



DOMESTIC VS INTERNATIONAL SOCIALLY RESPONSIBLE ETFS IN THE UNITED STATES: A PERFORMANCE EVALUATION

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Abstract: This paper examines whether socially responsible investing can be financially profitable using data from the Exchange Traded Funds (ETFs) industry in the United States over the period 2019-2023. The performance of such ETFs is assessed by discriminating between funds with domestic focus and funds that invest in companies from overseas. The results show that the domestic group beats the international one, when raw and risk-adjusted are taken into consideration. On the other hand, both groups cannot produce any material alpha against the S&P 500 Index, at least during the period under study. Our analysis also reveals that factors concerning the size, value, robustness, conservativeness and momentum of the underlying stocks are relevant to assessing the performance of responsible ETFs in the US.

Keywords: Socially Responsible Investing, ETFs, Performance, Risk-Adjusted Return

JEL Classification Codes: G11

1. INTRODUCTION

Socially Responsible Investing (SRI) has experienced tremendous growth over the recent years and trillions of dollars have been invested in such products. SRI investing, or alternatively ESG investing, targets on enterprises that apply positive environmental, social and governance values. Investors are increasingly seeking for ESG-related firms and fund providers aiming at making a positive impact on society and the environment.

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With respect to the environmental angle of responsible investing, investors evaluate the policies of companies towards climate, the use of energy, waste and pollution, the conservation of natural resources, and the treatment of animals. Issues of high importance regard direct and indirect greenhouse gas emissions, the management of toxic waste, and the compliance with environmental regulations. At the social level, the relationships of a company with several internal and external stakeholders are assessed, with areas of special interest concerning the contribution of the company to the local community, the health and safety of staff and the encouragement of employees to participate in volunteering activities. Finally, from the perspective of governance, responsible investing ensures that a firm does not engage in illegal conduct and that it uses accurate and transparent accounting methods, pursues integrity and diversity in selecting its leadership avoiding conflicts of interest when choosing board members and senior executives, and is accountable to shareholders.

One key question surrounding responsible investing is whether it comes with a cost in terms of lost performance due to the limitations that are frequently posed upon eligible investment choices and the consequent exclusion of companies that might be desirable, from a financial perspective, but not from an ESG perspective. In other words, the key question is whether investors wishing to serve a more noble cause by considering the social and environmental implications of their investing activity and limit their investment choices in this respect need to suffer a financial loss compared to investors who do not apply such criteria when forming their investment policies.

In this paper, we try to answer whether socially responsible investing can be financially profitable with data from the Exchange Traded Funds (ETFs) industry in the United States. We do so using a sample of socially responsible equity ETFs by also discriminating between ETFs that invest in local corporations and ETFs that focus on entities from international markets. We make this discrimination to answer whether responsible investors who also wish to make a profit on their investments or, at least, minimize their losses in comparison to the broad stock market should prefer local ETFs to international ETFs or vice versa.

The study period spans from 1/1/2019 to 31/12/2023 and the sample includes 25 locally oriented responsible ETFs and 26 such ETFs which invest overseas. The results indicate that the domestic sample outperforms the international one in raw and risk-adjusted return terms. However, both groups fail to deliver significant excess returns against the S&P 500 Index, which is

used as a proxy for the entire stock market in the US. Furthermore, our analysis shows that the performance of responsible ETFs can be affected by factors concerning size, value, robustness, conservativeness and momentum.

Many studies have examined stock returns by considering the impact on return by the aspects of social and environmental responsibility providing mixed results. Several studies, including those by Kumar *et al.* (2016), Nagy *et al.* (2016), Khan (2019), Lins *et al.* (2017), Yin *et al.* (2023), Albuquerque *et al.* (2020), Engelhardt *et al.* (2021), Broadstock *et al.* (2021), and Liu *et al.* (2023), have accentuated a direct relationship between corporate ESG rating and stock returns. On the other hand, there are studies, such as those by Fisher-Vanden and Thorburn (2011), El Ghouli and Karoui (2017), Sahut and Pasquini-Descomps (2015), Landi and Sciarelli (2019), and Frambo and Kok (2022), which have reached opposite conclusions. Finally, there are studies, such as those by Revelli and Viviani (2015), Halbritter and Dorfleitner (2015), La Torre *et al.* (2020), and Limkriangkrai *et al.* (2017), which report that there is no significant relationship between ESG performance and stock returns.

To the best of our knowledge, the main difference of our study to those cited above is that these studies do not allow for the origin of the invested responsible assets neglecting to make comparisons between local and international stocks. Our study is addressed to investors who wish to make responsible investments but also to ensure that they will make the most financial gain possible within this context of responsible investing. With respect to the latter, our study indicates that the domestically oriented responsible ETFs can be a better choice for US investors relative to their peers that invest in stocks from international markets.

The rest of the paper is structured as follows: Next section discusses the findings of main studies on the performance of ESG ETFs. The methodology and the sample are described in Section 3. The empirical findings are provided in Section 4. Summary and conclusions are offered in Section 5.

2. LITERATURE REVIEW

The findings of some key studies on the performance of ESG ETFs are discussed in this section. Using data from ETFs traded on the Johannesburg Stock Exchange during the period 2004-2014, Marozva (2014) finds that during periods of economic growth, the return of these ETFs do not significantly differ from the return of the JSE SRI Index. However, during periods of recession, the ESG ETFs outperform the market index. Similarly, Meziani

(2014) reports that the annual growth and risk-adjusted returns of ESG ETFs are quite significant when compared to market returns. However, the same cannot be said when performance is assessed in combination with the risk taken to achieve these returns. Meziani (2020) makes note of an improvement in the return of ESG ETFs over the recent years, contrary to their weak start during their infant days.

Furthermore, Rompotis (2016) examines the performance of the passively managed water ETFs against the tracking indexes, the S&P 500 Index, and the market portfolio built for the US by Fama and French. The results show that these ETFs cannot achieve significant alphas, no matter what market benchmark is used. On the contrary, in several cases, significantly negative alphas are estimated. Kanuri (2020) assesses the return and risk of ESG ETFs over a period spanning from February 2005 to July 2019. Occasional outperformance of ESG ETFs over the benchmarks from the US and global equity markets is revealed, even though the market indexes outperformed ESG ETFs over the entire study period.

The performance of ESG equity index funds, active mutual funds and ETFs with a US investment focus over the period 2004-2018 is the subject of a study by Plagge and Grim (2020). The empirical analysis shows that the examined ESG funds do not produce significant alphas. Milonas *et al.* (2022) evaluate the returns of 80 European and 64 American funds trying to identify whether funds investing in ESG stocks perform differently from conventional funds. The findings do not reveal any statistically significant difference in returns between ESG and non-ESG funds.

The performance of 49 ESG ETFs traded in the UK is examined by Rompotis (2022a). The results show that no significant alpha is achieved by these ETFs, while there are no differences in Sharpe and Treynor ratios between ETFs and the market benchmarks. Rompotis (2022b) examines the relation between ETFs' ESG score and performance assuming that an ETF with a high ESG rating should present high returns too. The empirical results do not verify this expectation. Fiordelisi *et al.* (2023) compare the performance and liquidity of a global sample of socially responsible ETFs to the performance and liquidity on non-socially responsible ETFs finding that the socially responsible ETFs perform better than their non-responsible peers, also being more liquid than them.

Finally, several studies have examined how ESG ETFs behaved over the recent health crisis relating to COVID-19. In this respect, Folger-Laronde *et*

al. (2022) analyze the relationship between the financial return of ETFs in Canada and their Eco-fund ratings during the market crash resulted from the COVID-19 pandemic showing that higher levels of sustainability efficiency cannot protect ETFs from financial losses during severe market downturns. Pavlova and de Boyrie (2022) draw similar inferences. On the contrary, by investigating the returns, abnormal returns, and the Sharpe ratio of ESG ETFs against conventional investments during the COVID-19 pandemic, Omura *et al.* (2021) show that responsible investing prevailed during the health crisis. The outperformance of ESG ETFs against the market over the COVID-19 market stress is verified by Nguyen (2023) and ElBannan (2023).

3. RESEARCH METHODOLOGY

3.1. Data and Statistics

Our sample includes 25 locally oriented responsible ETFs and 26 that invest in entities from international markets. The study period spans from 1/1/2019 to 31/12/2023. The profiles of the examined ETFs are provided in Tables 1.1 (domestic sample) and 1.2 (international sample). The profile of each ETF includes its symbol and name, inception date, expense ratio, assets as at 31/12/2023, average volume over the entire study period, trade frequency, i.e., the portion of days with non-zero trading volume over the study period, average intraday volatility, computed as the fraction of the daily highest trade price minus the daily lowest price to the daily close price, ESG score found on etfdb.com, and Morningstar's Corporate Sustainability and Carbon Risk Scores. The higher the latter scores, the higher the risk of an ETF from an ESG perspective.

The average expense ratios are equal to 0.35% and 0.39% for the domestic and international ETFs, respectively. The difference between the average expense ratios of the two groups is not a surprise as ETFs with international focus tend to be more expensive than their domestic peers. Furthermore, the average domestic ETF held about 1.6 billion dollars at the end of the study period. The corresponding average of international ETFs equaled 1 billion dollars. In regard to tradability, on average, the domestic ETFs present weaker trade volumes than the international ETFs, whereas the former trade slightly more frequently than the latter, as evidenced by a difference of 1.3% between the average trade frequencies of the two groups. In addition, the domestic ETFs are more volatile intraday than their international peers.

Table 1.1: The Domestic Sample

This table presents the profiles of the locally oriented ETFs, which include their symbol, name, managing company, type, inception date, expense ratio, assets as at 31/12/2023, average volume, trade frequency and average intraday volatility over the period 2019–2023, the ESG score found on etfdb.com and Morningstar's Corporate Sustainability Score and Carbon Risk Score.

<i>Symbol</i>	<i>Name</i>	<i>Inception</i>	<i>Exp. Ratio</i>	<i>Assets (\$B's)</i>	<i>Volume</i>	<i>Trade Freq.</i>	<i>Intr. Vol.</i>	<i>ESG Score</i>	<i>Corporate Sustainability Score</i>	<i>Carbon Risk Score</i>
ESGU	iShares ESG Aware MSCI USA ETF	Dec 01, 2016	0.15%	12.60	913,441	100.00%	1.264	7.40	20.48	6.24
ESGV	Vanguard ESG U.S. Stock ETF	Sep 18, 2018	0.09%	8.36	238,868	100.00%	1.313	6.56	20.24	4.64
DSI	iShares MSCI KLD 400 Social ETF	Nov 14, 2006	0.25%	4.42	177,656	100.00%	1.258	7.42	18.72	4.82
SUSA	iShares MSCI USA ESG Select ETF	Jan 24, 2005	0.25%	3.48	180,452	100.00%	1.247	8.28	18.43	5.14
SPYX	SPDR S&P 500 Fossil Fuel Reserves Free ETF	Nov 30, 2015	0.20%	1.72	118,080	100.00%	1.235	6.61	20.92	6.04
NULV	Nuveen ESG Large-Cap Value ETF	Dec 13, 2016	0.26%	1.60	138,651	100.00%	1.122	7.71	20.35	6.79
ESML	iShares ESG Aware MSCI USA Small-Cap ETF	Apr 10, 2018	0.17%	1.59	120,626	100.00%	1.621	6.75	22.69	11.41
NULG	Nuveen ESG Large-Cap Growth ETF	Dec 13, 2016	0.26%	1.35	64,734	100.00%	1.428	7.44	18.81	3.75
NUSC	Nuveen ESG Small-Cap ETF	Dec 13, 2016	0.31%	1.16	89,665	100.00%	1.601	7.02	21.51	9.80
QCIN	First Trust NASDAQ Clean Edge Green Energy Index Fund	Feb 08, 2007	0.58%	0.75	258,187	100.00%	2.818	6.69	22.26	10.01
KRMA	Global X Conscious Companies ETF	Jul 11, 2016	0.43%	0.63	28,293	100.00%	1.238	7.14	19.42	5.47
NUMG	Nuveen ESG Mid-Cap Growth ETF	Dec 13, 2016	0.31%	0.40	36,277	100.00%	1.481	7.63	19.85	6.24
NUMV	Nuveen ESG Mid-Cap Value ETF	Dec 13, 2016	0.31%	0.34	35,027	100.00%	1.247	7.76	19.52	9.52
JUST	Goldman Sachs JUST U.S. Large Cap Equity ETF	Jun 07, 2018	0.20%	0.34	13,192	100.00%	1.022	6.87	20.74	6.39
SHE	SPDR MSCI USA Gender Diversity ETF	Mar 07, 2016	0.20%	0.24	11,802	100.00%	1.081	6.79	21.48	6.36
LRGE	ClearBridge Large Cap Growth ESG ETF	May 22, 2017	0.47%	0.22	24,678	99.52%	1.257	6.91	19.62	3.68
ACES	ALPS Clean Energy ETF	Jun 29, 2018	0.55%	0.21	80,739	100.00%	2.594	7.20	21.83	10.27
CNRG	SPDR S&P Kensho Clean Power ETF	Oct 22, 2018	0.45%	0.20	22,364	99.84%	2.298	6.85	25.23	11.41

Symbol	Name	Inception	Exp. Ratio	Assets (\$Bt)	Volume	Trade Freq.	Intr. Vol.	ESG Score	Corporate Sustainability Score	Carbon Risk Score
ESG	FlexShares STOXX U.S. ESG Select Index Fund	Jul 13, 2016	0.32%	0.20	6,261	99.76%	0.865	6.48	22.21	7.25
ETHO	Amplify Etho Climate Leadership U.S. ETF	Nov 18, 2015	0.45%	0.19	8,034	100.00%	1.284	6.65	19.28	6.50
CHGX	AXS Change Finance ESG ETF	Oct 09, 2017	0.49%	0.13	11,999	100.00%	1.131	6.88	18.67	3.91
CACG	ClearBridge All Cap Growth ESG ETF	May 03, 2017	0.54%	0.12	15,269	100.00%	1.227	6.59	19.76	3.26
ESGS	Columbia U.S. ESG Equity Income ETF	Jun 13, 2016	0.35%	0.06	2,881	95.71%	0.597	7.06	23.01	11.52
WOMN	Impact Shares YWCA Women's Empowerment ETF	Aug 24, 2018	0.75%	0.05	2,649	98.81%	0.711	6.73	22.06	6.58
NACP	Impact Shares NAACP Minority Empowerment ETF	Jul 18, 2018	0.49%	0.04	3,236	97.62%	0.849	6.68	21.62	6.53
Average			0.35%	1.62	104,122	99.65%	1.352	7.04	20.75	6.94
Min			0.09%	0.04	2,649	95.71%	0.597	6.48	18.43	3.26
Max			0.75%	12.60	913,441	100.00%	2.818	8.28	25.23	11.52

Table 1.2: The International Sample

This table presents the profiles of the internationally oriented ETFs, which include their symbol, name, managing company, type, inception date, expense ratio, assets as at 31/12/2023, average volume, trade frequency and average intraday volatility over the period 2019–2023, the ESG score found on etfdb.com and Morningstar's Corporate Sustainability Score and Carbon Risk Score.

Symbol	Name	Inception	Exp. Ratio	Assets (\$B)	Volume	Trade Freq.	Intr. Vol.	ESG Score	Corporate Sustainability Score	Carbon Risk Score
ESGD	iShares ESG Aware MSCI EAFE ETF	Jun 28, 2016	0.20%	8.10	390,557	100.00%	0.940	8.55	19.92	7.93
ESGE	iShares ESG Aware MSCI EM ETF	Jun 28, 2016	0.25%	4.12	1,297,748	100.00%	1.071	7.45	22.31	10.35
VSGX	Vanguard ESG International Stock ETF	Sep 18, 2018	0.12%	3.76	167,101	100.00%	0.921	7.10	20.73	7.53
ICLN	iShares Global Clean Energy ETF	Jun 24, 2008	0.41%	2.37	3,624,964	100.00%	2.049	7.03	23.37	7.35
XSOE	WisdomTree Emerging Markets ex-State-Owned Enterprises Fund	Dec 10, 2014	0.32%	1.99	565,836	100.00%	1.088	5.86	23.35	10.53
TAN	Invesco Solar ETF	Apr 15, 2008	0.67%	1.23	1,008,917	100.00%	3.048	6.70	21.79	7.29
CRBN	iShares MSCI ACWI Low Carbon Target ETF	Dec 09, 2014	0.20%	0.93	19,898	100.00%	0.937	6.75	20.64	6.10
EMCR	Xtrackers Emerging Markets Carbon Reduction and Climate Improvers ETF	Dec 06, 2018	0.15%	0.56	38,569	89.67%	0.359	6.04	22.02	8.25
NUDM	Nuveen ESG International Developed Markets Equity ETF	Jun 07, 2017	0.31%	0.41	45,631	100.00%	0.973	8.75	19.56	6.44
CXSE	WisdomTree China ex-State-Owned Enterprises Fund	Sep 19, 2012	0.32%	0.36	124,625	100.00%	1.336	4.87	25.26	8.44
PBW	Invesco WilderHill Clean Energy ETF	Mar 03, 2005	0.66%	0.34	336,045	100.00%	3.226	5.93	25.88	13.40
SDG	iShares MSCI Global Sustainable Development Goals ETF	Apr 20, 2016	0.49%	0.31	18,737	100.00%	0.950	7.37	21.68	8.06
EFAX	SPDR MSCI EAFE Fossil Fuel Reserves Free ETF	Oct 24, 2016	0.20%	0.26	16,907	99.84%	0.714	7.70	19.96	6.79
NUEM	Nuveen ESG Emerging Markets Equity ETF	Jun 07, 2017	0.36%	0.24	38,157	100.00%	1.084	6.95	22.80	10.01
ERTH	Invesco MSCI Sustainable Future ETF	Oct 24, 2006	0.62%	0.19	23,006	100.00%	1.587	7.14	19.42	8.47
FAN	First Trust Global Wind Energy ETF	Jun 16, 2008	0.60%	0.19	102,343	100.00%	1.157	7.64	23.12	8.65
PBD	Invesco Global Clean Energy ETF	Jun 13, 2007	0.75%	0.12	59,841	100.00%	1.823	6.69	21.80	9.51

Symbol	Name	Inception	Exp. Ratio	Assets (\$B)	Volume	Trade Freq.	Intr. Vol.	ESG Score	Corporate Sustainability Score	Carbon Risk Score
NZAC	SPDR MSCI ACWI Climate Paris Aligned ETF	Nov 25, 2014	0.12%	0.11	18,281	100.00%	0.718	6.94	19.82	5.12
EEMX	SPDR MSCI Emerging Markets Fossil Fuel Reserves Free ETF	Oct 24, 2016	0.30%	0.08	14,473	99.60%	0.737	5.95	22.70	9.39
EVX	VanEck Environmental Services ETF	Oct 10, 2006	0.55%	0.08	2,086	100.00%	0.992	6.37	22.25	11.01
KGRN	KraneShares MSCI China Clean Technology Index ETF	Oct 13, 2017	0.79%	0.06	36,262	92.85%	1.689	5.94	25.96	12.30
EBLU	Ecofin Global Water ESG Fund	Feb 15, 2017	0.40%	0.05	6,420	99.92%	1.108	7.95	20.10	10.65
EASG	Xtrackers MSCI EAFE ESG Leaders Equity ETF	Sep 06, 2018	0.14%	0.05	4,975	93.64%	0.576	8.47	18.99	6.52
RNRG	Global X Renewable Energy Producers ETF	May 28, 2015	0.65%	0.04	40,881	100.00%	1.368	7.56	21.62	3.73
EMSG	Xtrackers MSCI Emerging Markets ESG Leaders Equity ETF	Dec 06, 2018	0.20%	0.03	3,604	92.61%	0.508	6.86	22.27	10.55
ESGN	Columbia International ESG Equity Income ETF	Jun 13, 2016	0.45%	0.01	817	88.95%	0.302	7.86	23.07	12.92
Average			0.39%	1.00	307,949	98.35%	1.202	7.02	21.94	8.74
Mfn			0.12%	0.01	817	88.95%	0.302	4.87	18.99	3.73
Max			0.79%	8.10	3,624,964	100.00%	3.226	8.75	25.96	13.40

When it comes to sustainability, there are slight differences in the ESG metrics between the two groups. The average ESG score of domestic ETFs is 7.04, while the respective score of international ETFs is 7.02. The average Corporate Sustainability scores of the two groups are equal to 20.75 (for the domestic group) and 21.94 (for the international group), indicating that the locally focused ETFs are more efficient than the international ETFs from an ESG perspective. Carbon Risk scores verify this inference.

With respect to ESG efficiency, a comment that should be made is that the relevant metrics are not that spectacular for both groups. To our view, the ESG score of a responsible ETF should be quite close to the optimal score of 10. This is not the case for the examined responsible ETFs, no matter if they invest in local or international stocks. On the other hand, in Morningstar's terminology, a responsible ETF should present negligent or, at least, low ESG risk. On average, the examined ETFs are of medium ESG risk. The evidence on the relatively mediocre ESG performance of the examined socially and environmentally responsible ETFs should not be overlooked by investors who wish to make an impact through their investments in relevant ETFs.

Table 2 presents the descriptive statistics of ETFs' returns over the period under study. The average daily return of domestic ETFs equals 6 basis points (bps). The corresponding return of international ETFs equals 3.7 bps, indicating that the domestic group outperforms the international one. Outperformance is more evidenced when the total (cumulative) return of ETFs is considered. In particular, the average domestic ETF achieved a total return of 84.6%, whereas the corresponding return of the international group is much lower at 39.2%. In regard to total risk, the domestic ETFs are slightly less risky than their international counterparts (1.537 vs 1.559 standard deviation of returns for domestic and international ETFs, respectively).

Overall, the analysis of raw returns indicates that, from a financial perspective, a socially and environmentally sensitive investor should prefer the relevant domestically invested ETFs to the international ones, at least given the raw return data over the examined period. In fact, that investor could do so by exposing themselves to relatively lower risk than the risk associated with investing in ETFs with international focus.

3.2. Research Methods

We compute four alternative types of risk-adjusted returns. The first one is the Sharpe ratio shown in formula (1):

$$SR_i = \frac{R_i - R_f}{\sigma_i} \quad (1)$$

where R_i is the average return of the *ith* ETF and R_f is the risk-free rate. σ_i is the standard deviation of ETFs' excess return, i.e., ETF return minus the risk-free rate. The Sharpe ratio is estimated by the division of excess return by risk and is used to determine how well an ETF compensates its investors for the per unit risk they take. The higher the Sharpe ratio, the better the performance of an ETF.

The second risk-adjusted return measure used is the Treynor ratio:

$$TR_i = \frac{R_i - R_f}{\beta_i} \quad (2)$$

where R_i and R_f are defined as above. β_i is the systematic risk of ETFs deriving from the performance regression model (5) below. The Treynor ratio is computed by dividing ETFs' excess return by systematic risk and is used to determine how well an ETF compensates its investors for the per unit systematic risk they take. The higher the Treynor ratio, the better the performance of an ETF.

The next risk-adjusted return measure employed is the Modigliani-Modigliani (MM) ratio, which measures the risk-adjusted return of a portfolio by multiplying the Sharpe ratio with the standard deviation of the market index (i.e., the S&P 500 Index) and adding the risk-free return thereafter to it. The MM ratio is shown in formula (3):

$$MM_i = SR_i * \sigma_m + R_f \quad (3)$$

where SR_i is the Sharpe ratio of the *ith* ETF and σ_m is the standard deviation (risk) in market return. R_f is defined as above. Similar to the Sharpe ratio, the higher the MM ratio, the better the performance of an ETF.

The last risk-adjusted return measure used is the Information Ratio:

$$IR_i = \frac{R_i - R_m}{TE_i} \quad (4)$$

where R_i and R_m are defined as above and TE is the tracking error of the *ith* ETF, that is the standard deviation of the differences between ETFs and market return. The IR identifies how much the return of an ETF exceeds the return of the market and, thus, the higher the information ratio of an ETF, the better.

After the calculation of risk-adjusted returns, we assess the performance of ETFs with a six-factor model which uses the Fama and French (2015) model

Table 2: Descriptive Statistics of Returns

This table presents the descriptive statistics of ETFs' returns over the period 2019-2023. Descriptive statistics include average and median daily return, standard deviation of returns, extreme scores, i.e., minimum and maximum returns, and total (cumulative) returns over the entire study period.

Panel A: The Domestic Sample										Panel B: The International Sample									
Symbol	Average	Median	Stdev	Min	Max	Total	Symbol	Average	Median	Stdev	Min	Max	Total						
ESGU	0.061	0.084	1.360	-12.003	9.694	91.007	ESGD	0.030	0.059	1.252	-11.037	8.795	31.649						
ESGV	0.064	0.093	1.388	-11.030	9.416	97.814	ESGE	0.013	0.062	1.397	-12.483	7.897	4.532						
DSI	0.063	0.069	1.381	-12.052	10.019	95.806	VSGX	0.025	0.072	1.207	-11.219	7.726	24.225						
SUSA	0.062	0.086	1.351	-10.340	10.499	94.900	ICLN	0.071	0.000	2.025	-12.811	11.405	88.499						
SPYX	0.060	0.101	1.335	-11.437	9.151	91.057	XSOE	0.020	0.063	1.428	-11.864	8.452	12.989						
NULV	0.033	0.089	1.282	-11.518	8.762	37.315	TAN	0.122	0.040	2.748	-16.084	13.501	187.601						
ESML	0.054	0.078	1.624	-13.914	9.382	67.726	CRBN	0.046	0.091	1.249	-11.020	8.067	60.624						
NULG	0.078	0.136	1.528	-10.352	10.537	130.874	EMCR	0.021	0.000	1.265	-10.396	8.581	16.984						
NUSC	0.050	0.079	1.653	-15.331	8.930	58.051	NUDM	0.030	0.085	1.257	-11.222	7.234	31.450						
QCLN	0.102	0.172	2.555	-12.982	14.603	139.330	CXSE	0.013	0.027	1.992	-9.900	21.691	-7.965						
KRMA	0.057	0.098	1.393	-10.676	11.011	82.215	PBW	0.066	0.142	2.825	-14.476	14.457	38.943						
NUMG	0.051	0.141	1.592	-13.519	10.248	61.432	SDG	0.040	0.051	1.139	-9.868	5.731	52.925						
NUMV	0.034	0.078	1.538	-13.801	10.405	32.300	EFAX	0.028	0.063	1.229	-10.874	7.084	29.151						
JUST	0.059	0.084	1.311	-10.745	9.533	89.171	NUEM	0.018	0.054	1.328	-9.910	7.681	12.898						
SHE	0.041	0.069	1.364	-11.084	10.391	49.062	ERTH	0.035	0.068	1.718	-12.232	7.973	28.362						
LRGE	0.069	0.123	1.456	-9.128	8.241	108.378	FAN	0.040	0.004	1.520	-11.606	10.362	43.805						
ACES	0.065	0.103	2.381	-13.392	12.551	58.114	PBD	0.055	0.100	2.023	-18.306	10.973	53.263						
CNRG	0.099	0.094	2.298	-13.191	12.331	150.009	NZAC	0.046	0.099	1.262	-10.201	9.175	60.344						
ESG	0.062	0.095	1.332	-10.252	8.330	95.383	EEMX	0.016	0.048	1.365	-12.625	8.369	8.495						
ETHO	0.054	0.068	1.451	-9.835	10.551	73.685	EVX	0.059	0.093	1.480	-10.908	7.751	83.042						

<i>Panel A: The Domestic Sample</i>							<i>Panel B: The International Sample</i>						
<i>Symbol</i>	<i>Average</i>	<i>Median</i>	<i>Stdev</i>	<i>Min</i>	<i>Max</i>	<i>Total</i>	<i>Symbol</i>	<i>Average</i>	<i>Median</i>	<i>Stdev</i>	<i>Min</i>	<i>Max</i>	<i>Total</i>
CHGX	0.060	0.089	1.363	-9.801	10.876	88.243	KGRN	0.046	0.000	2.221	-9.676	18.270	31.275
CACG	0.056	0.104	1.495	-12.075	9.008	76.281	EBLU	0.052	0.094	1.364	-10.252	9.021	70.672
ESGS	0.051	0.010	1.419	-10.249	12.103	68.264	EASG	0.030	0.015	1.223	-10.502	7.917	32.465
WOMN	0.060	0.083	1.323	-9.185	7.881	89.250	RNRG	0.011	0.000	1.427	-9.856	9.223	0.444
NACP	0.058	0.066	1.258	-9.252	6.848	88.211	EMSG	0.010	0.000	1.396	-10.033	8.908	0.528
							ESGN	0.023	0.000	1.187	-10.868	7.891	21.770
<i>Average</i>	0.060	0.092	1.537	-11.486	10.052	84.555	<i>Average</i>	0.037	0.051	1.559	-11.547	9.774	39.191
<i>Min</i>	0.033	0.010	1.258	-15.331	6.848	32.300	<i>Min</i>	0.010	0.000	1.139	-18.306	5.731	-7.965
<i>Max</i>	0.102	0.172	2.555	-9.128	14.603	150.009	<i>Max</i>	0.122	0.142	2.825	-9.676	21.691	187.601

combined with the momentum factor of Carhart (1997). The applied model is as follows:

$$R_i - R_f = \alpha_i + \beta_{1,i}(R_m - R_f) + \beta_{2,i}SMB + \beta_{3,i}HML + \beta_{4,i}RMW + \beta_{5,i}CMA + \beta_{6,i}MOM + \varepsilon_i \quad (5)$$

where R_i is the return of the *ith* ETF, R_m is the market return represented by the S&P 500 Index, and R_f is the risk free rate. SMB (Small Minus Big) is the average return on nine small-cap portfolios minus the average return on nine large-cap portfolios. HML (High Minus Low) is the average return on two value portfolios (in book-to-market equity terms) minus the average return on two growth portfolios. The RMW (Robust Minus Weak) and the CMA (Conservative Minus Aggressive) factors correspond to the Fama and French (2015) operating profitability and investment factors, respectively. MOM is the momentum factor.¹

4. EMPIRICAL RESULTS

The calculations of risk-adjusted returns are presented in Table 3 for both groups. The average Sharpe ratio of domestic ETFs is equal to 0.035. The respective average ratio of international ETFs is equal to 0.018. These figures indicate that the domestic ETFs beat the international ones. Similar average outperformance is found when the rest risk-adjusted return measures are assessed with no exception.

Overall, these risk-adjusted return measures are in line with the raw returns discussed above and confirm our inference about the superiority of domestic responsible ETFs against their international peers. Consequently, our recommendation about US investors preferring responsible ETFs that are locally focused instead of ETFs with international focus for financial purposes is supported by the risk-adjusted returns measures too.

The results of model (5) on the performance of ETFs are provided in Tables 4.1 and 4.2 for domestic and international ETFs, respectively. As shown in both tables, no significantly positive alphas are achieved by the examined ETFs against the S&P 500 Index, with just one exception of a domestic ETF, which presents a significant alpha of 0.02. Two domestic ETFs achieve significantly negative alphas, while no significant alphas are obtained for the international ETFs. Overall, the regression analysis reveals that the selected domestic and international ETFs cannot be used in strategies that aim at beating the broad stock market index.

Table 3: Risk-Adjusted Returns

This table presents four types of ETFs' risk-adjusted return, i.e., the Sharpe Ratio, the Treynor Ratio, the Modigliani-Modigliani (MM) Ratio, and the Information Ratio over the period 2019-2023 31/1/2024.

<i>Symbol</i>	<i>Panel A: The Domestic Sample</i>				<i>Panel B: The International Sample</i>				
	<i>Sharpe</i>	<i>Treynor</i>	<i>MM</i>	<i>InfoRatio</i>	<i>Symbol</i>	<i>Sharpe</i>	<i>Treynor</i>	<i>MM</i>	<i>InfoRatio</i>
ESGU	0.040	0.054	0.060	0.004	ESGD	0.018	0.029	0.031	-0.046
ESGV	0.041	0.057	0.062	0.021	ESGE	0.005	0.008	0.013	-0.050
DSI	0.041	0.056	0.061	0.017	VSGX	0.015	0.023	0.027	-0.056
SUSA	0.041	0.056	0.062	0.011	ICLN	0.032	0.066	0.049	0.007
SPYX	0.040	0.054	0.061	0.002	XSOE	0.009	0.017	0.019	-0.042
NULV	0.021	0.029	0.035	-0.054	TAN	0.042	0.103	0.063	0.028
ESML	0.029	0.047	0.046	-0.008	CRBN	0.031	0.043	0.048	-0.047
NULG	0.047	0.069	0.070	0.034	EMCR	0.011	0.020	0.021	-0.042
NUSC	0.026	0.043	0.042	-0.013	NUDM	0.018	0.029	0.031	-0.043
QCLN	0.037	0.078	0.057	0.023	CXSE	0.003	0.009	0.011	-0.027
KRMA	0.036	0.052	0.056	-0.006	PBW	0.021	0.048	0.035	0.003
NUMG	0.028	0.045	0.044	-0.012	SDG	0.029	0.047	0.046	-0.028
NUMV	0.018	0.027	0.031	-0.038	EFAX	0.017	0.027	0.030	-0.048
JUST	0.040	0.054	0.061	-0.006	NUEM	0.009	0.017	0.019	-0.042
SHE	0.025	0.036	0.041	-0.058	ERTH	0.016	0.031	0.029	-0.024
LRGE	0.043	0.064	0.064	0.016	FAN	0.022	0.041	0.037	-0.019
ACES	0.024	0.053	0.040	0.003	PBD	0.024	0.046	0.039	-0.004
CNRG	0.040	0.087	0.061	0.023	NZAC	0.031	0.044	0.048	-0.038

<i>Panel A: The Domestic Sample</i>						<i>Panel B: The International Sample</i>					
<i>Symbol</i>	<i>Sharpe</i>	<i>Treynor</i>	<i>MM</i>	<i>InfoRatio</i>	<i>Symbol</i>	<i>Sharpe</i>	<i>Treynor</i>	<i>MM</i>	<i>InfoRatio</i>		
ESG	0.041	0.057	0.063	0.010	EEMX	0.007	0.012	0.016	-0.047		
ETHO	0.033	0.050	0.051	-0.011	EVX	0.035	0.061	0.054	-0.001		
CHGX	0.039	0.057	0.059	-0.001	KGRN	0.018	0.059	0.031	-0.007		
CACG	0.033	0.050	0.051	-0.007	EBLU	0.033	0.053	0.051	-0.011		
ESGS	0.031	0.053	0.049	-0.010	EASG	0.019	0.031	0.032	-0.039		
WOMN	0.040	0.058	0.060	-0.001	RNRG	0.003	0.005	0.010	-0.047		
NACP	0.041	0.058	0.062	-0.005	EMSG	0.002	0.005	0.010	-0.048		
					ESGN	0.013	0.024	0.025	-0.042		
Average	0.035	0.054	0.054	-0.003	Average	0.018	0.035	0.032	-0.029		
Min	0.018	0.027	0.031	-0.058	Min	0.002	0.005	0.010	-0.056		
Max	0.047	0.087	0.070	0.034	Max	0.042	0.103	0.063	0.028		

Going further, the systematic risk (as expressed by the betas against the S&P 500 Index) of domestic ETFs exceeds that of international ETFs (i.e., 0.983 vs 0.816) also showing that, expectedly, the domestic ETFs are more aligned with the local broad market index than the international ETFs are.

With respect to the rest explanatory variables, the results of model (5) show that the performance of responsible ETFs can be affected by factors concerning size, value, robustness, conservativeness and momentum. In particular, the average SMB estimate is equal to 0.271 and 0.297 for the domestic and international ETFs, respectively. In addition, with some minor exceptions, all the single SMB estimates are significantly positive. With respect to the value factor, the average HML coefficient of domestic ETFs is negative at -0.025, with the majority of individual estimates being significantly negative (15 estimates). The opposite is the case for international ETFs, where the average HML estimate is positive and 12 single estimates are significantly positive.

The robustness factor affects both groups in a negative way, as the average, but also the majority of the single RMW coefficients, are negative and significant. The impact on performance by the conservativeness factor is negative too. Finally, the momentum factor is, on average, negatively related to the performance of domestic ETFs (12 single MOM estimates are significantly negative and 7 are significantly positive), while this factor is relevant to the performance of only 7 international ETFs (4 positive and 3 negative MOM estimates are found in Table 4.2).

A last comment that should be made concerns the overall explanatory power of the applied regression model. As reflected in the R-squared values, the six-factor model used is quite sufficient to assess the performance of the examined responsible ETFs. The average R^2 of domestic ETFs is equal to 0.91, while the respective average R^2 of international ETFs is lower at 0.65.

5. CONCLUSION

In this study, we focus on the performance of the US-listed responsible ETFs by discriminating between funds with domestic focus and funds which track indexes from international stock markets. The five year period 2019-2023 is covered and a sample of 51 ETFs (25 domestic and 26 international) is employed. Methodologically speaking, raw and risk-adjusted returns are assessed. Regression analysis of performance is conducted too.

The results indicate that the raw returns of both groups have been positive over the study period. However, the domestic group clearly outperforms the

Table 4.1: Multi-Factor Performance Regression Results (The Domestic Sample)

This table presents the results of a multi-factor performance regression model via which the daily excess return, i.e., return minus the risk-free rate, of each domestically oriented ETF is regressed on the corresponding return of the S&P 500 Index, the Fama & French's (2015) SMB (small minus big) factor, the HML (high minus low book-to-price ratio) factor, the RMW (robust minus weak) factor, the CMA (conservative minus aggressive) factor, and the Carhart's (1997) MOM (momentum) factor, over the period 2019–2023.

Symbol	α	T -stat	β	T -stat	SMB	T -stat	HML	T -stat	RMW	T -stat	CMA	T -stat	MOM	T -stat	R^2
ESGU	0.001	0.412	1.004 ^a	389.162	0.007	1.381	-0.011 ^b	-2.326	-0.037 ^a	-5.773	-0.018 ^b	-2.047	0.001	0.333	0.993
ESGV	0.004	1.286	1.003 ^a	368.998	0.098 ^a	17.927	-0.069 ^a	-13.662	-0.006	-0.862	-0.111 ^a	-11.704	0.004	1.484	0.992
DSI	0.003	0.590	1.009 ^a	297.527	0.023 ^a	3.336	-0.026 ^c	-4.038	0.016 ^c	1.910	-0.102 ^a	-8.646	0.007 ^c	1.782	0.988
SUSA	0.002	0.413	0.991 ^a	240.632	0.060 ^a	7.231	-0.054 ^a	-7.051	0.009	0.847	0.016	1.142	-0.008 ^c	-1.758	0.982
SPYX	0.001	0.184	0.982 ^a	313.265	0.018 ^b	2.784	-0.022 ^a	-3.720	0.025 ^a	3.282	-0.042 ^a	-3.856	-0.002	-0.562	0.989
NULV	-0.022 ^b	-2.435	0.899 ^a	124.028	0.056 ^c	3.863	0.206 ^c	15.229	-0.001	-0.056	0.196 ^c	7.750	-0.049 ^a	-6.059	0.937
ESML	0.000	0.021	1.009 ^a	181.438	0.784 ^a	70.238	0.128 ^a	12.379	-0.141 ^a	-10.266	-0.069 ^a	-3.563	0.017 ^b	2.787	0.977
NULG	0.020 ^b	2.041	1.026 ^a	129.791	0.097 ^a	6.135	-0.227 ^a	-15.394	-0.087 ^a	-4.447	-0.277 ^a	-10.050	0.032 ^a	3.588	0.948
NUSC	-0.006	-0.583	1.017 ^a	133.695	0.837 ^a	54.869	0.096 ^c	6.779	-0.094 ^c	-5.017	-0.052 ^c	-1.951	0.031 ^a	3.661	0.958
QQCLN	0.055	1.414	1.213 ^a	39.376	1.063 ^a	17.207	-0.182 ^a	-3.165	-0.735 ^a	-9.669	-0.482 ^a	-4.493	0.079 ^b	2.290	0.715
KRMA	-0.001	-0.066	0.965 ^a	93.364	0.033	1.586	0.022	1.143	-0.005	-0.187	-0.024	-0.680	-0.038 ^a	-3.260	0.892
NUMG	0.000	0.010	0.968 ^a	72.225	0.324 ^a	12.054	-0.288 ^a	-11.523	-0.274 ^a	-8.277	-0.158 ^a	-3.378	-0.001	-0.080	0.861
NUMV	-0.024 ^c	-1.952	0.992 ^a	101.450	0.367 ^a	18.726	0.297 ^a	16.275	-0.010	-0.433	-0.004	-0.131	-0.037 ^a	-3.353	0.921
JUST	0.001	0.207	0.970 ^a	281.016	-0.019 ^b	-2.767	-0.004	-0.616	-0.016 ^c	-1.849	0.012	0.966	-0.012 ^a	-3.023	0.986
SHE	-0.012	-1.460	0.960 ^a	144.576	0.076 ^c	5.676	0.053 ^a	4.297	-0.173 ^a	-10.522	-0.068 ^a	-2.942	-0.024 ^a	-3.282	0.954
LRGE	0.012	1.033	0.962 ^a	107.443	0.040 ^b	2.199	-0.244 ^a	-14.643	-0.022	-1.014	-0.232 ^a	-7.418	-0.044 ^a	-4.371	0.926
ACES	0.024	0.636	1.091 ^a	36.753	1.000 ^a	16.794	-0.164 ^a	-2.970	-0.798 ^a	-10.884	-0.285 ^b	-2.756	0.014	0.432	0.695
CNRG	0.055	1.397	1.065 ^a	34.144	1.063 ^a	16.992	-0.154 ^b	-2.659	-0.599 ^a	-7.779	-0.058	-0.530	0.131 ^a	3.778	0.639
ESG	0.004	0.669	0.973 ^a	216.973	0.006	0.699	-0.017 ^b	-2.089	-0.017	-1.527	-0.022	-1.392	-0.014 ^b	-2.865	0.978
ETHO	0.001	0.047	0.944 ^a	99.703	0.410 ^a	21.587	0.000	0.004	-0.078 ^a	-3.353	-0.108 ^a	-3.272	-0.024 ^b	-2.312	0.916

Symbol	α	T-stat	beta	T-stat	SMB	T-stat	HML	T-stat	RMW	T-stat	CMA	T-stat	MOM	T-stat	R ²
CHGX	0.005	0.412	0.924 ^a	89.355	0.106 ^c	5.093	-0.050 ^b	-2.613	-0.057 ^b	-2.233	-0.092 ^b	-2.549	-0.016	-1.379	0.887
CACG	0.000	0.014	0.987 ^a	109.674	0.096 ^c	5.341	-0.203 ^a	-12.132	-0.110 ^a	-4.955	-0.239 ^a	-7.613	-0.040 ^a	-4.030	0.929
ESGS	-0.001	-0.032	0.844 ^a	59.849	0.190 ^b	6.720	0.344 ^a	13.081	0.007	0.187	0.104 ^b	2.109	-0.085 ^a	-5.395	0.806
WOMN	0.007	0.469	0.902 ^a	79.067	0.041 ^c	1.783	-0.015	-0.720	-0.062 ^b	-2.193	-0.052	-1.311	0.033 ^b	2.579	0.854
NACP	0.006	0.530	0.879 ^a	105.827	0.011	0.667	-0.044 ^b	-2.864	-0.039 ^c	-1.908	-0.061 ^b	-2.112	-0.019 ^b	-2.093	0.915
Average	0.005	0.210	0.983	153.973	0.271	11.925	-0.025	-1.320	-0.132	-3.479	-0.089	-2.817	-0.003	-0.844	0.906
Min	-0.024	-2.435	0.844	34.144	-0.019	-2.767	-0.288	-15.394	-0.798	-10.884	-0.482	-11.704	-0.085	-6.059	0.639
Max	0.055	2.041	1.213	389.162	1.063	70.238	0.344	16.275	0.025	3.282	0.196	7.750	0.131	3.778	0.993

^a Statistically significant at 1%; ^b Statistically significant at 5%; ^c Statistically significant at 10%

Table 4.2: Multi-Factor Performance Regression Results (The International Sample)

This table presents the results of a multi-factor performance regression model via which the daily excess return, i.e., return minus the risk-free rate, of each internationally oriented ETF is regressed on the corresponding return of the S&P 500 Index, the Fama & French's (2015) SMB (small minus big) factor, the HML (high minus low book-to-price ratio) factor, the RMW (robust minus weak) factor, the CMA (conservative minus aggressive) factor, and the Carhart's (1997) MOM (momentum) factor, over the period 2019-2023.

Symbol	alpha	T-stat	beta	T-stat	SMB	T-stat	HML	T-stat	RMW	T-stat	CMA	T-stat	MOM	T-stat	R ²
ESGD	-0.017	-1.001	0.795 ^a	59.941	0.109 ^a	4.109	0.142 ^a	5.754	-0.074 ^b	-2.270	-0.064	-1.374	0.002	0.120	0.780
ESGE	-0.027	-1.089	0.768 ^a	38.846	0.126 ^a	3.184	0.087 ^b	2.359	-0.235 ^a	-4.809	-0.133 ^c	-1.935	0.032	1.469	0.607
VSGX	-0.019	-1.233	0.771 ^a	62.260	0.124 ^a	4.998	0.098 ^a	4.255	-0.124 ^a	-4.040	-0.081 ^c	-1.866	0.016	1.127	0.793
ICLN	0.030	0.824	0.966 ^a	33.173	0.659 ^a	11.290	-0.075	-1.374	-0.564 ^a	-7.841	-0.134	-1.320	0.109 ^a	3.376	0.595
XSOE	-0.022	-0.863	0.786 ^a	38.927	0.139 ^a	3.439	0.034	0.906	-0.220 ^a	-4.406	-0.130 ^c	-1.843	0.032	1.417	0.608
TAN	0.080	1.478	1.110 ^a	25.775	1.014 ^a	11.739	-0.219 ^b	-2.724	-0.737 ^a	-6.930	-0.358 ^b	-2.388	0.166 ^c	3.454	0.519
CRBN	-0.006	-0.852	0.890 ^a	146.504	0.075 ^a	6.160	0.040 ^a	3.500	-0.061 ^a	-4.068	-0.078 ^a	-3.704	0.009	1.338	0.954
EMCR	-0.015	-0.631	0.664 ^a	35.214	0.107 ^b	2.824	0.076 ^b	2.162	-0.233 ^a	-5.016	-0.097	-1.474	-0.003	-0.143	0.565
NUDM	-0.017	-0.950	0.782 ^a	54.697	0.128 ^a	4.464	0.115 ^a	4.327	-0.037	-1.036	-0.053	-1.066	0.001	0.049	0.746
CXSE	-0.019	-0.420	0.705 ^a	19.119	0.234 ^a	3.165	-0.174 ^b	-2.537	-0.447 ^a	-4.905	-0.144	-1.119	-0.020	-0.482	0.328
PBW	0.022	0.523	1.234 ^a	36.417	1.416 ^a	20.823	-0.215 ^a	-3.411	-0.939 ^a	-11.221	-0.356 ^a	-3.017	0.016	0.415	0.718
SDG	0.000	-0.029	0.708 ^a	53.220	0.173 ^a	6.480	0.007	0.300	-0.139 ^a	-4.236	0.073	1.576	0.029 ^c	1.984	0.732
EFAX	-0.018	-1.070	0.770 ^a	57.492	0.157 ^a	5.853	0.096 ^a	3.841	-0.035	-1.051	-0.082 ^c	-1.755	0.008	0.556	0.767
NUEM	-0.019	-0.733	0.684 ^a	33.800	0.167 ^a	4.102	0.025	0.655	-0.209 ^a	-4.178	-0.074	-1.055	0.011	0.466	0.545
ERTH	-0.009	-0.347	0.909 ^a	44.286	0.538 ^a	13.065	0.010	0.272	-0.357 ^a	-7.038	-0.266 ^a	-3.725	-0.014	-0.616	0.720
FAN	-0.001	-0.038	0.823 ^a	37.176	0.203 ^a	4.572	0.027	0.643	-0.344 ^a	-6.296	0.077	0.992	0.034	1.390	0.584
PBD	0.013	0.413	1.035 ^a	41.440	0.637 ^a	12.723	-0.057	-1.222	-0.687 ^a	-11.136	-0.189 ^b	-2.174	0.061 ^b	2.181	0.701
NZAC	-0.007	-0.677	0.884 ^a	111.637	0.071 ^a	4.474	0.013	0.852	-0.054 ^b	-2.783	-0.053 ^c	-1.936	-0.011	-1.206	0.923
EEMX	-0.023	-0.945	0.744 ^a	37.940	0.114 ^b	2.898	0.072 ^c	1.975	-0.236 ^a	-4.869	-0.131 ^c	-1.909	0.034	1.579	0.595

Symbol	α	T-stat	beta	T-stat	SMB	T-stat	HML	T-stat	RMW	T-stat	CMA	T-stat	MOM	T-stat	R ²
EVX	0.007	0.346	0.852 ^a	50.973	0.428 ^a	12.754	0.123 ^a	3.937	-0.015	-0.365	0.110 ^c	1.894	-0.072 ^a	-3.890	0.750
KGRN	0.021	0.387	0.668 ^a	15.709	0.343 ^a	4.014	-0.159 ^b	-2.011	-0.624 ^a	-5.940	-0.154	-1.036	0.002	0.042	0.280
EBLU	-0.001	-0.058	0.842 ^a	53.523	0.186 ^a	5.903	0.056 ^c	1.908	0.049	1.259	0.036	0.664	-0.041 ^b	-2.329	0.739
EASG	-0.014	-0.737	0.733 ^a	47.951	0.097 ^a	3.170	0.101 ^a	3.557	-0.048	-1.261	-0.062	-1.170	-0.007	-0.392	0.693
RNRG	-0.023	-0.853	0.723 ^a	33.901	0.239 ^a	5.592	0.057	1.424	-0.454 ^a	-8.621	0.078	1.051	0.020	0.822	0.562
EMSG	-0.026	-0.960	0.706 ^a	32.679	0.127 ^a	2.929	0.052	1.292	-0.270 ^a	-5.055	-0.140 ^c	-1.863	0.031	1.305	0.530
ESGN	-0.017	-0.849	0.652 ^a	39.818	0.110 ^a	3.365	0.188 ^a	6.162	-0.047	-1.157	0.008	0.137	-0.048 ^b	-2.653	0.627
Average	-0.005	-0.399	0.816	47.785	0.297	6.465	0.020	1.415	-0.275	-4.587	-0.092	-1.208	0.015	0.438	0.652
Min	-0.027	-1.233	0.652	15.709	0.071	2.824	-0.219	-3.411	-0.939	-11.221	-0.358	-3.725	-0.072	-3.890	0.280
Max	0.080	1.478	1.234	146.504	1.416	20.823	0.188	6.162	0.049	1.259	0.110	1.894	0.166	3.454	0.954

^a Statistically significant at 1%; ^b Statistically significant at 5%; ^c Statistically significant at 10%

international one, especially when cumulative returns are considered. The domestic ETFs beat their international peers in risk-adjusted return terms too. However, both groups fail to achieve any significant alpha, rendering the responsible ETFs unsuitable to use in strategies that seek to outperform the local broad market index. Moreover, the applied regression analysis shows that the Fama and French's size, value, robustness and conservativeness factors, as well as the Carhart's momentum factor matter when assessing the performance of responsible ETFs in the United States.

The main inference drawn from our analysis is that ETF investors who wish to combine social and environmental impact with decent financial gains should do so via investing in locally oriented ETFs. By doing so, investors can also avoid some extra cost charges imposed by the international responsible ETFs due to their very nature of being internationally focused.

Note

1. The daily data of the Fama and French three "traditional" factors, the robust minus weak factor, the conservative minus aggressive factor, and the momentum factor for the stock market in the US, as well as the risk-free rate are found on http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

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