they tend to take more risks, hence they hire expensive professionals to manage them which in consequence increases their expense ratios but leads to larger returns when well assessed. Even though the first EFTs were introduced in the early 1990s, their global rising popularity is portrayed by the increasing amount of assets held by ETF providers. In fact, in August 2021 the total value of ETFs, plus Exchange Traded Products (ETPs) listed globally increased from US$ 1.77 trillion in 2012 of asset to US$ 9.73 trillion of AUM in 2021 and around US$ 70 billion in net inflows from 2012 to US$ 834 billion in net inflows, nearly 1000% growth in inflows in 2021 (ETFGI, 2021).

Another important topic is the global rise of sustainable investing or Socially Responsible Investment (SRI) in the financial environment (Przychodzen et al., 2016). Sustainable investment essentially refers to investing in companies which focus on promoting good environmental, social and governance (ESG) values as well as financial returns (US SIF, 2017a). Simply put, investing sustainably refers to addressing current needs without jeopardising the coming generation's ability to meet their needs, but in contrast to preparing and leaving them with the proper tools and environment to provide for their future requirements. This originally small market has grown to be an established sector; in fact, not only the increasing number of studies on this topic but also the large number of assets allocated worldwide confirm it. For instance, we went from US$ 13.6 trillion in early 2012 to over US$ 35 trillion in sustainable assets under management globally in 2021 (Global Sustainable Investment Alliance, 2021). Legislators and investors are also playing an important role in the establishment of sustainable practices. Indeed, investors' rising consciousness (boosted by riots of society which they're part of) and law enforcers participated in increasing the number of financial institutions, asset managers and companies integrating, disclosing and being more compliant with the ESG values. In recent years, we have witnessed stock exchange markets and central banks, for example, creating completely new divisions or signing new laws which didn't exist before. For instance, the Paris agreement, which emphasises climate change, was adopted by 196 parties at the COP21 on December 12, 2015 (UNFCCC, 2020). Due to these considerable breakthroughs, both sustainable and ETF investments are now established in the financial market and are envisioned to keep on progressing. On one hand, investors' concern for a different, yet more sector-focused and cost-efficient way in passive asset management fuels the ETF's growth, and on the other hand, ESG investing is held significant by stakeholders, a growing number of regulations and investors. The main objective of this study is to assess the requirements, process and performance of sustainable investment ETFs (environmental, social and governance or ESG ETFs). While the majority of the previous research has been oriented to assess the performance of the active fund and less of passive funds, this research intends to fill the gap. Additionally, the growing awareness of the importance of sustainability, along with society increasingly holding financial institutions partially responsible as key contributors to environmental and community deterioration, prompts this study. However, as

stated above, not all investors stayed on the sidelines of this revolution; instead, they facilitated the changes occurring within financial institutions. Their need to respond to the sustainability crisis with their resources prompted many financial entities to design specific structures that align with their ESG objectives. This study will focus not only on the financial aspects but also on the tangible impact that investments through ETFs have had on society.

The second section of this paper will cover the literature review, and next will be a presentation and discussion of the data methodology used. In the fourth section, we will disclose the empirical results and examine the main findings. The last section will conclude the paper.

2. Literature Review

The publication titled Portfolio Selection in the Journal of Finance (1952), in which Harry Markowitz introduced the Modern Portfolio Theory, encourages the diversification of assets and fosters the establishment of a set of portfolios aimed at increasing dividends to alleviate—but not eliminate—peculiar risks. Most funds were active, meaning they employed professional investors who focused on finding stocks whose returns could surpass the market's index funds. However, this strategy is costly and involves greater risks. Nonetheless, this method was available to wealthy investors, considering the high transaction fees.

Hence, more investors began asking for a fund that facilitated the bulk purchase of stocks and reduced transaction costs. ETFs are commonly considered cost-effective and provide access to global industries and markets (Bodie & Al, 2017). This led to the emergence of a new breed of funds at the time—the passive fund. Passive exchange funds usually establish a set of portfolios by imitating an index's stocks or a selection of them and then sell this stock portfolio to retail investors at a lower price than it would have cost if they purchased each stock individually.

ETFs are passive index funds that quickly spread and diversify into various categories. In the field of sustainable investment, the majority of ESG ETFs focus on a technological approach. A large portion of ESG ETFs targets renewable energy, electric vehicles, and climate change initiatives (Levitt, 2017).

The rapid expansion of ETFs can be attributed to their many advantages: the possibility of being listed on stock exchanges like individual stocks, the ability to trade throughout the regular market hours (unlike active mutual funds), and the

option to sell back to the original issuer at net asset value (NAV). ETFs also gave rise to other similar systems known as Exchange-Traded Products (ETPs). These include leveraged ETFs, inverse ETFs, active ETFs, alternative ETFs, currency ETFs, Exchange-Traded Commodities (ETCs), and Exchange-Traded Notes (ETNs), among others (ETF Database, 2017b).

In 2000, there were approximately 100 ETPs worldwide, with a value of $79 billion in assets under management (AUM). By 2020, there were over 5,000 ETPs valued at more than $7 trillion in total AUM (ETFGI). ETFs are favourable and cost-effective tools for entering specific markets that would otherwise be complex and expensive to reach under different conditions (Bodie & Al, 2011; ETF Database, 2017).

ETFs have made it easier for retail, or non-professional, investors to access specific markets by allowing relatively low minimum investments, not only compared to common index mutual funds but also considering the wide range of companies they can invest in at once through a single ETF. However, not all ETFs are created equal. The BlackRock iShares team aims to make a difference. iShares focuses on empowering investors with the right tools, setting the industry benchmark for ETF trading practices, and providing a large pool of more than 800 ETFs for investors to choose from.

Although index investing is commonly described as passive, managing these index funds requires a diligent, hands-on approach depending on the fund's level of commitment. The iShares team is dedicated to building and maintaining portfolios that deliver strong performance. Their portfolio engineers go beyond the role of average portfolio managers, taking into consideration portfolio construction, investment risk management, and the design of efficient trading plans. The techniques and allocation strategies they use are crucial to establishing funds that promote specific investor objectives. All of this takes place behind the scenes to deliver a high level of accuracy in the composition of each ETF and its components.

Unlike many funds that simply copy and paste existing indexes, the iShares team goes further, reflected in their standing among the largest ETF providers, with 383 ETFs traded on the U.S. markets and a total AUM of $2.4 trillion. As of October 2021, iShares managed the largest ETF, the iShares Core S&P 500 ETF (IVV), with $317.16 billion in AUM, representing about 13% of the market (ETF, 2021). By June 2021, the U.S. sustainable ETF market had $96.1 billion in assets, with iShares

managing $58.3 billion of it (Statista, 2017). These numbers reflect not only the effectiveness of Aladdin, their investment software, and portfolio engineers, but also the trust placed by millions of investors around the world.

iShares monitors the market to develop intelligent trading strategies that help investors maintain long-term liquidity. The firm focuses on major market events that can trigger volatility and identifies factors that may impact portfolio performance. Anticipating index changes is another distinguishing feature of iShares, whose exclusive risk monitoring tools track ETFs globally, aiding in investor protection and promoting sound regulation of product structure and markets.

Index investing has had a significant impact on money management and has lowered barriers to entering investment. Although indexed AUM represents only around 10% of total public investment assets worldwide, it still presents a major opportunity for hundreds of millions of people who have yet to capitalise on it. Index investing has become more inclusive and easier to understand, eliminating the need to choose between thousands of bonds, stocks, or financial advisors. This is a major advantage for retail investors in terms of cost, knowledge, and time requirements.

Recently, ETFs have proven to be excellent tools for sustainable or socially responsible investing (SRI). They represent a driving force in finance by simultaneously addressing sustainability and long-term investment, which supports both the economy and the environment (UN PRI, 2017a). As one of the world's largest and most renowned ETF providers, iShares furthers the mission of its parent company—empowering people to achieve financial wellness. In its 2020 report on investor progress, iShares reaffirmed its commitment to making investing more straightforward, accessible, sustainable, and enduring.

By doing so, they continue to meet the high expectations of millions of investors who entrust BlackRock with their resources. Among those who weren't investing, few cited insufficient funds; rather, high barriers to entry (access, age, race, cost) were more commonly to blame. Previously, investors were often limited to domestic markets, but in the past two decades, many of those barriers have been lifted.

By enabling investment diversification and granting local investors easier access to global markets, iShares has contributed significantly to this transformation. Today, more than 100 million people use their passive investing tools and have access to a share of international markets via ETFs. The process of owning a wide portion of a given industry—or parts of many—is now as simple as buying a single stock.

iShares has also addressed one of the most overlooked issues in long-term investing: time. The firm helps people start investing earlier with minimal amounts, which has a huge impact on long-term growth and returns. Market uncertainty and risks aside, one truth remains—the earlier one starts investing, the sooner one can begin receiving consistent returns.

This shift has allowed over a million Germans to contribute monthly to ETF savings programs—including iShares ETFs—with recurring deposits as low as one or two euros. The average monthly subscription for this plan is 160 euros (Osterhoff & Kaserer, 2016). In the U.S., investors with smartphones and just $10 can acquire ETFs without trading fees, whereas 50 years ago, mutual funds typically required at least $700 to access. While some private funds still charge more, this approach was nearly unheard of in the past.

iShares isn't the only fund employing this model—many institutions now support it, resulting in a significant increase in investors, especially among younger generations. Currently, more than 22 million people own an iShares ETF, and the company remains committed to simplifying the investment process for new investors and steadily increasing the number of index and ETF investors (Nadig, 2021).

Although definitions of sustainable investing vary by industry, iShares considers sustainable finance a source of significant economic gain. Investing in line with ESG values has become a requirement for many promising opportunities. For years, it was believed that value-driven investing meant sacrificing returns by avoiding profitable companies. However, that narrative is shifting.

For instance, as of 2021, 90% of countries by global GDP had set net-zero carbon emission targets for the coming decades. India pledged to reach net-zero by 2070 at the COP26 conference—two decades after targets set by the U.S., U.K., and other high-GDP countries (UNFCCC, COP26). These commitments are reshaping industry norms and creating space for a new wave of sustainability-driven companies.

Sustainable ETFs and index investing now serve as crucial tools for investors seeking to comply with evolving regulations, promote ESG standards, and generate long-term economic returns. By offering clients a vast array of sustainable funds, iShares enables them to pursue tailored visions—whether focused on renewable energy, clean tech, social equity, or comprehensive ESG integration. They also cater to those wishing to avoid firms or sectors lagging in ESG disclosure.

While sustainable investing may limit the pool of opportunities and initially reduce returns compared to funds indifferent to ESG, this could change as global industries align with standardised ESG benchmarks (Standard & Poor's, 2017). A few years ago, iShares investors began demanding better fees, returns, and options for sustainable ETF investing. This demand has propelled the firm to further its mission: to empower investors at all levels to participate in the global shift toward sustainability.

Currently, too little research is devoted to the profitability of ESG ETFs. This may be due to their relative invisibility in the broader financial industry unless actively sought. Chen and Scholtens (2018) investigated U.S. ESG investing as a whole and introduced ESG ETFs as a secondary topic, revealing the lack of specific data disclosure. However, Alexopoulos (2018) confirmed that energy ETFs containing both ethical and sustainable companies deliver better results.

3. Data and Methodology

This section of the study describes the method used to assess the impact of sustainability on the financial performance of ETFs. It begins with a presentation of the data to be processed, followed by a description of the regression equations. The analysis method will also be presented.

3.1. Data Source and Collection

This study makes use of secondary data from BlackRock's iShares Sustainable ETF Report. We chose the ETFs from the iShares database because they are among the largest providers of ETFs in the world and are recognised as leaders in the domain of sustainability investing through ETFs. The sample consists of 67 iShares MSCI country-specific ETFs disclosing their financial performance over a five-year time span, segmented into three specific years: 2015, 2017, and 2020.

We also chose iShares because they disclose the ESG data of all the funds in which they invest, regardless of the ESG rating. Our sample encompasses companies rated from leaders (AAA) to laggards (B, CCC). ESG consideration refers to companies that account for their environmental, social, and governance factors, alongside financial factors, in their decision-making process.

The sustainable ETFs of iShares are split into three main categories: the iShares ESG Screened ETF, the iShares ESG Advanced ETF, and the iShares Thematic ESG

ETF—depending on the fund's level of tolerance toward specific commodities such as alcohol, tobacco, weapons, and oil, among others. Our dataset includes ETFs from each of these categories.

All the selected funds do not necessarily have high ESG scores, meaning they are not all leaders in terms of sustainability. This allows for a broader view of the impact of sustainability from various perspectives. The majority tend to assume that a fund operating under the label of sustainability automatically equates to having a high ESG score, but this is not always the case. In fact, many other factors intervene; some companies operating in traditional industries, while making adjustments in their processes, tend to have even higher ESG scores than those solely focused on sustainability. This helps us conduct an objective analysis of the results. Regardless of the outcome, the findings will not apply only to highly rated ESG companies.

For each ETF, the data presents the ESG score and ESG global rating relative to all funds covered by the MSCI ESG Fund Metrics. It also includes investment returns for 2015, 2017, and 2020, as well as the average return over those years.

3.2. Variable Definitions

Dependent variable

Average Investment Return (AY): The average return here represents the mean of an investor's earnings received from his investment in a tradable financial asset over the five-year time period. The average return is mostly expressed in percentage, and this percentage can be positive in case of an increased return of the amount invested or negative in case of a loss over time. In short, the percentage reveals the capital gain or loss realised from the capital's original value over those five years.

Independent variables: Investment Return: The investment return rate also known as the financial return, refers to the amount or rate of gain or loss on the fund's investment over a specific period of time typically one year. It is a crucial information for current and future stockholders to have, for it allows them to forecast accurately, and to make informed future decisions such as to exist, enter or remain in the fund.

Investment Return of 2015 (Y1) represents the amount of value investors in iShares received in 2015.

Investment Return of 2017 (Y2) represents the amount of value investors in iShares received in 2017.

Investment Return of 2020 (Y3) represents the amount of value investors in iShares received in 2020.

The ESG Score (ESGS): The ESG score is related to a firm ability to comply to specific environmental, social and governance standards. This score is calculated on peculiar traits, linked to the company's direct environment such as its industry, country, industry and size among others.

The ESG Global Rating (ESGGR): The ESGGR is designed to evaluate the strength of a company, while focusing on the long-term ESG opportunities and risks. This score is provided by the MSCI ESG RATING and it encompasses the level of compliance, adaptation and improvement of a company toward global ESG standards compared to their international peers in similar industries and under the same MSCI ESG rating.

An ESGGR rating of AAA or AA (8.6–10) is representative of a leader; an ESGGR rating of A, BBB, or BB represents average performance; and an ESGGR rating of B or CCC portrays laggards. Aside from disclosing a company's ESG score, the MSCI ESG metrics also reveal the Sustainable Global Score, which is crucial because making investment decisions based solely on ESG scores can be misleading. For instance, a company may have a good, sustainable score on its own, but when compared to other companies in the same industry, its score may need to be reduced due to several factors. These may include differences in laws and regulations between countries, the severity of sanctions for disregarding ESG standards, and the level of societal awareness, among others.

Methodology and Regression Equations

The functional form of the model used is as follows:

$AY_t = f(ESGS_t, ESGGR_t, Y1_t, Y2_t, Y3_t, \varepsilon t,)$

AY_t = Average Return

$ESGS_t$ = ESG Score

$ESGGR_t$ = ESG Global Rating

$Y1_t$ = The investment return in 2015

$Y2_t$ = The investment return in 2017

$Y3_t$ = The investment return in 2020

εt = the Error Term

Before utilising the dynamic ARDL model, the Phillips-Perron (1988) and Augmented Dickey-Fuller (Dickey & Fuller, 1979) tests were applied. The relationship between the variables was also assessed with the following equation.

$$AY\beta = \beta 0 + \beta 1ESGS_t + \beta 2ESGGR_t + \beta 3Y1_t + \beta 4Y2_t + \beta 5Y3_t + \varepsilon t$$

The coefficients of the regressors are symbolised by β1 to β5 in the equation above, and the constant is symbolised by β0.

3.3. Autoregressive Distributed Lag (ARDL) and ARDL Bounds Testing Approach

There are various cointegrating models available, largely used to process economic data. However, they have quite a list of requirements or sometimes several limitations. Given that, many researchers have shifted to the Ordinary Least Squares (OLS) followed by the Autoregressive Distributed Lag (ARDL). The ARDL model has several advantages in comparison with other cointegration methods. It is a flexible model and allows the use of variables from different integrations. It also enables the assessment of the relation between variables through its simultaneous estimation of short-run and long-run cointegration. The ARDL has been developed by Pesaran and Shin (1997) and has been used for years, but more recently, they have proved to be a very accurate means of examining the presence of long- and short-term relationships in economic time series. In our case, the ARDL test has been used to evaluate which impact does the sustainability grade of an ETF has on its main financial performance over a five-year time period. Although this model has been used for decades, they have recently been used to accurately examine and detect the presence or absence of long and short-term relationships in economic time series.

The ARDL bound test investigates the existence of cointegration among the variables through the F-test results. Once the long-run association is established, the next two steps need to be executed to estimate long-run and short-run coefficients of the proposed ARDL models. The long-run ARDL (*m*, *n*, *q*, *t*, *v*, *x*, *p*) equilibrium model is as follows:

Short run equation:

$$\Delta AY_t = \beta_0 + \sum_{i=1}^{P} \beta_{1i} \Delta AY_{t-i} \sum_{i=1}^{P} \beta_{2i} \Delta ESGS_{t-i} + \sum_{i=1}^{P} \beta_{3i} \Delta ESGGR_{t-i} + \sum_{i=1}^{P} \beta_{4i} \Delta Y1_{t-i} + \sum_{i=1}^{P} \beta_{5i} \Delta Y2_{t-i} + \sum_{i=1}^{P} \beta_{6i} \Delta Y3_{t-i} + \varepsilon t$$

Long run equation:

$$\Delta AY_t = \beta_0 + \sum_{i=1}^{P} \beta_{1i} \Delta AY_{t-i} + \sum_{i=1}^{P} \beta_{2i} \Delta ESGS_{t-i} + \sum_{i=1}^{P} \beta_{3i} \Delta ESGGR_{t-i} + \sum_{i=1}^{P} \beta_{4i} \Delta Y1_{t-i}$$
$$+ \sum_{i=1}^{P} \beta_{5i} \Delta Y2_{t-i} + \sum_{i=1}^{P} \beta_{6i} \Delta Y3_{t-i} + \theta_1 AY_{t-i} + \theta_2 ESGGR_{t-i} + \theta_3 ESGS_{t-i} + \theta_4 Y1_{t-i}$$
$$+ \theta_5 Y2_{t-i} + \theta_6 Y3_{t-i} + \varepsilon t$$

Where the regressors are represented by β1 to β6 and the long run multiplier by θ_1 to θ_6.

The null hypothesis, $\theta_1 = \theta_2 = \theta_3 = \theta_4 = \theta_5 = 0$ against the alternative, $\theta_1 \neq \theta_2 \neq \theta_3 \neq \theta_4 \neq \theta_5 \neq 0$.

4. Empirical results

Table 1: Descriptive Data Results

Variables	*AY*	*ESGS*	*ESGGR*	*Y1*	*Y2*	*Y3*
Mean	39.06	7.37	66.45	10.49	39.89	61.76
Median	33.95	7.66	75.6	8.7	32.86	53.16
Maximum	119.93	10	100	45.76	157.3	205.23
Minimum	-3.27	2.87	5.02	-9.93	-8.25	-2.86
Std. dev	27.67	1.79	28.3	11.71	32.48	44.27
Summation	2616.8	493.97	4452.27	703.4	2672.8	4138.3
observation	67	67	67	67	67	67

Table 1 shows the descriptive statistics of the ESG Score, the ESG Global Rating, the average investment return, and the returns of 2015, 2017 and 2020 of 67 sustainable Exchange Traded Funds. The total number of observations is 67. The mean value of the ESG Score for the 67 ETFs is 7.37 (A and BBB), indicating that most of these firms have a rather good ESG standard on average. The mean for their ESG Global score is 66.45%, which shows that compared to other firms in a similar industry and who also figure in the MSCI ESG, their performance is relatively low in terms of sustainability, than when they are assessed on their own. The mean for average return on investment is 39.06, which reveals that there has been a capital increase of around 39.06% from its original value. While the mean of the return of 2015, 2017, and 2020 progressively increases over time from around 10% to 61%, considering the compound interest. Also, ESGS has the lowest volatility among

all the variables based on its standard deviation. Overall, the closeness between the mean and median of each variable, which doesn't exceed 10% (Metron, 2003), reveals that the variables in this econometric model are representative of a normal distribution.

Table 2: Unit Root Test Result

ADF Test					
		Intercept		*Trend & Intercept*	
Variables	*Level of Significance*	*T-Statistic*	*P-Value*	*T-Statistic*	*P-Value*
AY	Level	-5.852500	0.0000	-5.807364	0.0000
ESGS	Level	-1.727271	0.4130	-4.009013	0.0139
	1st Difference	-11.64583	0.0000	-11.75389	0.0000
Y1	Level	-7.362805	0.0000	-8.077481	0.0000
Y2	Level	-6.957078	0.0000	-6.902813	0.0000
Y3	Level	-6.776334	0.0000	-6.726946	0.0000
ESGGR	Level	-2.648447	0.0896	-3.849986	0.0210
	1st Difference	-12.12148	0.0000	-12.20369	0.0000
PP Test					
		Intercept		*Trend & Intercept*	
Variables	*Level of Significance*	*T-Statistic*	*P-Value*	*T-Statistic*	*P-Value*
AY	Level	-5.880215	0.0000	-5.834820	0.0000
ESGS	Level	-1.954719	0.3059	-1.908753	0.6388
	1st Difference	-11.53369	0.0000	-11.76929	0.0000
Y1	Level	-7.362805	0.0000	-8.077487	0.0000
Y2	Level	-7.071534	0.0000	-7.021926	0.0000
Y3	Level	-6.855611	0.0000	-6807424	0.0000
ESGGR	Level	-1.796217	0.3793	-1.725975	0.7286
	1st Difference	-11.79450	0.0000	-12.03588	0.0000

The ARDL model requires prior knowledge of the level of integration of the variables. To ascertain the order of integration, both the Augmented Dickey-Fuller (ADF) and the Phillips-Perron (PP) tests were applied. The results of the unit root tests are presented in Table 2. The p-values of AY, Y1, Y2, and Y3 are all below 5% in the ADF test at level, with intercept and with trend and intercept. A similar result is observed with the Phillips-Perron test, with a slight difference in the t-statistic.

Regarding the ESGS and ESGGR variables, even though the ADF test shows that ESGS is significant at the level with trend and intercept, for the most part, ESGS and ESGGR are statistically significant at first difference in both tests, with intercept

and with trend and intercept. Hence, the regressors are a mixture of I (0) and I (1); some are stationary at the level, while others are stationary at first difference.

A set of variables with mixed integration orders allows for the application of the ARDL bounds testing approach initially proposed by Pesaran and Shin (1998), unlike other regression models. The findings therefore reject the null hypothesis, indicating no trend or unit root problem.

Table 3: ARDL Bound Co-integration Test

Regression function	*F-Statistic*	*Sig. Level*	*Lower bound*	*Upper bound*
AY= *f* (ESGS, ESGGR, Y1, Y2, Y3)	141.15825	10%	2.08	3
		5%	2.39	3.38
		2.5%	2.7	3.73
		1%	3.06	4.15

Before completely evaluating the ARDL model, the co-integration relationship between independent and dependent variables must first be assessed through the application of the bounds test. Table 3 above presents the results of the bounds test for the ARDL model. This part assesses the existence of cointegration between the average investment return and the ESG score, the ESG global rating, and also evaluates how each year's return evolution affected the average. The null hypothesis is that there is no cointegration, while the alternative hypothesis is that there is cointegration.

The ARDL bounds test requires a comparison of the F-statistic with the lower and upper bounds of the critical values at four levels of significance. This means that if the F-statistic is higher than the upper bound of the critical value, the variables are cointegrated. Conversely, if the F-statistic is lower than the lower bound, there is no cointegration. However, if the F-statistic lies between the lower and upper bounds, the results are inconclusive.

The findings of the study indicate the existence of cointegration among the variables. The calculated F-statistic value of 141.16 is greater than both the lower and upper bound values at the 2.5%, 5%, and 10% significance levels. This means we can strongly reject the null hypothesis and accept the alternative hypothesis: there is a cointegration relationship among the variables. Therefore, estimating our model using the ARDL approach is justified.

Table 4 ARDL Short Run

Variable	*Coefficient*	*Std. Error*	*t-Statistic*	*Prob.*
D(AY(-1))	0.041055	0.030619	1.340820	0.1864
D(AY(-2))	-0.047371	0.028838	-1.642656	0.1071
D(ESGGR)	0.286061	0.270529	1.057413	0.2957
D(ESGGR(-1))	0.224206	0.284873	0.787038	0.4352
D(ESGGR(-2))	1.328784	0.298561	4.450623	0.0001
D(ESGGR(-3))	0.197007	0.073458	2.681892	0.0101
D(ESGS)	-6.008679	4.271707	-1.406623	0.1661
D(ESGS(-1))	-3.188608	4.450594	-0.716446	0.4773
D(ESGS(-2))	-12.28835	4.580080	-2.682998	0.0100
CointEq(-1)*	-0.953579	0.028567	-33.38036	0.0000

The empirical findings in Table 4 include estimations of the short-run coefficients of the ARDL model, as automatically revealed through the use of the Akaike Information Criterion (AIC). The short-run coefficients show that ESGS has a negative coefficient and a p-value greater than 5%. This affirms the observation that a company's compliance with ESG standards does not immediately translate into financial benefits; in fact, it can often be a short-term economic disadvantage. This is due to several factors. Most companies, before adopting new sustainable practices, must cease or reduce many of their traditional activities. This transition can lead to the loss of contracts or increased internal costs, representing an economic disadvantage, especially at the beginning. However, this is not always the case for all businesses, which explains the statistical insignificance.

On the other hand, returns from previous years have a significant impact on the average yield, particularly when returns have been steadily increasing. The CointEq (-1)* term, representing the Error Correction Term (ECT), reflects the speed of adjustment from the short run to the long-run equilibrium. The ECT coefficient of -0.95 in our case is higher than -1, indicating a stable short-run relationship between the variables. Since the p-value is significant, we can also confirm a long-term relationship.

In the short run, the ESG global rating (ESGGR) has a positive and significant impact on average growth. As noted earlier, a good ESGGR offers more international advantages, and since ETFs are baskets of companies from around the world, a strong ESGGR makes a company highly attractive to ETF providers like iShares, especially considering the focus on sustainability. Here, a 1% increase in ESGGR

can lead to as much as a 130% increase in average return in the short run. This reflects the strong willingness of early adopters and investors to inject large amounts of capital into new companies for various reasons. One of these is the ongoing wave of green funds and global agreements supporting companies that operate under and toward sustainability goals. As a result, many such companies raise significantly more capital than needed during their IPOs, even when their long-term potential remains debatable.

Table 5: ARDL Long Run

Variable	*Coefficient*	*Std. Error*	*t-Statistic*	*Prob.*
AY(-1)*	-0.953579	0.051032	-18.68592	0.0000
ESGGR(-1)	0.214446	0.194252	1.103958	0.2752
ESGS(-1)	-3.808218	3.142959	-1.211666	0.2317
Y1**	0.183465	0.084538	2.170208	0.0351
Y2**	0.491930	0.121042	4.064114	0.0002
Y3**	0.203471	0.087892	2.315002	0.0250
D(AY(-1))	0.041055	0.042266	0.971362	0.3363
D(AY(-2))	-0.047371	0.035857	-1.321129	0.1929
D(ESGGR)	0.286061	0.312625	0.915029	0.3648
D(ESGGR(-1))	0.224206	0.317438	0.706300	0.4835
D(ESGGR(-2))	1.328784	0.331963	4.002803	0.0002
D(ESGGR(-3))	0.197007	0.083115	2.370287	0.0219
D(ESGS)	-6.008679	4.969967	-1.208998	0.2327
D(ESGS(-1))	-3.188608	4.984110	-0.639755	0.5254
D(ESGS(-2))	-12.28835	5.095878	-2.411429	0.0199

** and * denote that a series is stationary at the 1% and 5% level of significance, respectively.

The empirical findings in Table 5, above, reveal the estimation of the long-run coefficients of the ARDL model through the use of the Akaike Information Criterion (AIC). In the long run, the three investments' returns have a positive and significant impact on the average yield, however, the year 2017 had the highest significance during this period. This same year, a 1% increase in the return led to a 49% increase in average return in the long run. While 2015 and 2020 respectively led to an 18% and 20% increase in the average return in the long run. The year 2017 was quite special for the ETF world; during this year, they topped their growth record as a whole. We witnessed a great number of retail as much as professional investors rushing toward this investment vehicle. Data from the State Street Global Advisors (SSGA)

recorded an inflow of $464 billion in 2017, which represents an increase of 161% from 2016, which amounted to $288 billion. This massive inflow of capital received by ETFs has had a major impact on the ETF family. This aspect inevitably impacted their return to their investors. Regarding the ESG Score, it is statistically significant but negative; a 1% increase in the ESG score can lead to up to a 12% decrease in the average return in the long run. The ESG Global Rating has a positive, statistically significant impact on the average return in the long run. A 1% increase in the ESG Global Rating can lead to up to a 13% increase in the average return in the long run. It emphasises the importance of also considering the global sustainability score of funds and not solely relying on the ESG score publicly disclosed, but independently assessed. In the long run, investment in sustainable ETFs based on funds which solely disclose their ESG score may turn into losses, while investment based on the ESG Global Rating, in addition to the ESG score, tends to be more profitable.

Table 6: Residual Diagnostic Test

Test	*Statistic Value*	*Probability*
Ramsey Reset	1.087	0.3025
Normality Test (Jarque-Bera)	29.53187	0.0000
Serial Correlation Test (Breusch-Godfrey)	2.267969	0.3217
Heteroscedasticity Test (ARCH)	25.71928	0.1411

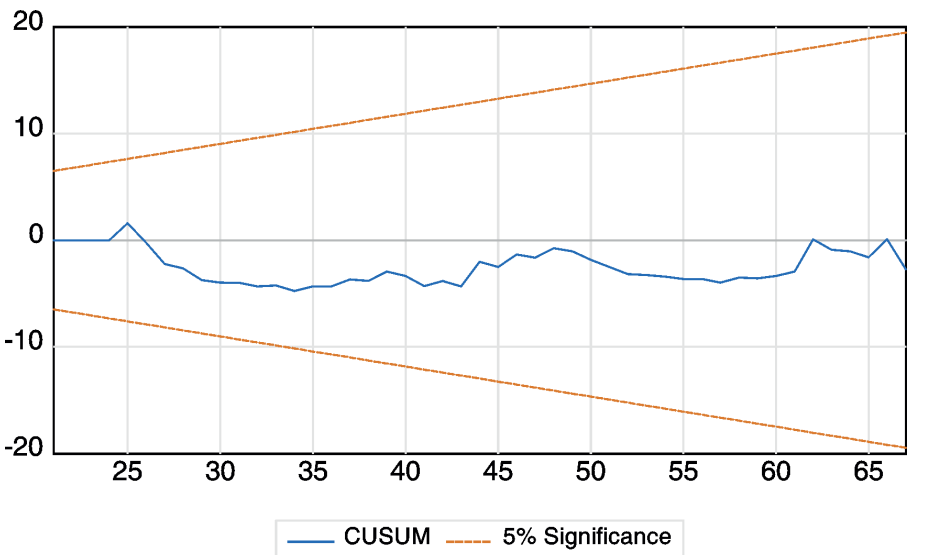

Figure 1: CUSUM Test Result

In Table 6 above, although the Jarque-Bera results reveal that the residuals are not normally distributed, the probability value of the Ramsey RESET test is greater than 0.05, indicating that the estimated model is free from specification errors. The Heteroskedasticity ARCH test discloses a p-value which is greater than 0.05, revealing that the data has homoskedasticity. The Serial correlation test, Breusch-Godfrey Test, has a P-value higher than 0.05, indicating that the dataset is free from serial correlation. We also provide the results of the CUSUM stability test of the ARDL model used in this study. Figure 1 above shows that the CUSUM graph lies within the 5% critical bounds, confirming the stability of the model.

5. Data Analysis and Discussions

ETFs are relatively new investment vehicles; their popularity is said to be new, and is still increasing when compared to other investment vehicles such as bonds and stocks. The constant inflow of capital from investors tends to boost their valuation, more than their actual performance. It is hence more complex to properly discern which of the sustainability factors of a sustainable company, belonging to an ETF, is responsible for its profitability. A closer look at ESG funds makes us wonder if those ETFs aren't just pawns on which investors bet in order to profit from each other's investment rather than the actual efficient usage of the investment received. ESG ETFs do not consist uniquely of providing investors the ability to incorporate ESG standards in their investment portfolio; it is, first of all, an investment tool from which society and the environment can benefit. Investors should ask more from the fund, not only in terms of returns, but also to trace the process of creation of those returns and ensure that the process is as sustainable than title the company's name suggests.

5.1. Conclusion

Over the past decades, exchange-traded funds have been regarded as one of the pillars of financial innovation, and since then, their expansion and popularity haven't ceased to increase. In fact, it has extended outside of the traditional purpose of solely generating profit to stockholders and investors to now addressing an issue common to society as a whole. This paper aimed to analyse the impact of the ESG factors on the performance of 67 sustainable iShares ETFs. This paper singles out one aspect, which is sustainability and how ESG ETFs perform both sustainability

and financially. Many countries are currently pledging to the net-zero agreement, and this will directly or indirectly affect most of the industries and the way they operate. Financial institutions and funds are not excluded; in fact, they are regarded as one of the fuels for most companies, regardless of the industry, considering that most businesses at a point in time required funds from those institutions, whether to start, to expand or to adapt to a coming change. Exchange-traded funds also play a huge role in the evolution of companies, they hold shares in all the industries on behalf of their investors. They may now serve as a subtle law enforcer to a certain extent regarding sustainability standards. Companies going in the sustainable direction may tend to benefit from the support of the ETF's providers, such as tax relief and the flow of capital, compared to companies working in the opposite direction. Although this specific support or provision (depending on the company's position) from the fund's issuer might not yield a huge effect on society as a whole, it is one of the various tools that every actor in society has to make to bring the global sustainability goal to success. This will bring more firms to shift toward stakeholder capitalism, which is a system in which corporations focus on meeting the needs of all their stakeholders, namely customers, employees, their community and society as a whole opposed to only shareholders' profit maximisation. However, companies considering this change seriously are going to be among the top in the future, whether sustainably or economically (in a few years, those two words will be inseparable pairs). They are going to be future leaders, because they won't be solely backed by banks or society, but highly favoured by a growing number of laws and regulations, which will make their desire to do good a new normal. Also, the current state of change, whereby countries are making net zero a legislative objective, can create good competition among companies, and make the non-disclosure of ESG practices an odd thing for a business. Companies and exchange-traded funds ignoring these coming changes are heading toward a grey horizon, considering that they are threatening their long-term return and, by doing so, their clients' investment, and their own longevity. Financial profitability is soon going to be tied to sustainability. For investors, although this study suggests that being socially responsible does not currently rhyme with a proper, distinctive financial performance, investors do not need to sacrifice financial returns for being socially responsible because, through ESG ETF investing, they are investing in a future where sustainability is a sure value.

5.2. Recommendations

Based on our analysis, we make the following policy recommendations. The delineation of ESG standard and score is a concern which has to be globally solved, but still in a way specific to every industry and the reality they individually face in their environment. Otherwise, we will witness the appearance of several highly ESG-rated firms which, in reality, negatively affect stakeholders. The increased number of sanctions for infringement on sustainable practices is a good start, but in some places, they are hardly applied, due to many factors such as corruption, misinformation. Governmental and financial authorities have to seriously investigate companies focusing on highlighting their sustainable achievements but secretly operating in a manner which says otherwise. Companies which acknowledge and deal with their ESG shortcomings are likely more trustworthy in terms of sustainability than the ones which showcase whitewashed accounts of their achievements. ESG exchange-traded funds should make more use of refinement when selecting funds in a way which avoids endorsing the wrong ones. Also, funds should deliberately include the sustainability effect and report their ESG-related actions fairly. The more the ETFs are turning toward sustainability companies, the more other companies can be triggered to do the same. In the first place, it may be just for inclusion and to enjoy the financial benefit or the goodwill it provides, but once they're in, the regular strict control they'll be under will either make them fully abide or expel them, which important sanction. Other studies should look for other relevant sustainable factors which can be used to evaluate ESG funds and performance aside from the factors on which traditional mutual funds are assessed.

References

Alexopoulos, T. A. (2018). To trust or not to trust? A comparative study of conventional and clean energy exchange-traded funds. *Energy Economics, 72*, 97–107.

BlackRock. (2020). *"People & Money" survey*. Fielded between November 2019 and January 2020.

BlackRock. (2020, November). *Broadridge, BlackRock estimate*.

BlackRock. (2020, December). *Lifepath DC plan clients*.

BlackRock. (2020, September 30). *FP & A Institutional Index AUM*.

Bodie, Z., Kane, A., & Marcus, A. J. (2011). *Investment and portfolio management* (9th ed.). McGraw-Hill Irwin.

Chen, X., & Scholtens, B. (2018). The urge to act: A comparison of active and passive socially responsible investment funds in the United States. *Corporate Social Responsibility and Environmental Management, 25*(6), 1154–1173.

Dickey, D. A., & Fuller, W. A. (1979). Distribution of the estimators for autoregressive time series with a unit root. *Journal of the American Statistical Association, 74* (366a), 427–431.

ETFGI. (2021). *Reports*. https://etfgi.com/news/press-releases/2021/09/etfgi-reports-record-assets-and-net-inflows-us973-trillion-and-us-834

ETF Database. (2017b, June). *The hidden risks and costs of ETFs*.

ETF.com. (n.d.). *Socially responsible ETFs*. https://www.etf.com/channels/socially-responsible

ETFS. (n.d.). *Exchange-traded products (ETPs)*. Investopedia. https://www.investopedia.com/terms/e/exchange-traded-products-etp.asp

Federal Reserve Bank of Dallas. (2001). *The rise of stock mutual funds* (Jan/Feb Issue).

Global Sustainable Investment Alliance. (2020). *Global sustainable review*.

Giese, G., Lee, L.-E., Melas, D., Nagy, Z., & Nishikawa, L. (2019). Foundations of ESG investing: How ESG affects equity valuation, risk, and performance. *The Journal of Portfolio Management, 45*(6), 69–83.

Hill, J. M., Nadig, D., & Hougan, M. (2015). *A comprehensive guide to exchange-traded funds (ETFs)*. CFA Institute Research Foundation.

iShares. (n.d.). *Web database*. http://www.ishares.com

Levitt, A. (2017). Five sustainable investing trends in 2017. *ETF Database*. http://etfdb.com/etf-education/5-sustainable-investing-trends-2017/

Mitikka, E. (2017). *Doing well by doing good? Performance of sustainable and socially responsible ETFs* [Master's thesis, University Name].

Morningstar. (2020). *Global asset flows report*. Retrieved from https://www.morningstar.com/

Osterhoff, F., & Kaserer, C. (2016). Determinants of tracking error in German ETFs: The role of market liquidity. *Managerial Finance, 42*(5), 490–510.

Pesaran, H. H., & Shin, Y. (1998). Generalised impulse response analysis in linear multivariate models. *Economics Letters, 58*(1), 17–29.

Pesaran, M. H., & Shin, Y. (1995). *An autoregressive distributed lag modelling approach to cointegration analysis*. Cambridge University Press.

Pesaran, M. H., Shin, Y., & Smith, R. J. (1996). *Testing for the existence of a long-run relationship* (DAE Working Paper No. 9622). University of Cambridge, Department of Applied Economics.

Pesaran, H. M., & Shin, Y. (1999). Autoregressive distributed lag modelling approach to cointegration analysis. In S. Storm (Ed.), *Econometrics and economic theory in the 20th century: The Ragnar Frisch Centennial Symposium*. Cambridge University Press.

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics, 16*(3), 289–326. https://doi.org/10.1002/jae.616

Phillips, P. C., & Perron, P. (1988). Testing for a unit root in time series regression. *Biometrika, 75*(2), 335–346.

Przychodzen, J., Gómez-Bezares, F., Przychodzen, W., & Larreina, M. (2016). ESG issues among fund managers – Factors and motives. *Sustainability, 8*(10), 1078. https://doi.org/10.3390/su8101078

SEC. (2020). *Interconnectedness and the effects of the COVID-19 economic shock*. U.S. Securities and Exchange Commission, Division of Economic and Risk Analysis.

Standard & Poor's. (2017). *Corporate responsibility environment*. https://www.spglobal.com

Statista. (2017). *Worldwide ETFs assets under management*.

UNFCCC. (2015). *The Paris Agreement*. https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement

UNFCCC. (2021, November). *Glasgow Climate Change Conference (COP26)*. https://unfccc.int/conference/glasgow-climate-change-conference-october-november-2021

US SIF. (2017a). *ESG incorporation*. https://www.ussif.org/esg

UN PRI. (2017a). *What is responsible investment?* https://www.unpri.org

World Federation of Exchanges. (2019). *Database for equity market cap*. Bank for International Settlements.

Yitzhaki, S. (2003). Gini's mean difference: A superior measure of variability for non-normal distributions. *Metron, 61*(3–4), 285–316.