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Abstract

In this paper we analyse the performance and flows of ESG active equity UCITS funds relative to their non-ESG peers in a period of financial distress, corresponding to the first wave of COVID-19. Compared to other crisis events in the recent past, it has the advantage of looking at a complete exogenous shock affecting the economic and financial market as a whole. An analysis of performance and flows of EU ESG funds versus EU non-ESG funds during stressed market conditions has been lacking so far. Moreover, it is a first attempt to address the heterogeneity within the cohort of active funds with some active funds significantly outperforming compared to others. The main findings confirm this hypothesis and show that ESG funds outperformed and received higher net flows than their non-ESG peers.

JEL Classifications: G01, G11, G14, G23

Keywords: Investment funds, UCITS, ESG, management style, performance.

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Non-technical summary

This paper looks into the flows and performance of funds following environmental, social and governance (ESG) strategies during the peak of the COVID-19 crisis. We specifically focus on the 2020 COVID-19 market turmoil. Compared to other crisis events in the recent past, such as the energy crisis starting in February 2022, analysing this specific event has the advantage of looking at an exogenous shock external to the financial market and affecting the market as a whole. Our analysis seeks to contribute to two of ESMA's key focus areas: sustainable finance and retail investor protection. Given the interest of the EU in encouraging a financial system that supports sustainable growth, it provides enhanced information through a focused analysis, which has been lacking so far, on EU ESG fund performance and flows during a stress period. Moreover, it is a first attempt to address the heterogeneity within the cohort of active funds with some active funds significantly outperforming compared to others. This adds to the active and passive fund investing debate, which has proven to be even more prominent during periods of stress.

This article contributes to the literature by analysing the performance of European ESG funds between 19 February 2020 and the end of June 2020, a period characterised by a strong market downturn followed by a fast recovery of equity prices and a stabilisation at elevated levels. It is based on data retrieved from Morningstar Direct and focuses on 2,581 equity active UCITS domiciled in the EU. We analyse whether being an ESG fund had any impact on the fund performance and flows. Given that there is no widely accepted definition or EU-harmonised label for ESG funds we use several variables reflecting different ways to identify ESG funds. Moreover, this analysis is a first attempt to address a particular aspect within the wider debate of active and passive fund investing, namely the heterogeneity within the cohort of active funds with some active funds significantly outperforming compared to others. We find that ESG active UCITS outperform non-ESG active UCITS during the ten weeks of the first COVID-19 outbreak. We also report on the positive role of sustainable attributes on the investment fund flows during the COVID-19 crisis by demonstrating that ESG funds are associated with higher net flows.

As the quality and quantity of data increases following the improvements in definitions and the regulatory efforts undertaken, a deeper analysis of the drivers behind investor choices and observed outcomes could be conducted in the future.

1 Introduction

Over the last few years, there has been a major increase in the demand for sustainable products by European investors. Net flows into EU investment funds following environmental, social and governance (ESG) strategies have accelerated, while net flows for non-ESG funds were more subdued, with period of strong outflows. This translated in a significant asset value growth for ESG funds compared to their peers.[1] In turn, the offering of ESG investment products increased. Asset managers either launched new ESG funds or introduced ESG elements into the strategy of existing funds.[2]

This article contributes to the literature analysing the performance of ESG funds also focusing on the 'hedging' reasons that might drive investors preferences towards ESG funds in times of market stress. Nofsinger and Varma (2014) find that ESG characteristics drive returns in an asymmetric way: ESG funds outperform non-ESG funds in the US during market crises but underperform in non-crisis periods. The underlying hypothesis is that ESG funds hold up better during market crisis periods because they dampen the downside risk (also see Verwijmeren and Derwall, 2010). Focusing on US funds, Hartzmark and Sussman (2019) show that funds with the highest Morningstar ESG rating receive higher flows compared to those with the lowest ESG rating. Using Morningstar ESG assessment, Pastor and Vorsatz (2020) show that US mutual funds with higher sustainability ratings (more globes) have higher benchmark-adjusted returns. They also look at the components of the ESG classification, finding that outperformance is mainly driven by the environmental sustainability component. Ferriani and Natoli (2020), focusing on a sample of equity mutual funds invested in the global equity large-cap category, show that, during the first wave of the COVID-19 pandemic, investor preferences went to low-ESG risk funds (identified by the highest Morningstar sustainability rating). Their results inform on the potential of ESG preferences as a driver of portfolio choices during crises, while re-opening the debate on the use of ESG scores within a risk-return strategy. During the Covid-19 crisis, low-ESG risk funds seemed to perform significantly better than high-risk ones. The authors conclude that this seems to be consistent with the idea that low-ESG-risk funds, or highly rated ESG funds, were offering some hedge against losses.

In line with these analyses, the article distinguishes between two ways of identification of ESG features following Morningstar Direct capturing different aspects: ESG classification and Sustainability Rating. The two do not overlap. While the sustainability rating is purely data

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1 ESMA, Performance and Costs of EU Retail Investment Products, 2022.

2 Financial Times, "ESG demand prompts more than 250 European funds to change tack", February 2021. ESMA, 2021, TRV No.1 2021.

driven and is based on a fund portfolio holding, the ESG flag assigned by Morningstar takes into account the fund intentions and goals.[3]

Previous studies, either do not specifically analyse a crisis period or do not specifically have an EU geographical focus. We aim to fill this gap. Moreover, this analysis is a first attempt to address a particular aspect within the wider debate of active and passive fund investing, namely the heterogeneity within the cohort of active funds with some active funds significantly outperforming compared to others (Morningstar, 2021).[4] Numerous studies have tested the hypothesis of active and passive fund performance during stressed market conditions. Research findings are diverse according to the period considered. Results in Kosowski (2011) support the view that active mutual fund managers add value in recessions, when investors' marginal utility of wealth is high.[5] On the other hand, earlier research by Vanguard (2009), which focuses on the equity fund sector both in US and EU during the financial market crisis, suggests that, irrespective of the bull or bear market momentum, it is difficult for an active manager to outperform the market given its combination of cost, security selection, and market-timing.

More recently, several studies focused on the outbreak of the COVID-19 pandemic in 1Q20.[6] Focusing on the US equity fund market during the COVID-19 crisis, Pastor and Vorsatz (2020) show that active funds underperformed their passive prospectus and market benchmarks. Their assumption is that, within an environment of extreme volatility and mispricing, the ability of active funds to outperform the market should clearly come to surface. Their findings, however, do not support this hypothesis. Similarly, ESMA's analysis focusing on the first wave of COVID-19 investigates UCITS fund performance against funds' prospectus benchmarks, distinguishing between active and passive funds (ESMA, 2022a). As Pastor and Vorsatz (2020), it does not find any clear outperformance of active funds net of ongoing costs, with respect to funds' benchmarks. However, this literature has not considered yet the fact that funds within the cohort of active funds are diverse, with some funds clearly outperforming. It is difficult, though, for an investor to identify those funds or fund strategies consistently outperforming.

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3 See Section on Data and methodology for more details.

4 See, for example, Morningstar 2021, Did Active Funds Finally Outperform in Temperamental 2020?

5 This is in also line with the views of Glode (2011) and Moskowitz (2000).

6 The first wave of COVID-19 was characterised by exceptional output contraction and increase in unemployment, unusually large price dislocations and soaring volatility in financial markets (Ramelli and Wagner, 2020; Baker et al., 2020). There is a substantial difference between pre- and post-pandemic analyses. The sudden flaring-up in stress levels characterising the outbreak of the COVID-19 has not been observed in previous crisis periods characterised by a gradual build-up of financial imbalances over time (Bernanke, 2020). The intensity of the stress prompted by the pandemic as well as its exogeneity create an ideal setting to cast some light on the dynamics of fund performance during turbulent times. Overall, the investment fund sector suffered from valuation uncertainty with significant outflows (Affinito Santioni, 2021; Falato et al., 2021) and, in some instances, heightened liquidity stress.

This analysis is a first attempt to shed some light on the performance heterogeneity within the cohort of active funds. We do this by focusing only on EU active equity funds, which are either classified by Morningstar as ESG or non-ESG, capturing the role of sustainable investing within the overall strategy of a fund, or that are provided with a Morningstar Sustainability Rating, designed to evaluate the relative ESG risks within portfolios. On the one hand, even if subject to significant caveats given the absence of EU-wide ESG fund label and the high diversity in terms of ESG strategies that can be implemented, the assessment of a fund regarding its sustainable characteristics can be used by an average investor (Hartzmark and Sussman, 2019). In addition, given the role that sustainable finance has been assuming recently, analysing the potential differences between ESG and non-ESG funds during a period marked by a sudden and exogenous shock such as the COVID-19 is of particular interest. Do ESG active funds outperform non-ESG ones during stress, confirming the trend observed over the longer time horizon (see ESMA, 2022c)? It seems that investors of ESG funds are less prone to react to negative past performance[7] but do they continue to invest in ESG products during market downturns?

A better understanding of sustainable investing is important to enhance risk assessment and risk management. Further evidence is key for investors to make informed investment decisions as well as to inform and complement the diverse policy and regulatory actions taken at the EU and national level. This is even more important given the role of the EU in encouraging a financial system that supports sustainable growth.[8] By re-orienting investments towards more sustainable technologies, sustainable finance could help ensuring that investments strengthen a sustainable and resilient economy.

In this paper, we show that ESG funds have higher performance and net inflows during a crisis period than non-ESG funds (Nofsiger and Varma, 2014; Pastor and Vorsatz, 2020). Funds with high sustainability ratings have also higher performance compared to funds with a low sustainability rating. But funds with a high sustainability rating are not always associated with high net inflows. This seems in line with the literature showing the influence of how information is reported on investing decisions. Investors seem to respond to simple and more straightforward information rather than excessively detailed information (Benartzi and Thaler, 1999; Hartzmark and Solomon, 2019).

The structure of the paper is as follows. Section 2 of the article provides details on the sample and methodology used. Sections 3 follows with the main findings and Section 4 provides some conclusions.

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7 ECB (2021), Financial Stability Review, May, Special feature B Climate-related risks to financial stability.

8 Finance and the Green Deal.

2 Data and methodology

2.1 Data and sample

This article is based on data retrieved from Morningstar Direct. The article focuses on equity active[9] UCITS domiciled in the EU that can be identified as ESG or not or that have an ESG rating (Morningstar Sustainability Rating).[10] The first measure, based on the prospectus or other regulatory findings, provides a general information on the role of sustainable investing within the overall investment strategy of a financial product.[11] The second is designed to support investors in evaluating the relative ESG risks within portfolios, and it is mainly based on the degree to which the economic value of the fund's holdings is at risk from ESG factors.[12] The financial product disclosure regime under the Sustainable Financial Disclosure Regulation (SFDR)[13] is out of the scope of this analysis since SFDR was not yet applicable during the period we analyse.

Data are either directly downloaded at fund level from Morningstar or aggregated from share class level data. The initial sample consists in an unbalanced panel of around 3,659 EU equity active funds in total. Following a necessary cleaning and excluding those funds for which data on funds' characteristics (including ESG features)[14] is not available, our sample consists of 2,581 funds domiciled in the EU27 going from 2,165 active equity UCITS in February 2020 to 2,519 in June 2020 and reaching a total of just above EUR 600bn in June 2020 from around EUR 536bn in February, just below 40% of the EU equity active UCITS market.[15] Among those 2,581 funds, 1,776 can be identified as either ESG or not and have also an ESG rating, 737 funds have only an ESG rating and 68 have only the Morningstar ESG flag.

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9 We rely on Morningstar "index funds" flag and define active funds as all funds which don't track an index. Funds in our sample can then have different levels of "activity".

10 For the rest of the analysis, we will distinguish funds with a high sustainability rating (which will be called high-rated funds) from funds with a low sustainability rating (which will be called low-rated funds).

11 Morningstar classifies the following strategies as ESG investment: ESG integration, ESG company engagement, impact investing and thematic investing. This definition excludes funds that only employ 'exclusions', which are identified via norm-based screening and the exclusion of specific activities/sectors. See Morningstar (2019), 'Morningstar sustainable attributes: Framework and definitions for 'sustainable investment' and 'employs exclusions' attributes. Those data were extracted before the methodological changes operated by Morningstar during the Summer of 2022 and before the reclassification of some ESG funds (for further details, please see Financial Times, 'Morningstar cuts 1,200 funds from 'sustainable' list', 10 February 2022).

12 Morningstar Sustainability Rating methodology, November 2021.

13 Regulation (EU) 2019/2088 of the European Parliament and of the Council of 27 November 2019 on sustainability-related disclosures in the financial services sector.

14 To be included in the final sample, funds must have either a sustainability classification (ESG or non-ESG) or a sustainability rating or both.

15 ESMA, April 2022, ESMA Annual Statistical Report on Performance and Costs of EU Retail Investment Products 2022

Table 1

Number of funds according to the ESG flag and sustainability rating

		Sustainability rating						
		1	2	3	4	5	NA	Total
ESG flag	Non-ESG	117	313	547	314	147	61	1,499
	ESG	2	24	87	132	93	7	345
	NA	63	143	261	197	73	0	737
	Total	182	480	895	643	313	68	2,581

Note: Number of funds according to the ESG flag and sustainability rating.
Sources: Morningstar Direct, ESMA.

345 funds (13% of the sample) are classified as ESG funds and 956 (37% of the sample) have a high sustainability rating (i.e., sustainability rating of 4 or 5). At the end of 2Q20, funds classified as ESG had an average size of around EUR 254mln whilst non-ESG funds were on average around EUR 250mln. Non-ESG funds can have a high or a low ESG rating. Almost 30% of ESG funds have received the highest ESG rating and only two ESG funds have been granted with the lowest ESG rating. It is clear from Table 1 that the sample of ESG funds and the sample of funds with a high sustainability rating do not perfectly overlap. [16] In a following step, we include information regarding the use of exclusions by the funds (assessed by Morningstar, Table 2).

Table 2

Number of funds employing exclusions

		Sustainability rating						
		1	2	3	4	5	NA	Total
ESG flag	Non-ESG	1	12	37	25	5	4	84
	ESG	0	2	4	6	2	1	15
	NA	0	0	0	0	1	0	1
	Total	1	14	41	31	8	5	100

Note: Number of funds employing exclusions according to the ESG flag and sustainability rating.
Sources: Morningstar Direct, ESMA.

100 funds are employing exclusions. Most of those funds are considered as non-ESG by Morningstar and have a rating of 3 or 4. All the ESG variables seem then to give different information and to capture different approaches, motivating our choice to include all aspects in the regression.

16 In addition, the ESG dummy variable and the sustainability rating are not necessarily correlated (the correlation between the ESG dummy variable and the number of globes is equal to 0.29).

2.2 Model

This analysis focuses on EU active equity UCITS, distinguishing funds based on different sustainable characteristics. This allows us to capture a source of heterogeneity within the cohort of active funds based on exogenous metrics provided by Morningstar.

We focus on the period between 19 February 2020 and 30 June 2020. During this period, EU equity markets went through a phase of extreme market decline and surge in volatility from mid-February until the end of March. They then recovered in April 2020, registering a historically high monthly performance, followed by further growth in May. Finally, they stabilised at these higher levels in the second half of May and June, when liquidity conditions improved, and volatility declined.[17] Against this background, we distinguish three sub-periods of approximately 6 weeks each:

- Stress: from 19 February 2020 to 31 March 2020
- Recovery: from 1 April 2020 to 19 May 2020
- Stabilisation: from 20 May 2020 to 30 June 2020

We first provide an initial analysis focusing on identifying the development of active ESG and non-ESG fund returns and those of high- and low-rated ESG funds (Chart 1, Chart 2) and we then assess the comparative net performance of funds according to various ESG characteristics. In line with previous research, we first focus on the relation between fund net returns and ESG characteristics also accounting for relevant characteristics that may influence the results as follows:

$$
\begin{aligned}
&Net\ compound\ return_{i,t} \\
&\quad = \alpha + \beta_1\, ESG_i + \beta_2\, Log(Net\ assets)_{i,t} \\
&\quad + \beta_3\, Morningstar\ performance\ rating_i + \sum_{j=1}^{10} \beta_{(j+3)}\, Sectoral\ exposure_{j,i,t} \\
&\quad + \beta_{14}\, Costs_{i,t} + \beta_{15}\, Age_{i,t} + \beta_{16}\, Morningstar\ category_i + \varepsilon_{i,t}
\end{aligned}
$$

The dependent variable is the net compound return calculated from the net daily returns.[18]

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17 ESMA, 2021, TRV No.2 2020.

18 Net compound return is computed as follows: Net compound return$_{i,t}$ = Net compound return$_{i,t-1}$ * (1 + Net return$_{i,t}$) with Net compound return = 100 the first day of the relevant period

The ESG_i will represent different ESG characteristics. ESG_i is the main variable of interest of our model. So far, there is not a widely accepted definition or EU-harmonised label for ESG funds. We, therefore, test several variables identifying various aspects of ESG to ensure the robustness of the results.

First, ESG_i can be a dummy variable taking the value of 1 if a fund is considered as an ESG fund by Morningstar at the end of 2019. Morningstar classifies the following strategies as ESG investment: ESG integration, ESG company engagement, impact investing and thematic investing. This definition excludes funds that only employ 'exclusions', which are identified via norm-based screening and the exclusion of specific activities/sectors.[19] That is why, in a second step, we distinguish funds that were employing exclusions and funds that did not, as at the end of 2019. We also introduce ESG ratings by incorporating two additional variables. The first one compares the funds with a high Morningstar Sustainability Rating to the funds with a low Morningstar Sustainability Rating at the end of 2019. Morningstar sustainability rating measures the risks stemming from ESG factors at the portfolio level. The fund rating is calculated as a weighted average of underlying issuers' ESG rating (for both corporates and sovereigns) based on Sustainalytics assessment. Funds are rated from one to five globes, funds with a high ESG risk relative to similar funds are rated with one globe, whereas funds that receive five globes have low ESG risks compared to similar funds. For the purpose of this analysis, high-rated funds are funds with a rating of 4 or 5 whereas low-rated funds are funds with a rating of 1 or 2. Finally, we interact the ESG dummy with the sustainability rating to test whether being identified as ESG and granted with a high sustainability rating add an additional effect.

Our set of control variables includes[20]:

- The size of the fund, Log (Net assets)$_{(i,t)}$, measured as the logarithm of the fund's net asset.

- The performance rating at the end of 2019 (*Morningstar performance rating*$_i$), which reflects the fund's risk adjusted return relative to similar funds at the end of 2019.[21] Funds are divided into five categories, going from the worst performers to the best performers.

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19 We recall here that the data were extracted before the methodological changes operated by Morningstar during the Summer of 2022. We then still rely on the older definition and methodology.

20 In an alternative specification, a dummy variable distinguishing funds predominantly composed of retail share classes from funds mostly composed of institutional share classes was introduced. However, the coefficient associated with this variable is in most cases non-significant and this alternative model yields similar results.

21 According to Morningstar: "The Morningstar Rating for funds, commonly called the star rating, is a measure of a fund's risk-adjusted return, relative to similar funds. Funds are rated from one to five stars, with the best performers receiving five stars and the worst performers receiving a single star".

We will assess the difference of net compound return between each category of funds (except the worst performers) and the worst performers.

- The fund's monthly long exposures to ten broad sectors. The sectoral exposures are measured as the share of the fund's portfolio invested in each sector.[22]

- Costs of the fund as lower costs could lead to greater net returns and larger inflows. We use the monthly total expense ratio (TER) retrieved from Lipper.

- The age of the fund (i.e., the difference between the actual date and fund's launch date) is also included, as this is a key characteristic of ESG funds: they are, on average, younger.

Finally, we consider the classification of each fund's strategy at the end of 2019 (i.e., 'Morningstar Category'). The standard errors are clustered on the Morningstar Category.[23]

Previous research (Pastor and Vorsatz, 2020; Ferriani and Natoli, 2021) identifies a relation between flows and ESG characteristics, namely higher rated sustainable funds seem to receive larger flows compared to lower rated sustainable funds. Going along these lines we analyse the relation between cumulative fund flows (as a percentage of the previous day net assets), our fund sustainability measures and a series of controls, accounting for fund characteristics in line with previous research:

$$\frac{Cumulative\ net\ flows_{i,t}}{Net\ assets_{i,t-1}} = \alpha + \beta_1\, ESG_i + \beta_2\, Log(Net\ assets)_{i,t} + \beta_3\, Morningstar\ performance\ rating_i + \sum_{j=1}^{10} \beta_{(j+3)}\, Sectoral\ exposure_{j,i,t} + \beta_{14}\, Costs_{i,t} + \beta_{15}\, Age_{i,t} + \beta_{16}\, Morningstar\ category_i + \beta_{17}\, 2019\ Return_i + \varepsilon_{i,t}$$

For this second regression, our dependent variable is the cumulative net flows (calculated as the cumulated sum of daily net flows over the period considered) as a percentage of the net

[22] The sectoral exposures are split between eleven sectors: basic materials, communication, consumer cyclical, consumer defensive, energy, financials, health care, industrials, real estate, technology, and utilities. To avoid collinearity issues the exposure to the real estate sector is not included in the regressions. We consider the long exposure. In consequence, the exposure can be greater than 100%.

[23] While the dependent variable is at daily frequencies (e.g., returns), others are at lower frequencies (e.g., costs, sector exposure). In an alternative specification we double check the reported results by performing an analysis removing the asynchronicity among the variables used.

assets the day before the beginning of the period considered.[24] The independent variables are the same compared with previous regression, except for the inclusion of an additional control variable which is the fund performance in 2019.

Regarding the control variables, they are summarised in Table 3 below. Tables 7 and 8 in the annex present the same descriptive statistics but distinguishing ESG funds from non-ESG funds.[25] The comparison shows that funds classified as ESG by Morningstar have on average a greater sustainability rating, a higher exposure to the industrial and utility sectors and a lower exposure to the financial and energy sectors. In addition, ESG funds are on average younger and less expensive.

Table 3

Descriptive statistics for fund characteristics

	Obs.	Mean	St. Dev	Min	Max
Net assets	191,760	18.0	1.9	4.8	23.1
Morningstar rating	191,760	2.9	1.1	1.0	5.0
Basic materials	191,760	5.7	7.5	0.0	99.8
Communication	191,760	8.0	6.1	0.0	94.2
Consumer cyclical	191,760	10.3	6.6	0.0	92.0
Consumer defensive	191,760	7.9	6.8	0.0	97.6
Financials	191,760	13.0	9.5	0.0	99.7
Healthcare	191,760	13.7	13.8	0.0	192.6
Industrials	191,760	12.7	9.0	0.0	73.2
Technology	191,760	15.0	10.8	0.0	89.5
Utilities	191,760	3.2	4.6	0.0	60.9
Energy	191,760	3.3	6.5	0.0	99.0
Costs	191,760	1.3	0.5	0.0	4.7
Age	191,760	6.2	3.0	0.0	26.0
Return 2019	191,584	26.2%	0.1	-1.7%	60.8%

Note: Net assets is the logarithm of net asset value; Morningstar rating represents the fund's risk adjusted return relative to similar funds at the end of 2019; Basic materials, Communication, Consumer cyclical, Consumer defensive, Financials, Healthcare, Industrials, Technology, Utilities, Energy represent the business sector the funds are exposed to; Costs is the fund's total expense ratio (TER); Age is the difference between the actual date and fund's launch date; Returns 2019 is fund's net return in 2019.
Sources: Morningstar Direct, Refinitiv Lipper, ESMA.

Table 4 also shows the pairwise correlations between each dependent variable. Overall, the correlation appears limited ranging between -0.34 (between the exposure to the communication sector and the exposure to the industrials sector) and 0.41 (between the return in 2019 and the Morningstar performance rating).

[24] For instance, when analysing the whole period (from 19 February to 30 June) we divide for each day the cumulative sum of daily net flows starting on 19 February by the 18 February net assets.

[25] Please note that the sum of observations from tables 7 and 8 is not equal to the number of observations reported in Table 3 as some funds are not classified as ESG or non-ESG funds. Those funds have however a sustainability rating and are then kept in the sample.

Table 4

Correlation between the independent variables

	ESG	Sust Rating	Net assets	Morning Rating	Basic materials	Comm	Consum Cyclical	Energy	Consum Defens	Financ	Healthc	Indus	Tech	Utilities	Costs	Age	Return 2019
ESG	1																
Sust Rating	0.28*	1															
Net assets	0.03*	0.09*	1														
Morning Rating	0.14*	0.19*	0.06*	1													
Basic materials	0	-0.15*	-0.08*	-0.04*	1												
Comm	-0.11*	0.07*	0.06*	0.02*	-0.19*	1											
Consum Cyclical	-0.08*	0.07*	-0	0.04*	-0.14*	0.18*	1										
Energy	-0.10*	-0.21*	-0.09*	-0.16*	0.20*	-0.07*	-0.13*	1									
Consum Defens	0.05*	0.10*	0.04*	-0.07*	-0.05*	-0.01*	0	-0.06*	1								
Financ	-0.08*	-0.05*	0.01*	-0.07*	-0.08*	0.08*	-0.03*	0.05*	-0.02*	1							
Healthc	0.01*	0.02*	0.06*	0.09*	-0.17*	-0.24*	-0.27*	-0.2*	-0.04*	-0.27*	1						
Indus	0.18*	-0.06*	-0.05*	-0.04*	0.05*	-0.33*	-0.02*	-0.12*	-0.12*	-0.24*	-0.15*	1					
Tech	-0.01*	0.16*	0.12*	0.22*	-0.26*	0.19*	0.09*	-0.25*	-0.22*	-0.18*	-0.14*	-0.1*	1				
Utilities	0.18*	-0.06*	-0.04*	-0.07*	0	-0.08*	-0.16*	0.05*	-0.05*	-0.02*	-0.13*	0.2*	-0.22*	1			
Costs	-0.12*	-0.11*	-0.17*	-0.18*	0.03*	-0.06*	0.02*	0.05*	-0.06*	-0.08*	0.01*	0.01*	0.01*	-0.019*	1		
Age	-0.11*	-0.01*	0.12*	-0.09*	0.02*	0	0	0.04*	0.04*	0.07*	-0.05*	-0.04*	-0.01*	-0.04*	0.10*	1	
Return 2019	0.08*	0.21*	0.16*	0.41*	-0.09*	-0.02*	-0.02*	-0.24*	-0.13*	-0.06*	0.12*	0	0.34*	-0.14*	-0.13*	-0.01*	1

Note: Net assets is the logarithm of net asset value; Morningstar rating represents the fund's risk adjusted return relative to similar funds at the end of 2019; Basic materials, Communication, Consumer cyclical, Consumer defensive, Financials, Healthcare, Industrials, Technology, Utilities, Energy represent the business sector the funds are exposed to; Costs is the fund's total expense ratio (TER); Age is the difference between the actual date and fund's launch date; Returns 2019 is fund's net return in 2019. The star indicates that the correlation is significant at least at the 5% level.
Sources: Morningstar Direct, Refinitiv Lipper, ESMA.

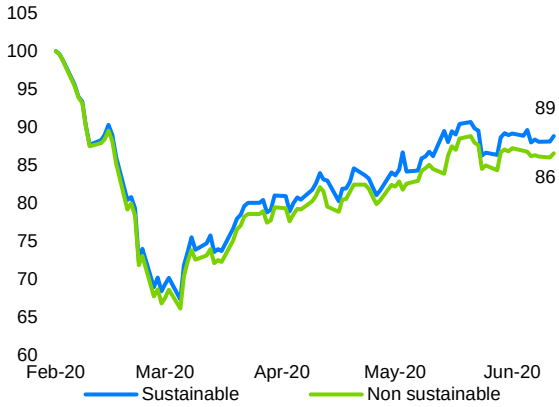
We initially analyse the fund's compound net returns. Overall, funds' performance mirrors the sudden and severe drop in valuations across asset classes that characterised 1Q20, namely the second part of the quarter when COVID-19 first hit followed by full lockdowns across the EU.[26] We can observe a steep fall in net returns irrespective of funds being ESG or not. Between 19 February and the last week of March, returns fell by almost 30% on average across our sample. However, the compound total return index is slightly higher for ESG compared to non-ESG active funds (Chart 1). Charts 5 and 6 from the annex show that the median and 90th percentile of the total return indexes of ESG and non-ESG are broadly similar, but the 10th percentile diverge more substantially and is higher in case of ESG funds (82 vs 77). What is interesting, also, is to observe the dynamics between funds with a high ESG rating score (i.e., sustainability rating of 4 or 5) and those with a lower one (i.e., sustainability rating of 1 or 2, Chart 2). When we look at the sustainability rating of active equity UCITS we can see a clearer wedge between highly and low rated ESG funds.

Also, in terms of net flows we can observe significant aggregate fund outflows, especially in the six weeks before the end of March. Notable differences exist between ESG and non-ESG funds. While non-ESG funds experienced cumulative net outflows between 19 February and 30 June, ESG funds received significant inflows (Chart 3), especially from April 2020. A clear distinction can also be made between funds with a high sustainability rating and funds with a low sustainability rating (Chart 4). Between 19 February and 30 June, funds with higher sustainability ratings received inflows approximately equivalent to 2% of their 18 February net assets compared to outflows of almost 6% for funds with the lowest sustainability rating.

[26] For the rest of the year 2020, financial market valuations remained sustained, not reflecting underlying macroeconomic and COVID-related uncertainty. Please see ESMA TRV No.1 2021.

Chart 1

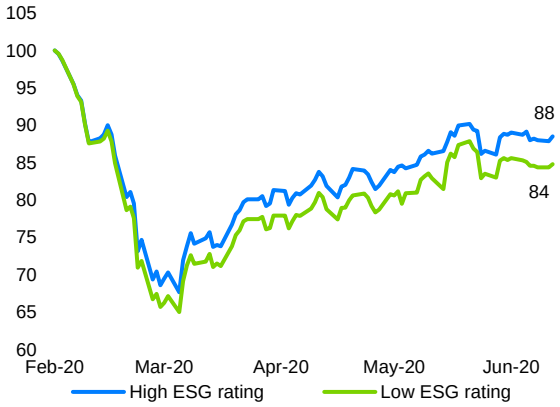
Total net return index – ESG and non-ESG



Note: EU 27 equity active UCITS, average daily total return index, sustainable and non sustainable funds. 19 February 2020 = 100. Figures report the last observation for each index.
Sources: Morningstar Direct, ESMA.

Chart 2

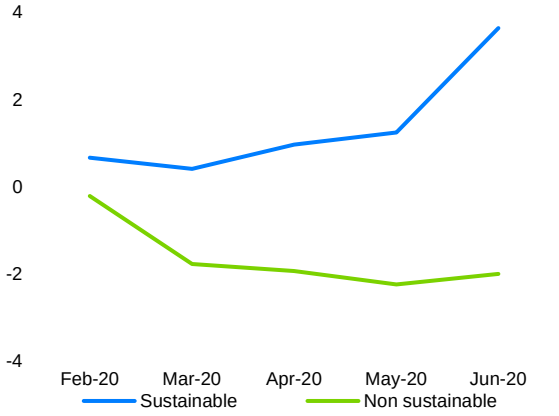
Total net return index – high and low ESG rating



Note: EU 27 equity active UCITS, average daily total return index by fund sustainability rating. 19 February 2020 = 100. Figures report the last observation for each index.
Sources: Morningstar Direct, ESMA.

Chart 3

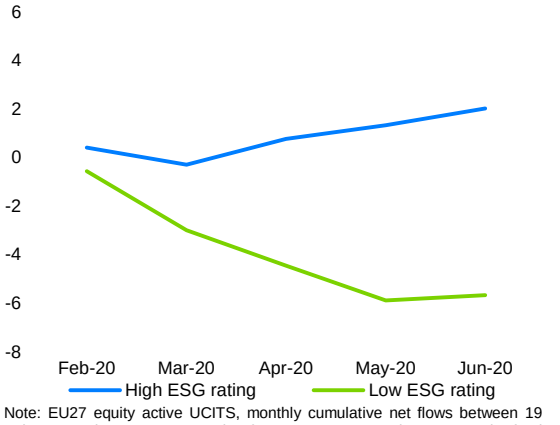
Monthly cumulated net flows – ESG and non-ESG



Note: EU27 equity active UCITS, monthly cumulative net flows between 19 February and 30 June as a ratio of net assets at 18 February 2022 for sustainable and non sustainable funds.
Sources: Morningstar Direct, Refinitiv Lipper, ESMA.

Chart 4

Monthly cumulated net flows – high and low ESG rating



Note: EU27 equity active UCITS, monthly cumulative net flows between 19 February and 30 June as a ratio of net assets at 18 February 2022 by fund sustainability rating.
Sources: Morningstar Direct, Refinitiv Lipper, ESMA.

The aim for the next section is to provide statistical evidence for the stylised facts presented above.

3 Results

3.1 ESG funds are associated with higher net returns

First, we analyse the relation between net returns, our dependent variable, and ESG funds, identified by a dummy variable equal to 1 if a fund is classified as ESG by Morningstar. The results are presented in *Panel a* (columns 1 and 5), and *Panel b* (columns 1 and 5) of Table 5. They show that if funds are classified as ESG, compound net returns are higher over the whole period. All else being equal, ESG funds outperformed non-ESG funds by 0.5 basis points (*Panel a (1)*). The main driver of this outperformance of ESG funds is their higher performance during the stress period (*Panel a (5)*). During the recovery and stabilisation periods (Panel b (1) and (5)), the returns of ESG and non-ESG funds are not statistically different.

When we split the sample between funds employing exclusions and funds that do not (without imposing any requirement regarding the other ESG dimensions), we observe that there is no significant difference in returns between funds that employ exclusions and funds that do not whatever the period considered (*Panel a and b,* (2) and (6)). This result is aligned with findings from Pastor and Vorsatz (2020) who demonstrated an absence of significant correlation between the exclusions and fund's performance during the COVID-19 crisis.

When we focus on the difference between funds with high or low sustainability ratings (without taking into account if the fund is ESG or not),[27] results show that funds with a high sustainability rating outperformed funds with a low sustainability rating over the whole period (*Panel a* (3)). This is even stronger when focusing on the crisis period (*Panel a* (7)). However, during the recovery and the stabilisation periods, funds with a high sustainability rating underperformed funds with a low sustainability rating (*Panel b* (3), (7)). All else being equal, funds with a low sustainability rating outperformed funds with a high sustainability rating by 0.4 basis points. These results are broadly aligned with Pastor and Vorsatz (2020), who concluded that benchmark-adjusted returns of US funds are higher for funds with more globes between 20 February and 30 April (corresponding then to our stress period and around half of our recovery period). The results also relate to Nofsinger and Varma (2014), even if having a different focus and using a sample of socially responsible investing (SRI) mutual funds, show that, in non-crisis periods, conventional funds outperform SRI funds, but the opposite is observed in crisis periods.

[27] In our sample, the share of ESG funds reporting a low sustainability rating is very low. See footnote 9.

Table 5

Regression results with compound net returns as dependent variable

(*Panel a*)

	Whole period				Stress period			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ESG	0.005***			0.001	0.007***			0.013***
	(0.002)			(0.005)	(0.002)			(0.004)
Empl excl		0.003				0.010		
		(0.004)				(0.006)		
High-rated			0.005**	0.007**			0.009***	0.010***
			(0.002)	(0.003)			(0.002)	(0.002)
ESG high-rated				0.001				-0.008
				(0.006)				(0.005)
Size	0.003***	0.007***	0.003***	0.003***	0.006***	0.011***	0.006***	0.006***
	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.003)	(0.001)	(0.001)
Star rating =5	0.048***	0.030***	0.048***	0.045***	0.032***	0.010	0.029***	0.027***
	(0.007)	(0.008)	(0.007)	(0.008)	(0.007)	(0.011)	(0.007)	(0.008)
Costs	0.007***	0.010	0.007***	0.0060***	0.010***	0.012*	0.009***	0.009***
	(0.002)	(0.007)	(0.002)	(0.002)	(0.002)	(0.006)	(0.002)	(0.003)
Age	-0.000	-0.000	0.000	0.000	-0.001***	-0.002	-0.001***	-0.001**
	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)
Sectors	Significant sectors: Energy, Consumer Defensive, Financial, Healthcare				Significant sectors: Materials, Financial, Industria, Technology			
Constant	-0.243***	-0.328***	-0.229***	-0.217***	-0.325***	-0.412***	-0.284***	-0.285***
	(0.019)	(0.041)	(0.025)	(0.025)	(0.021)	(0.067)	(0.026)	(0.032)
Obs	137,464	15,318	118,657	85,387	46,615	5,158	40,445	29,106
R^2	0.21	0.30	0.22	0.20	0.06	0.10	0.06	0.06

(*Panel b*)

	Recovery				Stabilisation			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ESG	-0.001			-0.003	0.000			0.005
	(0.001)			(0.005)	(0.001)			(0.003)
Empl excl		0.002				0.001		
		(0.004)				(0.003)		
High-rated			-0.004**	-0.003			-0.004***	-0.004***
			(0.002)	(0.003)			(0.001)	(0.001)
ESG high-rated				0.002				-0.004
				(0.005)				(0.003)
Size	0.001***	0.002*	0.001***	0.001*	-0.000	0.000	0.000	0.000
	(0.000)	(0.001)	(0.00))	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)
Star rating =5	0.012***	0.023***	0.015***	0.015***	-0.002	-0.011*	-0.002	-0.001
	(0.003)	(0.005)	(0.003)	(0.003)	(0.003)	(0.005)	(0.003)	(0.003)
Costs	-0.001	0.007*	-0.001	-0.002	-0.000	-0.004	0.000	0.000
	(0.001)	(0.004)	(0.000)	(0.002)	(0.001)	(0.004)	(0.001)	(0.001)
Age	0.000	-0.001*	-0.00)	-0.000	0.000	0.001	0.000	0.000
	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Sectors	Significant: Materials, Comm, Consumer cycl., Energy, Healthcare, Technology				Significant: Consumer cycl., Financial, Healthcare, Industrial			
Constant	0.003	0.048*	0.005	-0.001	-0.013	-0.017	-0.017*	-0.021**
	(0.011)	(0.028)	(0.020)	(0.024)	(0.009)	(0.024)	(0.010)	(0.010)
Obs	47,367	5,355	40,511	29,327	43,482	4,805	37,701	26,954
R^2	0.28	0.33	0.29	0.29	0.37	0.46	0.35	0.36

Note: ESG is a dummy equals to 1 if a fund is classified as ESG; Empl excl is a dummy equals to 1 if a fund employs exclusions; High-rated is a dummy equals to 1 if a fund is granted with 5 globes and equals to 0 if a fund is categorised as having 1 globe; ESG high-rated includes both the effect of being ESG and being granted with 4 or 5 globes and the interactions between the two; Size is the logarithm of net asset value; Star rating=5 represents the fund's risk adjusted return relative to similar funds at the end of 2019; Costs is the fund's TER; Age is the difference between the actual date and fund's launch date. Sectors report the sectors that show the highest correlation with performance.
The Morningstar category variables, the sectoral exposures, and the performance ratings lower than five are hidden from the results. The standard errors are clustered on the Morningstar Category. Significance levels are reported as follows: (0.01 (***), 0.05 (**), 0.1(*)).
Sources: Morningstar Direct, Refinitiv Lipper, ESMA.

Differently from previous analyses concluding that funds with the highest sustainability rating continuously outperformed funds with the lowest sustainability rating around the surge of the COVID-19 crisis (Ferriani and Natoli (2020)), in our study, the coefficient associated with a high sustainability rating is not always positive. The same trend cannot be observed for ESG: either ESG funds outperformed, or the coefficient is not statistically significant. However, not all ESG strategies led to outperformance as funds employing exclusions barely outperformed funds that do not. This result seems to indicate that the implementation of an ESG strategy and the sustainability ratings capture different dimensions. While one dimension is based on portfolio holdings (i.e., the sustainability rating), the other take into account the intentions of the fund (i.e., the ESG flag). The results suggest that these two dimensions identify different types of funds. This requires further in-depth analysis of the portfolio holdings of these two types of funds, also in order to better understand their relative performances.

The last regressions (*Panel a and b,* (4) and (8)) show that being an ESG funds with a high sustainability rating is not associated with an additional outperformance or underperformance compared to ESG funds or funds with a high sustainability rating. Whatever the period considered, the coefficient associated with the interaction is always non-significant. In table 9 of the annex, the variables identifying ESG funds and high-rated funds are interacted in a way to create 4 distinct groups: non-ESG low-rated funds, non-ESG high-rated funds, ESG low-rated funds and ESG high-rated funds. The results show that compared to non-ESG low-rated funds, non-ESG high-rated funds and ESG low-rated funds outperformed during the crisis period.

Focusing on the additional control related to fund characteristics and economic sector, fund size is positively correlated with returns in line with ESMA previous analysis (ESMA, 2022c). This differs from findings of previous academic literature (i.e., Chen, Hong, Huang, and Kubik (2004) or Yan (2008)). This could probably be related to the specificity of the sample and the stress period considered in this paper compared to ‘normal times’. Moreover, focusing on the Star rating, ranking the risk-adjusted performance of a funds, we can observe that funds with the highest performance rating either significantly outperform funds with the lowest performance rating or had similar returns. This result is aligned with findings from Pastor and Vorsatz (2020) who concluded that funds with higher star ratings performed better. As expected, fund costs are negatively correlated with the net returns. Finally, we also distinguish by the economic sector in which the fund portfolio is concentrated, in order to take into account the possible impact that the industry exposure can have on performance. Looking at the overall period, performance is significantly correlated to the Financial, Healthcare, Consumer, Energy, Industrials, Basic Materials and Technology sectors. However, the role that these industries have across the different sub-periods changes as could be expected. In particular, during the stress period, the Basic Materials, Technological, Financial and Industrial sectors are those

most significantly correlated to performance. Conversely, during the recovery period the industries that are mostly relevant are Healthcare, Technology and Communication.[28]

As a robustness check, we removed the asynchronicity among the variables by keeping the final value of the cumulative returns rather than the time series. The regressions results show that having a high sustainable rating is still associated with higher returns during the stress period but lower returns during the recovery. Contrary to Table 5, being an ESG funds is not correlated with higher returns during the crisis period but rather during the stabilisation period (the significance level is however 10%). Also being an ESG funds is associated with lower returns during the recovery period (the significance level remains low).

3.2 Higher net flows for ESG funds with the highest ESG ratings

We then analyse the drivers of funds' flows. Our dependent variable is the cumulative net flows (as percentage of net assets the day before the beginning of the period considered), the control variables remain the same as previously except for the inclusion of 2019 return.[29]

Similarly, to the previous analysis focusing on returns, we regress net flows on the dummy variable that identifies ESG funds. The results are in *Panel a* (1, 5) and *Panel b* (1, 5) of Table 6. The results show that being an ESG funds was associated with higher net flows over the whole period (column (1) *of Panel a*). When distinguishing the three sub-periods, we observe that ESG funds received higher net flows during the stress and the stabilisation periods (columns (5) of *panel a* and *b*). This is not observed during the recovery period (column (1) of *panel b*). This result confirms previous findings that investors favoured ESG funds during the peak of COVID-19 crisis.

[28] Additional details can be provided on demand.

[29] It is likely that best performers would attract more investors, making necessary to control for this factor. Besides, in the peak of the COVID crisis, an investor looking to compare investment funds could have access easily to the 2019 return (through KIIDs for instance).

Table 6

Regression results with cumulative flows as dependent variable

(*Panel a*)

	Whole period				Stress period			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ESG	0.029***			0.060**	0.023***			0.026***
	(0.008)			(0.029)	(0.007)			(0.008)
Empl excl		-0.006				-0.011		
		(0.019)				(0.012)		
High-rated			0.011	0.016			0.008*	0.007
			(0.008)	(0.010)			(0.005)	(0.006)
ESG high-rated				-0.043				-0.011
				(0.033)				(0.011)
Size	0.010***	0.010	0.014***	0.013***	0.005**	0.003	0.008***	0.008**
	(0.003)	(0.009)	(0.003)	(0.004)	(0.002)	(0.004)	(0.003)	(0.003)
Star rating =5	0.071***	0.084**	0.065***	0.070**	0.038**	0.049**	0.035**	0.041**
	(0.021)	(0.031)	(0.022)	(0.027)	(0.015)	(0.021)	(0.014)	(0.019)
Costs	0.019**	0.039*	0.024**	0.024*	0.007	0.032***	0.009	0.013
	(0.009)	(0.023)	(0.010)	(0.013)	(0.007)	(0.010)	(0.007)	(0.009)
Age	-0.005***	-0.006**	-0.006***	-0.006***	-0.002**	-0.003**	-0.003***	-0.004***
	(0.001)	(0.003)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.001)
2019 return	0.213***	-0.133	0.281***	0.278***	0.103***	-0.053	0.128***	0.120**
	(0.055)	(0.194)	(0.075)	(0.085)	(0.032)	(0.090)	(0.047)	(0.051)
Constant	-0.201***	-0.451***	-0.295***	-0.300**	-0.131**	-0.060	-0.179**	-0.221**
	(0.075)	(0.151)	(0.107)	(0.123)	(0.056)	(0.078)	(0.073)	(0.089)
Obs	134,895	15,078	116,621	84,052	46,296	5,091	39,868	28,709
R^2	0.12	0.33	0.13	0.15	0.09	0.24	0.10	0.12

(*Panel b*)

	Recovery				Stabilisation			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ESG	0.003			0.007	0.010**			0.010
	(0.006)			(0.008)	(0.005)			(0.014)
Empl excl		0.008				0.006		
		(0.015)				(0.011)		
High-rated			-0.001	0.003			0.007**	0.006
			(0.006)	(0.009)			(0.003)	(0.004)
ESG high-rated				-0.008				-0.006
				(0.013)				(0.015)
Size	0.005**	0.006	0.004*	0.005*	0.003**	0.015**	0.001	0.002
	(0.002)	(0.004)	(0.002)	(0.003)	(0.001)	(0.007)	(0.001)	(0.002)
Star rating =5	0.016	0.018	0.005	0.005	0.028***	0.023	0.016**	0.029***
	(0.010)	(0.024)	(0.011)	(0.013)	(0.007)	(0.022)	(0.007)	(0.009)
Costs	0.015***	0.010	0.012***	0.012**	0.011***	0.015	0.009**	0.012***
	(0.005)	(0.016)	(0.004)	(0.005)	(0.003)	(0.013)	(0.004)	(0.004)
Age	-0.001***	-0.004**	-0.001**	-0.001	-0.001	-0.003	-0.000	0.000
	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.003)	(0.001)	(0.001)
2019 return	0.047	-0.068	0.109***	0.061	0.042	0.204	0.116***	0.077*
	(0.031)	(0.099)	(0.034)	(0.038)	(0.028)	(0.156)	(0.034)	(0.040)
Constant	-0.072	-0.431***	-0.060	-0.040	-0.020	-0.291	0.016	0.010
	(0.054)	(0.073)	(0.059)	(0.068)	(0.025)	(0.201)	(0.040)	(0.050)
Obs	46,216	5,173	39,580	28,749	42,269	4,707	36,828	26,252
R^2	0.12	0.29	0.13	0.15	0.09	0.32	0.11	0.12

Note: Funds flows higher than the 99th percentile have been removed from the sample. ESG is a dummy equals to 1 if a fund is classified as ESG; Empl excl is a dummy equals to 1 if a fund employs exclusions; High-rated is a dummy equals to 1 if a fund is granted with 4 or 5 globes and equals to 0 if a fund is categorised as having 1 or 2 globes; ESG high-rated includes both the effect of being ESG and being granted with 4 or 5 globes and the interactions between the two; Size is the logarithm of net asset value; Star rating=5 represents the fund's risk adjusted return relative to similar funds at the end of 2019; Costs is the fund's TER; Age is the difference between the actual date and fund's launch date; 2019 returns is fund's net return in 2019.
The Morningstar category variables, the sectoral exposures, and the performance ratings lower than five are hidden from the results. The standard errors are clustered on the Morningstar Category. Significance levels are reported as follows: (0.01 (***), 0.05 (**), 0.1(*)).
Sources: Morningstar, Lipper, ESMA.

Regressions show some signs that investors prefer funds with high sustainability ratings during the crisis (*Panel a* (7)) and the stabilisation periods (*Panel b* (7)). However, this result is less significant compared with Pastor and Vorsatz (2020) and Ferriani and Natoli (2020). Especially, Ferriani and Natoli (2020) concluded that five-globes funds attracted higher inflows during all sub-periods considered ('Pre crash', 'Crash' and 'Recovery') whereas our results show no significant difference of flows between high and low rated funds during the recovery (*Panel b* (3)) and low significant difference during the crisis period (*Panel a* (7)). Being granted with a high sustainability rating, in addition to being an ESG fund is not correlated with more or less flows (*Panel a and b,* (4) and (8)). Table 9 of the annex shows that ESG low-rated funds received significantly more inflows compared to non-ESG low-rated funds. However, the difference of net flows between non-ESG high-rated funds and non-ESG low-rated funds is not statistically significant.

The net flows were positively correlated to the funds' size and the past return. As in Pastor and Vorsatz (2020), five stars funds were associated to higher net flows. Surprisingly, when the coefficient associated to costs was significant, it was positive. This might imply that fund's costs were not the main focus of investors during the COVID-19 crisis, but they rather paid attention to the past performances and the ESG characteristics during a period of stress when the marginal utility from hedging losses is higher than normal period.

The robustness checks run by removing the asynchronicity between the variables show similar results that the ones exhibited in Table 6. ESG funds are associated with higher net flows during all periods except the recovery and funds with a high sustainability rating are associated with higher net flows during the stabilisation period.

4 Conclusion

In this paper we analyse the performance and flows of EU ESG active equity UCITS during the peak of the COVID-19 crisis (i.e., from 19 February 2020 to end of June 2020). Compared to other crisis events in the recent past, such as the energy crisis starting in February 2022, analysing this specific event has the advantage of looking at an exogenous shock external to the financial market and affecting the market as a whole. We provide some additional pieces of evidence aimed at a better understanding of sustainable finance in the EU with a focus on the stressed period following the COVID-19 outbreak.

First, we find that ESG active funds tended to perform better than non-ESG active funds. In this way, we contribute to the debate regarding the need to account for heterogeneity in performance within the cohort of active funds. We find that ESG active UCITS outperform non-ESG active UCITS during the ten weeks of the first COVID-19 outbreak. Funds with a high ESG rating also reported over the whole period higher returns compared to funds with a low

ESG rating. However, being an ESG funds and being granted with a high sustainability rating is not associated with a surplus of performance.

Second, we report on the positive role of sustainable attributes on the investment fund flows during the COVID-19 crisis, potentially suggesting that investors perceive sustainability as providing hedge in troubled times (Ferriani and Natoli, 2020; Pastor and Vorsatz 2020). We demonstrate that sustainable characteristics matter for investors even in a period of crisis as ESG funds and funds granted with a high sustainability rating by Morningstar are associated with higher net flows (even if the evidence is weaker in the latter case). However, not all ESG strategies are correlated with higher inflows as there is no statistically significant difference of net flows between funds employing exclusions and funds without exclusions.

Finally, this paper tries to shed light on the outcome of making sustainable investment choices when taking investment decisions, as well as on the sources influencing active funds' performance – a relevant question given that 75% of the equity fund investments in the EU are still focused on actively managed funds. We implemented several methods to distinguish ESG and non-ESG funds, which sometimes led to different results. Further investigation is warranted, aiming at more robust results and at a more in-depth analysis of the drivers behind investor choices and observed outcomes. This also includes a more in-depth analysis at fund risk exposure that is not fully accounted for in the current analysis while being a relevant factor in explaining performance dynamics. Further analysis can also go in the direction of analysing the level of "activism" and governance of a fund. A larger and more comprehensive set of data is needed and could be available over time especially given the improvements in definitions and the regulatory efforts undertaken following the growth in demand for sustainable products across asset classes.

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Appendix: Additional tables and graphs

Table 7

Descriptive statistics for ESG funds' characteristics

	Obs.	Mean	St. Dev	Min	Max
Net assets	24,531	18.2	1.7	11.8	22.4
Morningstar rating	24,531	3.3	1.1	1.0	5.0
Basic materials	24,531	5.9	4.4	0.0	43.6
Communication	24,531	6.4	5.2	0.0	30.4
Consumer cyclical	24,531	9.2	5.0	0.0	40.6
Consumer defensive	24,531	8.6	6.4	0.0	40.2
Financials	24,531	10.9	8.8	0.0	97.3
Healthcare	24,531	14.0	8.6	0.0	94.7
Industrials	24,531	16.6	12.0	0.0	73.2
Technology	24,531	15.0	8.6	0.0	60.4
Utilities	24,531	5.0	6.7	0.0	60.9
Energy	24,531	1.8	2.5	0.0	22.4
Costs	24,531	1.2	0.5	0.2	4.4
Age	24,531	5.7	3.1	0.1	19.3
Return 2019	24,531	27.5%	0.1	5.9%	44.0%

Note: Net assets is the logarithm of net asset value; Morningstar rating represents the fund's risk adjusted return relative to similar funds at the end of 2019 ; Basic materials, Communication, Consumer cyclical, Consumer defensive, Financials, Healthcare, Industrials, Technology, Utilities, Energy represents the business sector the funds are exposed to; Costs is the fund's TER; Age is the difference between the actual date and fund's launch date ; returns 2019 is fund's net return in 2019.
Sources: Morningstar Direct, Refinitiv Lipper, ESMA.

Table 8

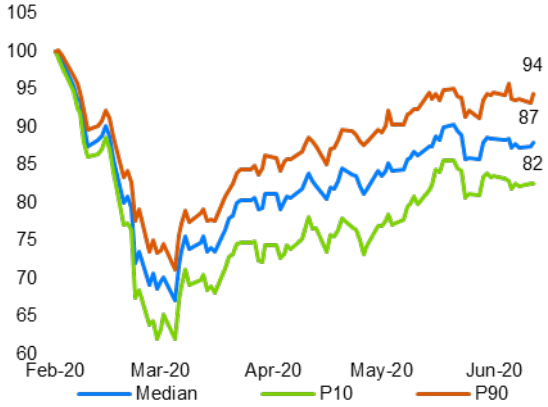
Descriptive statistics for non-ESG funds' characteristics

	Obs.	Mean	St. Dev	Min	Max
Net assets	114,371	18.0	1.9	6.8	23.1
Morningstar rating	114,371	2.8	1.1	1.0	5.0
Basic materials	114,371	5.8	8.8	0.0	99.7
Communication	114,371	8.1	5.8	0.0	59.6
Consumer cyclical	114,371	10.7	6.9	0.0	77.5
Consumer defensive	114,371	7.6	7.0	0.0	97.6
Financials	114,371	13.0	9.8	0.0	98.1
Healthcare	114,371	13.8	14.7	0.0	100.9
Industrials	114,371	12.3	8.5	0.0	71.1
Technology	114,371	15.2	11.4	0.0	89.5
Utilities	114,371	2.8	3.9	0.0	41.5
Energy	114,371	3.5	7.1	0.0	99.0
Costs	114,371	1.3	0.5	0.0	4.7
Age	114,371	6.6	2.9	0.1	23.2
Return 2019	114,195	25.8%	0.1	-1.7%	60.8%

Note: Net assets is the logarithm of net asset value; Morningstar rating represents the fund's risk adjusted return relative to similar funds at the end of 2019 ; Basic materials, Communication, Consumer cyclical, Consumer defensive, Financials, Healthcare, Industrials, Technology, Utilities, Energy represents the business sector the funds are exposed to; Costs is the fund's TER; Age is the difference between the actual date and fund's launch date ; returns 2019 is fund's net return in 2019.
Sources: Morningstar Direct, Refinitiv Lipper, ESMA.

Chart 5

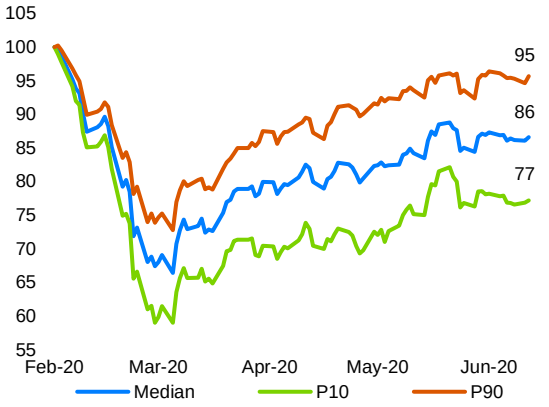
Total net return index – ESG funds



Note: EU 27 equity active ESG UCITS, median, 10th and 90th percentile of daily total return index. 19 February 2020 = 100. Figures report the last observation for each index.
Sources: Morningstar Direct, ESMA.

Chart 6

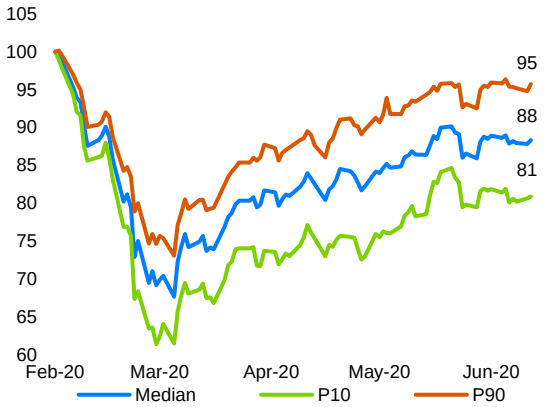
Total net return index – non-ESG funds



Note: EU 27 equity active non-ESG UCITS, median, 10th and 90th percentile of daily total return index. 19 February 2020 = 100. Figures report the last observation for each index.
Sources: Morningstar Direct, ESMA.

Chart 7

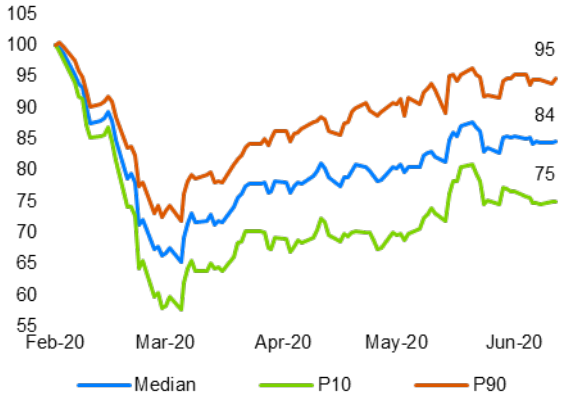
Total net return index – High-rated funds



Note: EU 27 equity active high-rated UCITS, median, 10th and 90th percentile of daily total return index. 19 February 2020 = 100. Figures report the last observation for each index.
Sources: Morningstar Direct, ESMA.

Chart 8

Total net return index – Low-rated funds



Note: EU 27 equity active low-rated UCITS, median, 10th and 90th percentile of daily total return index. 19 February 2020 = 100. Figures report the last observation for each index.
Sources: Morningstar Direct, ESMA

Table 9

Regressions with interaction between the ESG flag and the sustainability rating

	Compound return				Cumulative flows			
	Whole period (1)	Crisis (2)	Recovery (3)	Stabi-lisation (4)	Whole period (5)	Crisis (6)	Recovery (7)	Stabi-lisation (8)
Non-ESG high-rated funds	0.007**	0.010***	-0.003	-0.004***	0.016	0.007	0.003	0.006
	(0.003)	(0.002)	(0.003)	(0.001)	(0.010)	(0.006)	(0.009)	(0.004)
ESG low-rated funds	0.001	0.013***	-0.003	0.005	0.060**	0.026***	0.006	0.010
	(0.005)	(0.004)	(0.005)	(0.003)	(0.029)	(0.008)	(0.008)	(0.014)
ESG high-rated funds	0.009***	0.015***	-0.004	-0.003**	0.033**	0.022**	0.002	0.009*
	(0.003)	(0.003)	(0.003)	(0.001)	(0.015)	(0.009)	(0.009)	(0.005)
Size	0.003***	0.006***	0.001*	0.000	0.013***	0.008**	0.005*	0.002
	(0.001)	(0.001)	(0.000)	(0.000)	(0.004)	(0.003)	(0.003)	(0.002)
Star rating =5	0.045***	0.027***	0.015***	-0.001	0.070**	0.041**	0.005	0.029***
	(0.008)	(0.008)	(0.003)	(0.003)	(0.027)	(0.019)	(0.013)	(0.009)
Costs	0.006***	0.009***	-0.002	0.000	0.024*	0.013	0.012**	0.012***
	(0.002)	(0.003)	(0.002)	(0.001)	(0.013)	(0.009)	(0.005)	(0.004)
Age	0.000	-0.001**	-0.000	0.000	-0.006***	-0.004***	-0.001	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)	(0.001)	(0.001)	(0.001)
2019 return					0.278***	0.120**	0.061	0.077*
					(0.085)	(0.051)	(0.038)	(0.040)
Sectors	Significant sectors: Consumer cycl., Energy, Financial, Healthcare, Technology							
Constant	-0.217***	-0.285***	-0.001***	-0.021**	-0.300**	-0.221**	-0.040	0.010
	(0.025)	(0.032)	(0.024)	(0.010)	(0.123)	(0.089)	(0.068)	(0.050)
Obs	85,387	29,106	29,327	26,954	84,052	28,709	28,749	26,252
R^2	0.21	0.06	0.29	0.36	0.15	0.12	0.15	0.12

Note: The ESG dummy variable and the dummy identifying high rated funds are interacted in order to create 4 categories of funds: non-ESG low-rated funds (reference category), non-ESG high-rated funds, ESG low-rated funds and ESG high-rated funds; Size is the logarithm of net asset value; Star rating=5 represents the fund's risk adjusted return relative to similar funds at the end of 2019; Costs is the fund's TER; Age is the difference between the actual date and fund's launch date. Sectors report the sectors that show the highest correlation with performance. The Morningstar category variables, the sectoral exposures, and the performance ratings lower than five are hidden from the results. The standard errors are clustered on the Morningstar Category. Significance levels are reported as follows: (0.01 (***), 0.05 (**), 0.1(*)).
Sources: Morningstar Direct, Refinitiv Lipper, ESMA.

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