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COVID-19: PERFORMANCE OF ESG ETFS AND ESG ETFS vs THEIR DECLARED INDEXES

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Abstract

This paper adds knowledge to ESG funds by investigating the performance of 126 ESG ETFs during the Covid-19 market stress. My findings show that ESG ETFs outperform the market during the pandemic, suggesting they are better investment funds. This asserts that ESG funds are more likely to have actual investment performance value than just being marketing tools. In addition, this paper examines whether ESG ETFs attempt to track their indexes exactly, and the results show strong evidence that ETF funds do an excellent job of tracking their indexes they follow before Covid-19, during Covid-19 and Covid-19 recovery. This paper also discusses why ESG funds are more risk-resilient investment tools during a crisis. My findings and discussions aim to inform investors and portfolio managers in decision-making during this outbreak.

JEL: G1, G12, G14, M 14

Keywords: Covid-19, ESG, ETFs, indexes, performance, and ratings

1. Introduction

ESG (environmental, social and governance) funds are growing rapidly. ESG investments are worth over 35 trillion dollars globally in 2020[1]. In the U.S, EGS investments are worth 8.4 trillion dollars at the beginning of 2022[2], and Broadridge Financial Solutions estimates these investments will grow by approximately 30 trillion dollars by 2030[3]. ESG funds are well-known in terms of reducing financial risk, especially during the Covid-19 pandemic. Numerous papers have reported that ESG investments outperform the market during Covid-19, i.e., Albuquerque et al. (2020), Singh (2020), Broadstock et al. (2021), Omura et al. (2021) and Rubbaniy (2021).

As ESG investments become more and more popular, the performance of ESG mutual funds has been studied extensively (Bollen, 2009); Renneboog et al., 2011; Nofsinger & Varma, 2014; Hartzmark & Sussman, (2019). The literature has confirmed the outperformance of mutual funds during the outbreak, suggesting they are more risk-resilient investment tools, i.e., Pastor and Vorsatz (2020), Singh (2020) and Samira et al. (2020). However, studying the performance of ESG ETFs during this pandemic

[1] Source: GSIR-20201.pdf (gsi-alliance.org)
[2] Source: Even as ESG market narrows, money managers in the space prioritize climate | S&P Global Market Intelligence (spglobal.com)
[3] Source: How ESG investment returns are growing as market evolves | Sustainability Magazine

is still scant. There are very few early studies covering the topic of ESG ETFs. For instance, Kanuri (2020) examines the risk and return of ESG ETFs and compares them with investable proxies for U.S. and global equity markets. His finding shows that ESG ETFs underperform compared with others during the period 2005-2019. However, his study is before the Covid-19 pandemic. Following a similar research line but during the Covid-19 outbreak, Folger-Laronde et al. (2020) analysed the difference in the performance of ESG ETFs with different Eco-fund ratings. They find that higher sustainability rating ETFs do not prevent financial losses during the Covid-19 crisis. Their study does not mention the risk resilience of ETFs during the crisis, and it is limited to simple econometrics methods: ANOVA and multivariate regression. On the contrary, Pavlova and De Boyrie (2022) employs numerous econometric models on a sample of 62 sustainable EGS ETFs during the Covid-19 market crash (February- May 2020); they find that sustainability ratings of ESG ETFs do not outperform the market during the crash period, suggesting ESG ETFs are not risk resilient during this outbreak. Their paper is limited to the sample period, which is only halfway through the pandemic, and there are no theories or empirical methods justifying their reason for choosing the Covid-19 period.

This paper investigates the performance of ESG ETFs during Covid-19 market stress by employing five different models: CAPM, Fama-French 3-factor model, Fama-French 3-factor plus a momentum, Fama-French 5-factor model, and Fama-French 5-factor model plus a momentum. Econometric models, including Chow (1960) and Bai-Perron (1998 and 2003), are utilised to justify the appropriate length of the market stress period. By using 126 ESG ETFs from January 2019 to March 2022, my empirical analysis highlights interesting results. First, the findings show that ESG ETFs outperform the market, suggesting ESG ETFs are better investment tools during the pandemic. This paper adds the novel finding of the outperformance of ESG ETFs, which is not reported in the previous literature. Second, it is trustworthy that higher-risk ETFs are associated with better performance. This supports that investors and portfolio managers consider the financial risks while making decisions (Ferriani et al., 2021).

ESG ETFs are purposely created to track their declared indexes exactly. This paper aims to address the question "whether ESG ETFs attempt to track their declared indexes exactly during the Covid-19 market stress". The results show that ESG ETFs do an excellent job of tracking the indexes they follow before Covid-19, during Covid-19 and Covid-19 recovery.

Additionally, this paper explains why ESG funds outperform the market: (1) Investors are loyal to ESG firms, (2) They are optimistic about the future, (3) ESG investors' tastes make firms more valuable, (4) They consider the financial risk while incorporating sustainability and ESG-related decisions into their stock picks.

My paper makes the following major contributions to the extant literature. First, it adds more knowledge on the ESG ETFs, specifically the risk resilience of ESG ETFs during Covid-19. This asserts that ESG funds are more likely to have actual investment performance value than just being marketing tools. Second, this study confirms the outperformance of ESG ETFs funds during the outbreak. There are mixed findings on EGS performance. While Albuquerque et al. (2020), Singh (2020), Broadstock et al. (2021), Omura et al. (2021), and Rubbaniy et al. (2021) document that ESG investments outperform the market during the pandemic, other papers indicate that ESG investments strategies do not pay during Covid-19, including Demers et al. (2021), Takahashi and Yamada (2021) and Pavlova and De Boyrie (2022). Third, lower-rated ETFs (higher-risk ETFs) outperform better than higher-rated ones (lower-risk ETFs), suggesting investors are rewarded more for bearing higher risk. Four, this paper adds novel, strong evidence of the performance of ESG ETFs in tracking their declared indexes before Covid-19, during Covid-10 and Covid-19 recovery. Lastly, my findings and discussions are to inform investors and portfolio managers in the decision-making process, especially during this outbreak.

The paper is organised as follows: Section 2 discusses the data and methodology, section 3 presents the empirical results, and section 4 provides the conclusions.

2. Data and Methodology

2.1. Data

Recent research implicating ESG firm performance during the pandemic has selected different periods of the Covid-19 crisis (Pastor and Vorsatz (2020)[4], Pavlova and De Boyrie (2022)[5], however, their sample periods do not include the Covid-19 continuing periods and are not justified by any theories or econometrics models. This paper follows Chen et al. (2022) to employ two tests: (1) Chow (1960) and (2) Bai and Perron (1998 and 2003) to determine the Covid-19 market stress period. To be consistent with Ferriani et al. (2021) and Pavlova and De Boyrie (2022), ETF funds are separated based on the ratings from Morningstar: the globes variable going from 1 (high ESG risk) to 5 (low EGS risk)[6].

The empirical results are reported in Table 1. Based on the Chow test, all F-statistics are statistically significant, indicating the null hypothesis of no break is rejected. Bai-Perron test shows that ETFs returns change between February 2020 and February 2021. Based on the test results, I define Covid-19 market stress as the period in which ESG ETFs return time series have structural breaks or changes. Therefore, the period from February 2020 to February 2021 is chosen as the period of Covid-19 market stress. Based on this market stress period, the length of the sample is extended and divided into three sub-periods:

(1) Before Covid-19 market distress (January 2019 – January 2020)

(2) During Covid-19 market distress (February 2020 – February 2021)

(3) Covid-19 Recovery (March 2021– March 2022)

U.S ESG ETFs and ESG indexes are collected from Thomson Reuters' Refinitiv database, and accounting data is collected from CRSP during the period January 2019- March 2022. Only ETFs whose ratings are available at Morningstar.com and ETF.com, are included in the sample. There are a total of 126 ESG ETFs and 126 ESG ETF indexes. Fama-French factors are specified on their website[7].

Table 1: Results from Chow and Bai-Perron Tests

	Globes				
	5	**4**	**3**	**2**	**1**
Panel A: Chow test					
Structural break at observation Feb 1, 2020	28.61***	17.85***	44.92***	36.55***	40.18***
Structural break at observation Feb 28, 2021	19.75***	22.56***	39.19***	20.17***	33.51***
Panel B: Bai -Perron test					
Break Point 1	19/02/2020	20/02/2020	18/02/2020	17/02/2020	20/02/2020
Break Point 2	17/02/2021	15/02/2021	12/02/2021	21/02/2021	22/02/2021

Note: Chow and Bai- Perron tests are employed to determine the Covid-19 market stress period.
ETFs are separated based on the ratings from Morningstar. The globes variable goes from 1 (highest risk) to 5 (lowest risk).
**, **, ** significance at 90%, 95% and 99%, respectively.*

[4] Pastor and Vorsatz (2020) choose Covid-19 pandemic period from Feb 20 to March 23, 2020.
[5] Pavlova and De Boyrie (2022) select Covid-19 crisis period from Feb 20 to May 29, 2020.
[6] Globe variable ratings from 1 to 5 are named by Morningstar as Low, Below Average, Average, Above Average and High sustainability. ETF Investing | Morningstar
[7] Kenneth R. French - Data Library (dartmouth.edu)

2.2. Methodology

Following Pastor and Vorsatz (2020), Luo (2022) and, Pavlova and De Boyrie (2022), I calculate the abnormal return performance of EGS funds by employing five different models:

CAPM:

$$R_t - R_{ft} = \alpha_{BC} D_{BC,t} + \alpha_{DC} D_{DC,t} + \alpha_{CR} D_{CR,t} + \beta_1 * (R_{mt} - R_{ft}) + \varepsilon_t \quad (1)$$

Fama- French 3-factor model:

$$R_t - R_{ft} = \alpha_{BC} D_{BC,t} + \alpha_{DC} D_{DC,t} + \alpha_{CR} D_{CR,t} + \beta_1 * (R_{mt} - R_{ft}) + \beta_2(SMB_t) + \beta_3(HML_t) + \varepsilon_t \quad (2)$$

Fama-French 3-factor plus a momentum:

$$R_t - R_{ft} = \alpha_{BC} D_{BC,t} + \alpha_{DC} D_{DC,t} + \alpha_{CR} D_{CR,t} + \beta_1 * (R_{mt} - R_{ft}) + \beta_2(SMB_t) + \beta_3(HML_t) + \beta_4(WML_t) + \varepsilon_t \quad (3)$$

Fama- French 5-factor model:

$$R_t - R_{ft} = \alpha_{BC} D_{BC,t} + \alpha_{DC} D_{DC,t} + \alpha_{CR} D_{CR,t} + \beta_1 (R_{mt} - R_{ft}) + \beta_2(SMB_t) + \beta_3(HML_t) + \beta_4(RML_t) + \beta_5(CMA_t) \varepsilon_t \quad (4)$$

Fama- French 5-factor model plus a momentum:

$$R_t - R_{ft} = \alpha_{BC} D_{BC,t} + \alpha_{DC} D_{DC,t} + \alpha_{CR} D_{CR,t} + \beta_1 (R_{mt} - R_{ft}) + \beta_2(SMB_t) + \beta_3(HML_t) + \beta_4(RML_t) + \beta_5(CMA_t) + + \beta_6(WML_t) \varepsilon_t \quad (5)$$

Where

R_t: equally weighted return on day t for a group of ETFs from Morningstar (from 1 to 5) or MSCI ESG rating (BB, BBB, A, AA, and AAA)

R_{ft} : risk-free rate

$R_t - R_{ft}$: excess return on the market

$SMB_t, HML_t, RML_t, CMA_t$: size, value, profitability, and investment factors, respectively

WML_t : momentum

$D_{BC,t}$: dummy variable that takes value of 1 before the Covid-19, and 0 otherwise.

$D_{DC,t}$: dummy variable that takes value of 1 during the Covid-19, and 0 otherwise.

$D_{CR,t}$: dummy variable that takes value of 1 during Covid-19 recovery, and 0 otherwise.

T-test for the mean difference in cumulated returns between low and high ESG risk funds.

To be consistent with Elton et al. (2019), when comparing the performance of ESG ETFs vs their indexes, performance is measured in two ways. (1) performance is measured by the difference between the daily return[8] of the fund and the index it follows (in percentage). Then I examine its mean and standard deviation. (2) performance is measured by the daily return of funds against the index by employing three characteristics of regression, including the intercept, the coefficient beta, and the coefficient of determination (R^2).

3. Empirical Results and Discussions

3.1. Descriptive Statistics

Table 2: Summary Statistics of ESG ETF Funds Based on Morningstar Ratings

Number of funds					
Globes	**5**	**4**	**3**	**2**	**1**
Number	7	25	52	28	14
Percentage	6%	20%	41%	22%	11%
Total					126
Daily returns (%)					
Globes	**5**	**4**	**3**	**2**	**1**
Before Covid-19 market distress					
Mean	0.1645	0.1811	0.2173	0.3153	0.3969
Min	-3.1778	-3.364	-5.4819	-3.2591	-4.0178
Max	0.3917	0.5112	0.5726	6.9132	9.0112
St. Dev.	0.1625	0.1709	0.9152	0.8791	1.352
During Covid-19 market stress					
Mean	-0.1672	-0.1822	-0.2103	-0.226	-0.2972
Min	-16.7601	-17.0189	-17.9561	-18.0123	-20.1223
Max	10.1125	10.9726	11.0145	11.9875	15.1125
St. Dev.	3.1179	3.5612	3.9912	4.2215	5.1261
Covid-19 Recovery					
Mean	-0.1212	-0.1299	-0.1778	-0.1821	-0.2217
Min	-11.0123	-12.4516	-12.9861	-14.8717	-16.0126
Max	11.0125	11.9978	13.1197	14.0122	16.1562
St. Dev.	2.1569	2.9785	3.0119	3.9784	4.3351

Note: ETFs are separated based on the ratings from Morningstar. The globes variable goes from 1 (highest risk) to 5 (lowest risk).
Before Covid-19: January 2019 - January, 2020
During Covid-19: February 2020 - February, 2021
Covid-19 Recovery: March 2021 - March, 2022

Table 2 summarizes the descriptive statistics of ESG ETF funds based on Morningstar ratings. The majority of funds belong to Globe 3 (52 funds- 41%), followed by Globe 2 (28 funds-22%), globe 4 (25 funds-20%), globe 1 (14 funds- 11%) and Globe 5 (7 funds-6%). In terms of daily returns, ETFs with higher risk

[8] More details are specified in Elton et al (2019), pp. 267-268.

are associated with greater returns before Covid-19 market distress (0.3969%; 0.3153%; 0.2173%; 0.1811% and 0.1645% for globes 1 to 5, respectively). On the contrary, during Covid-19 crash and Covid-19 recovery, lower-rated ETFs faced more losses than higher-rated ones (i.e., (-0.2972%) for globe 1, (-0.2260%) for globe 2, (-0.2103%) for globe 3, (-0.1822%) for globe 4 and (-0.1672%) for globe 5. This indicates that lower-rated ETFs performed better before the pandemic but suffered more losses during the market crash and Covid-19 recovery.

3.2. Performance of ESG ETFs Based on Ratings

3.2.1. Performance of ESG ETFs Based on Morningstar Ratings

Table 3 results show that overall, ESG ETFs outperform the market during the Covid-19 since all alphas are positive and significant (i.e., 0.0412 for globe 5, 0.0511 for globes 4, 0.0578 for globe 3, 0.0591 for globe 2 and 0.0601 for globe 1 in model (1); 0.0325 for globe 5, 0.0356 for globe 4, 0.0416 for globe 3, 0.0455 for globe 2 and 0.0478 for globe 1 in model (2)), suggesting ESG ETFs are better investment tools during this pandemic. This novel finding adds additional information to the decision-making process for investors and portfolio managers.

In addition, ETFs with higher risk are associated with better performance[9], for instance, alpha in globe 1 is higher than alphas in globes 2, 3, 4 and 5 in model (1) (0.0601 for globe 1 vs 0.0591 for globe 2, 0.0578 for globe 3, 0.0511 for globe 4 and 0.0412 for globe 5). My results relate to the findings of Albuquerque et al. (2020), Pastor and Vorsatz (2020), Singh (2020), Broadstock et al. (2021), Omura et al. (2021), Rubbaniy et al. (2021) and Pavlova and De Boyrie (2022). This indicates that investors and portfolio managers take into account the financial risks when making decisions, which is consistent with Ferriani et al. (2021) that risk has been significantly considered during the Covid-19 crisis. Higher risk is rewarded with greater return. There is no clear observation on the performance of ESG ETFs before Covid-19 and during Covid-19 recovery since most of the alphas are not statistically significant except for alphas in globe 1 and globe 2 in model (5) before Covid-19 market stress (0.0623 for globe 1 and 0.0521 for globe 2).

3.2.2. Performance of ESG ETF Based on MSCI Ratings

For a robust test, ETF funds are separated based on the ratings Morgan Stanley Capital International (MSCI): rating variables include BB, BBB, A, AA, AAA[10]. Table 4 results confirm the outperformance of ESG ETFs during the pandemic since all alphas are positive and significant, for instance, 0.0451 for AAA funds, 0.0497 for AA funds, 0.0512 for A funds, 0.0522 for BBB funds and 0.0534 for BB funds in model (1); 0.0325 for AAA funds, 0.0391 for AA funds, 0.0411 for A funds, 0.0432 for BBB funds and 0.0451 for BB funds in model (2). Additionally, the results are consistent with Morningstar ratings that lower-rated ETFs outperform better than higher-rated ones[11] (i.e., 0.0534 for BB funds vs 0.0522 for BBB funds, 0.0512 for A funds, 0.0391 for AA funds and 0.0325 for AAA funds in model (1)). There is no indication regarding ETFs performance before Covid-19 and Covid-19 recovery because most alphas are not statistically significant.

[9] T-tests are also performed to test the mean difference in cumulated returns between low and high ESG risk funds, and the results are not reported here but support that lower-rated funds perform better than higher-rated ones.

[10] MSCI ratings include BB, A, AA, and AAA that are rated by Morgan Stanley Capital International. ESG Investing: ESG Ratings - MSCI

[11] T-tests are also performed to test the mean difference in cumulated returns between low and high ESG risk funds, and the results are not reported here but support that lower-rated funds perform better than higher-rated ones.

Table 3: Performance of ESG ETFs Based on Morningstar Ratings

Globes	Period	Alpha (%)			
		-1	-2	-3	-4
5	Before Covid-19	0.0097	0.0875	0.0529	0.0674
		-2.01	-1.75	-2.11	-1.55
	During Covid-19	0.0412**	0.0325**	0.0293**	0.0212**
		-2.75	-2.11	-2.55	-2.12
	Covid-19 Recovery	-0.0178	-0.0356	0.0526	0.0425
		(-1.55)	(-2.16)	-1.78	-1.82
4	Before Covid-19	-0.0716	0.0267	0.0356	-0.0762
		(-1.78)	-1.54	-1.98	(-2.11)
	During Covid-19	0.0511***	0.0356**	0.0319**	0.0279**
		-3.42	-2.67	-2.58	-2.69
	Covid-19 Recovery	0.0789	-0.0345	0.054	0.0751
		-1.34	(-1.54)	-1.56	-1.17
3	Before Covid-19	0.0672	0.0871	0.0245	0.0512
		-1.82	-1.88	-1.24	-1.78
	During Covid-19	0.0578**	0.0416**	0.0342**	0.0305**
		-2.64	-2.75	-2.87	-2.71
	Covid-19 Recovery	-0.0234	-0.0324	0.0234	0.0532
		(-1.05)	(-1.23)	-1.26	-1.53
2	Before Covid-19	0.0657	0.0871	0.0234	0.0219
		-1.16	-1.56	-1.22	-1.25
	During Covid-19	0.0591**	0.0455**	0.0387**	0.0329**
		-2.85	-2.72	-2.55	-2.51
	Covid-19 Recovery	0.0452	0.0215	-0.0326	0.0213
		-1.21	-1.62	(-1.39)	-1.7
1	Before Covid-19	0.0412	0.0516	0.0718	0.0212
		-1.23	-1.55	-1.29	-1.38
	During Covid-19	0.0601***	0.0478**	0.0412**	0.0355**
		-3.56	-2.85	-2.47	-2.22
	Covid-19 Recovery	0.0345	0.0616	0.0413	0.0214
		-1.31	-1.18	-1.52	-1.78

Note: Alphas are measured by five different models: (1) CAMP, (2) FF- 3 factors, (3) FF- 3-factor plus a momentum, (4) FF-5 factors and (5) FF- 5 factors plus a momentum.
**, **, ** significance at 90%, 95% and 99%, respectively.*
T-statistics are in parentheses.

Table 4: Performance of ESG ETFs Based on Morningstar Ratings

MSCI Ratings	Period	Alpha (%)			
		-1	-2	-3	-4
AAA	Before Covid-19	0.0124	0.0316	0.0524	0.0623
		-1.75	-1.11	-1.56	-1.21
	During Covid-19	0.0451**	0.0325**	0.0213**	0.0356**
		-2.77	-2.54	-2.2	-2.81
	Covid-19 Recovery	0.0125	0.0314	0.0512	0.0612
		-1.29	-1.67	-1.12	-1.78
AA	Before Covid-19	0.0425	0.0523	0.0312	0.0425
		-1.32	-1.52	-1.29	-1.1
	During Covid-19	0.0497***	0.0391**	0.0311**	0.0397**
		-3.37	-2.89	-2.75	-2.58
	Covid-19 Recovery	-0.0234	-0.0123	0.0432	0.0612
		(-1.99)	(-1.22)	-1.83	-1.44
A	Before Covid-19	-0.0123	0.0123	0.0456	0.0532
		(-1.15)	-1.77	-1.27	-2.01
	During Covid-19	0.0512**	0.0411**	0.0356**	0.0412*
		-2.82	-2.85	-2.77	-2.01
	Covid-19 Recovery	0.0167	0.0678	0.0189	0.0542
		-1.26	-1.42	-1.76	-1.22
BBB	Before Covid-19	0.0617	0.0425	-0.0123	0.0432
		-1.33	-1.12	-1.74	-1.55
	During Covid-19	0.0522*	0.0432**	0.0398*	0.0433**
		-2.07	-2.25	-2.05	-2.97
	Covid-19 Recovery	-0.0425	0.0234	0.0126	0.0723
		(-1.16)	-1.11	-1.24	-1.72
BB	Before Covid-19	0.0321	0.0524	0.0412	0.0748
		-1.05	-1.98	-1.78	-1.67
	During Covid-19	0.0534**	0.0451**	0.0411**	0.0467*
		-2.26	-2.75	-2.58	-2.02
	Covid-19 Recovery	0.0345	0.0652	0.0312	0.0422
		-1.13	-2.12	-1.67	-1.32

Note: Alphas are measured by five different models: (1) CAMP, (2) FF- 3 factors, (3) FF- 3-factor plus a momentum, (4) FF-5 factors and (5) FF- 5 factors plus a momentum.
ETFs are divided based on MSCI ratings.
**, **, ** significance at 90%, 95% and 99%, respectively.*
T- statistics are in parentheses.

Once again, ETFs outperform the market, suggesting the risk resilience of ESG ETFs during this outbreak. This supports the idea that ESG funds are more likely to have an actual investment performance value than just being marketing tools.

3.3. Performance of ESG ETFs vs their Indexes

Table 5 represents the performance of ESG ETFs, and their declared indexes as discussed above. The results show that ETFs have a higher return than the indexes they follow (mean = 0.0019%, 0.0017% and 0.0015% before Covid-19, during Covid-19 and Covid-19 recovery, respectively, in column 1) [12]. On the second measurement of performance based on time series regression, the coefficient beta is exactly 1 and significant before Covid-19, during Covid-19 and Covid-19 recovery (column 4), which indicates that ETFs do an excellent job of tracking their declared indexes, and ESG ETFs remain true to ESG principles before the Covid-19, during Covid-19 and Covid-19 recovery. This adds novel and strong evidence of the excellent job of ETFs in tracking their declared indexes during three periods.

Table 5: Difference in Return of ETFs vs. their Indexes and Regression Results

Period	Mean (%) -1	Std. Dev. (%) -2	Intercept -3	Beta -4	R^2 -5
Before Covid-19	0.0019	0.0179	0.0028	1** -2.85	0.9989
During Covid-19	0.0017	0.0301	0.0037	1** -2.52	0.9981
Covid-19 Recovery	0.0015	0.0175	0.0019	1** -2.64	0.9985

Note: (1): indicate the average daily return difference between ESG ETFs and the indexes they follow. (2): indicate the standard deviation of the daily return difference between ESG ETFs and the indexes they follow. (3), (4) and (5): represent the intercept, coefficient beta and from time series regression of return for ETFs against the indexes they follow.
**, **, ** significance at 90%, 95% and 99%, respectively.*
T- statistics are in parentheses.

3.4. Discussions

Why ESG funds outperform the market during Covid-19 market stress can be explained in four ways. First, investors are loyal to ESG firms. Albuquerque et al. (2019) and Albuquerque et al. (2020) assert that investor loyalty plays an important role in the performance of ESG funds; specifically, their loyalty to ESG firms is to benefit ESG firms' stock performance and resiliency. Albuquerque et al. (2019) provide the benefit of product differentiation strategy that investors are more loyal and more subjective to lower price-elasticity of demand for their ESG funds/stocks. A lower price-elastic demand allows the firm to charge higher prices and have higher profit margins that lead to lower operating leverage, thus lower systematic risk and increasing firm value. Following the same line, Albuquerque et al. (2020) developed a different strategy based on advertising expenditures to measure investor loyalty to ESG firms during Covid-19. They find that high advertising expenditures are associated with high customer loyalty. In addition, stock return is more pronounced for firms with high advertising expenditures, suggesting firm performance and resilience are associated with investor loyalty during the pandemic.

Second, investors are optimistic about the future of sustainable funds. Pastor et al. (2020) find that investors retain their commitments to sustainability during the COVID-19 crisis, suggesting they are optimistic about the future. Their findings indicate that investors have considered sustainable funds necessities rather than luxury goods. Third, ESG investors' tastes make firms more valuable. Pastor et al. (2021) report that ESG investors' tastes affect the relative performance of green and brown firms[13];

[12] T- test are performed to test the mean difference of the daily return between ETFs and their indexes for three periods: before, during Covid-19 and Covid-19 recovery. The results are not reported here but show that there is a significant difference in their daily return between ETFs and their index for all three periods.

[13] "Green firms" generate positive externalities for society while "brown firms" impose negative externalities.

specifically, they boost green firm values while hurting brown ones. Their results show that investor tastes for green holdings affect asset prices. They are willing to pay more for greener firms, thereby lowering the firms' costs of capital and increasing the firm value compared to brown ones. Lastly, investors consider the financial risk while incorporating sustainability and ESG-related decisions into their stock picks. Ferriani et al. (2021) report that risk has been significantly considered in investor decision-making, especially during the Covid-19 crisis.

4. Conclusions

The Covid-19 pandemic has had tremendous impacts on the investment areas. This paper aims to contribute to the literature by first investigating the performance of ESG ETFs during Covid-19 market stress. The results show that ETF funds outperform the market, suggesting ESG ETFs are more risk-resilient investment tools during this outbreak. This also indicates that ESG ETFs are not merely marketing tools but instead provide the actual investment value. In addition, higher rating ESG funds are associated with better performance, supporting that bearing higher risk may be rewarded with greater return. Second, this paper examines whether ESG ETFs track their declared indexes exactly during this market distress. The findings show that ETFs do an excellent job of tracking their declared indexes before Covid-19, during Covid-19 and Covid-19 recovery with high R^2 (0.9989, 0.9981 and 0.9985, respectively). My paper adds clear evidence of the excellent job of ESG ETFs in tracking their indexes they follow. Lastly, this paper provides a discussion on why ESG funds outperform the market during this pandemic. My findings and discussions aim to inform investors and portfolio managers in decision-making during this Covid-19 market stress.

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