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Are ethical and green investment funds more resilient?

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Abstract

Funds with an environmental, social and corporate governance (ESG) mandate have been growing rapidly in recent years and received inflows also during periods of market turmoil, such as March 2020, in contrast to their non-ESG peers. This paper investigates whether investors in ESG funds react differently to past negative performance, making these funds less sensitive to short-term changes in returns. In the absence of an ESG-label, we define an ESG- or Environmentally-focused fund if its name contains relevant words. The results show that ESG/E equity and corporate bond funds exhibit a weaker flow-performance relationship compared to traditional funds in 2016-2020. This finding may reflect the longer-term investment horizon of ESG investors and their expectation of better risk-adjusted performance from ESG funds in the future. We also explore how the results vary across institutional and retail investors and how they depend on the liquidity of funds' assets and wider market conditions. A weaker flow-performance relationship allows funds to provide a stable source of financing to the green transition and may reduce risks for financial stability, particularly during turmoil episodes.

JEL classification: G11, G23, Q56, C58
Key words: investment funds; sustainable investments; green finance; climate risk

Non-technical summary

Assets under management of global ESG funds increased rapidly in the last six years, from €0.5 trillion in 2015 to €1.3 trillion in June 2021. The capital flows towards this type of funds are expected to be significant also in the future, due to the gradual wealth transfer to millennials and rising investor awareness of climate change and related policies, also driven by the increased frequency and severity of natural catastrophes.

Investors' preference for green investments has been confirmed also during the Covid-19 market turmoil: in March 2020, ESG investment funds suffered lower outflows compared to their traditional counterparts and have also recovered faster and to a larger extent in the following months. However, this seemingly higher resilience of ESG funds cannot be explained by higher financial returns, as ESG and non-ESG funds generally show a similar performance at a monthly level. This paper examines whether the flow-performance relationship of ESG and Environmental (E)-focused bond and equity funds is different from the one exhibited by traditional funds. We are interested in analysing whether investors in ESG/E-focused funds are less sensitive to negative past performance.

First, we complement the existing literature on ESG funds by analysing ESG investors' behaviour over a long time period, covering the Covid-19 market turmoil, and considering both bond and equity funds, retail vs institutional fund shares, and more vs less liquid funds. We employ a unique data set including monthly share observations of both bond and equity funds from January 2016 until December 2020. We identify ESG/E-focused funds by searching relevant words in funds' names (e.g. "ESG", "Sustainable", "Green" etc.). We argue that investors may not check the funds' prospectuses, therefore the use of certain words represents a first signal that a fund employs ESG/E-focused criteria in its investment decisions.

We find that in both bond and equity funds, investors in ESG/E-focused funds are less sensitive to past negative returns. This result is robust when considering separately retail and institutional shares and it also remains unchanged during normal and crisis periods. In addition, for the bond funds sample, we demonstrate that ESG/E-focused investors do not withdraw following bad performances even in less liquid funds.

Our results have several policy implications. First, a weaker flow-performance relationship may have a positive financial stability impact on ESG bond funds: a lower sensitivity of investors to past negative performance can mitigate the high first-mover

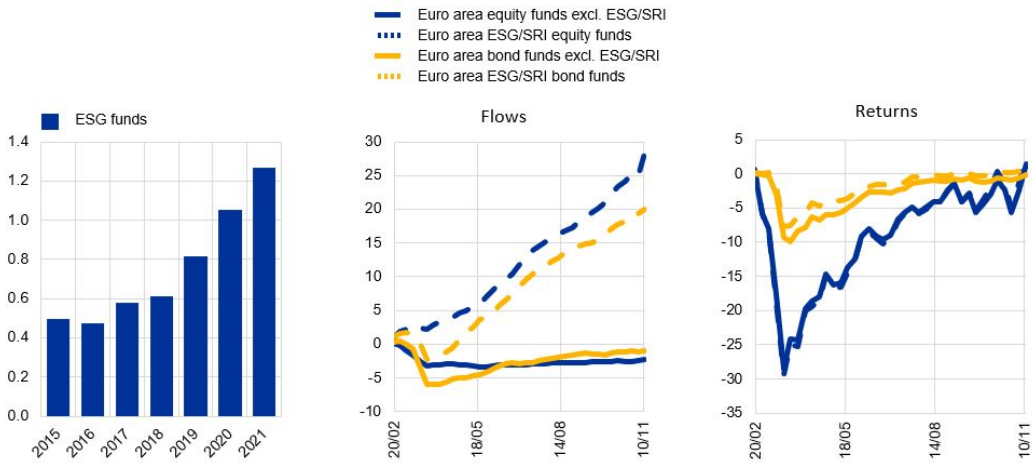
advantage existing in more illiquid funds, thus reducing the probability of fund managers fire-selling assets to accommodate large redemption requests. Second, a high resilience of ESG fund flows to negative performance may be beneficial for the green transition, as it ensures a stable source of finance also in periods of high uncertainty and market volatility.

1 Introduction

Assets under management of global ESG funds have soared in the last years, reaching almost €1.3 trillion in June 2021, from €0.5 trillion in 2015 (Figure 1, left panel). This trend is expected to continue thanks to the gradual wealth transfer to millennials and rising investor awareness of climate change and related policies, also driven by the increased frequency and severity of natural catastrophes.

In March 2020, during the worst market turmoil since 2008, ESG equity and bond funds experienced between 3 and 4 pp lower outflows than their non-ESG peers. Also, ESG equity (ESG bond) funds recovered much faster, showing an overall c.25% (c.20%) growth of assets under management (AuM) in 2020, while non-ESG funds barely returned to the levels of AuM at the beginning of 2020 (Figure 1, middle panel). The higher resilience of ESG fund flows to the market shock may be explained only partially by their higher returns, as ESG and non-ESG funds exhibit similar monthly performance. The return of ESG bond funds in March 2020 was -7% vs. -9% of their non-ESG peers, while ESG and non-ESG equity funds displayed a return of -29% (Figure 1, right panel).

Figure 1: Growth of ESG funds and performance during the Covid-19 turmoil



Source: Bloomberg Finance L.P., EPFR Global and ECB calculations

In this paper, we test the hypothesis that investors in ESG and Environmental-focused funds (E-funds)[1] are less sensitive to negative performance than non-ESG fund investors, as suggested by the the dynamics of flows and returns in the market turmoil in March 2020. We estimate this sensitivity on an extended sample of over 11 000 funds between 2016 and 2020. Such an extended period of time includes various periods of market development including market distress, comparable to the 2007-2009 financial crisis. Although other papers have looked at this question in the past, we are the first to test the flow-performance relationship of ESG and non-ESG funds in a comprehensive and systematic manner: first, separately for ESG and Environmental funds; second, for both bond and equity funds; third, for a longer time period, 2016-2020; finally, with the distinction between retail and institutional investors.

The literature provides several theoretical justifications to this hypothesis. First, ESG investors have been shown to be willing to forgo short-term returns and volatility to pursue their ethical and environmental goals. Hartzmark and Sussman (2019) and Dottling and Kim (2020) argue that investors may value sustainability more than performance and therefore they are more committed to funds that share these values in their mandates. In addition, Krueger et al. (2020) show, based on survey results, that institutional investors may account for climate risks in their decisions also because of considerations related to investors' reputation, investors' moral/ethical concerns, and legal/fiduciary duties. Riedl and Smeets (2017) also suggest that ESG investors are more committed to long-term investment horizons and therefore pose lower risks in terms of demand volatility. Finally, investors may expect higher risk-adjusted returns from sustainable investments in the future, as a result of carbon policies. Kuang and Liang (2021) support this hypothesis by showing that investors are more sensitive to poor performance of funds with a higher carbon risk portfolio.

We construct a unique dataset by combining a number of data sources and classifying funds as ESG or non-ESG. We obtain flows, returns and portfolios of euro area funds from Lipper Refinitiv. We identify retail and institutional fund shares using ECB Securities Holdings Statistics by Sector (SHSS), and we assess funds' portfolio liquidity using the ECB Centralised Securities Database (CSDB). We classify ESG- and E-focused funds as those that market themselves as such via the use of certain words in their names, e.g.

[1] In the remainder of the paper we use Environmental-focused funds, E-funds and green (or green ESG) funds interchangeably.

"Climate", "Environment", "Sustainable", "Green", "ESG" etc. We use this approach as there is no regulatory standard or label to identify ESG/E-funds. Data providers, such as Morningstar and Bloomberg, provide information if a fund is classified as ESG by looking at the names and prospectuses or by analysing their assets. However, these classifications provided by different providers correlate only partially, raising concerns about greenwashing (Boffo and Patalano (2021), Berg et al. (2020)). We argue that looking at fund names is the easiest way in which investors can identify ESG funds. IMF (2021) confirms that labels are an important driver of fund flows. In our analysis, we focus purely on investors' perception of a fund being ESG/Environmental and not if a fund truly pursues ESG/Environmental investment strategy, in contrast for example to Kuang and Liang (2021), who study the flow-performance relationship of funds, according to the exposure of their portfolio to carbon risk.

We run an econometric analysis to estimate the flow-performance relationship of ESG- and E-focused equity and bond funds, compared to their non-ESG peers, adapting the state-of-art specification by Goldstein et al. (2017). In addition, we explore how the results vary across institutional and retail investors and according to the liquidity of funds' assets and wider market conditions. Our results suggest that both retail and institutional investors in ESG and E-funds are less sensitive to past negative performance, even in periods of market distress and funds' illiquidity, suggesting a higher resilience of these funds. The results are robust to alternative specifications and inclusions of controls. In particular, the lower sensitivity of ESG fund flows to negative returns is not explained by the rapid growth of the ESG fund sector. At the same time, we find that the difference between the sensitivities of ESG and non-ESG funds is statistically different only for ESG equity funds.

These results suggest that financial markets can help support the transition to a more sustainable economy by channeling capital from investors to sustainable projects, particularly, if investors turn out to be less sensitive to low(er) performance. The continuing shift towards ESG and E-funds can help foster the green transition, especially because it is mostly focused in the equity markets, which have been shown to be effective in financing green projects (see De Haas and Popov (2019)). However, for these investments having a positive impact on the transition, greenwashing risk should be addressed. Greenwashing represents a risk both for the green transition and for financial stability and, in the absence of clear standards of ESG/E-labels, investors' confidence in the market may

be undermined, leading to significant outflows. A consistent, harmonized and verified ESG/E-label would help reduce such uncertainty and greenwashing risk.

Our paper contributes to several strands of literature. First, it complements existing research on investor behaviour and their sensitivity to past returns. The flow-performance relationship has been extensively studied for conventional funds (see Sirri and Tufano (1998), Chevalier and Ellison (1997), Chen et al. (2010) for equity funds or Goldstein et al. (2017), Chen and Qin (2017), Falato et al. (2021) for bond funds). Several studies have added to this literature by analysing whether ESG or Socially-Responsible Investment (SRI) funds display a different flow-performance relationship than conventional funds (see Renneboog et al. (2011), El Ghoul and Karoui (2017), Benson and Humphrey (2008), Bollen (2007)). They reach the conclusion that investors in socially responsible funds display a weaker flow-performance relationship (at least on the segment of poor returns) compared to their traditional peers. However, Bialkowski and Starks (2016) show that in contrast to the aforementioned studies, SRI investors do not display resilience to poor performance, a finding they explain by the growing number of socially responsible funds in the market.

We add to this literature by using a more recent sample of ESG and conventional funds (covering January 2016 until December 2020), which allows us to study the impact of the Covid-19 crisis. Also, as ESG indicators incorporate three factors (namely the E, S and G factor respectively), we further distinguish funds having an environmental focus. Moreover, we study the presence of a potential different flow-performance relationship between ESG funds and conventional funds for both equity and bond samples. Although equity funds manage most of the assets of funds classified as ESG, bond funds play an increasing role in the sustainable industry. Also, for bond funds, the sensitivity of investors to poor performances (which has been demonstrated by Goldstein et al. (2017), Chen and Qin (2017)) might have financial stability implications. The illiquidity of the assets that bond funds might hold may lead to a stronger first-mover advantage in this type of funds, potentially leading managers to fire-sale their assets in order to reimburse investors wishing to redeem in response to poor performance. Our results suggest that for both equity and bond funds samples, investors in ESG or in environmental-focused funds show resilience to past poor returns, which would allow sustainable funds to provide a more stable source of financing for the green transition. This result is in line with the findings by IMF (2021) that use a quantile regression specification for a sample of sustainable investment funds

worldwide.

Second, our paper contributes to the literature studying whether investors react differently to sustainability indicators depending on their type (namely retail or institutional). Our findings suggest that both types of clientele show greater resilience to poor returns in ESG funds. Our results complement the ones of Dottling and Kim (2020) which show that retail investors redeemed during the Covid-19 shock even from the high-sustainability funds, which they interpret as retail investors perceiving sustainability as being a luxury good during periods of economic distress. Our results are in line with those of Hartzmark and Sussman (2019), Pastor and Vorsatz (2020), which also find that retail, as well as institutional investors favour investments in high-sustainability funds. However, we add to this literature by specifically testing whether the different types of clientele display a distinct sensitivity to past returns. Our results are complementary to those of Kuang and Liang (2021), who find that institutional investors are more responsive to the carbon risk exposures of investment funds' portfolios, unlike retail investors. This, indeed, is plausible, as institutional investors have a larger capacity to access and analyse investment funds' asset holdings.

Finally, a rich literature on the characteristics of ESG investors has emerged recently. Different studies may provide explanations for the resilience of ESG investors that our results show. First, Dottling and Kim (2020), Hartzmark and Sussman (2019), Pastor and Vorsatz (2020), Bauer et al. (2018) argue that investors in sustainable funds are committed to their mandates and that they might value sustainability more than performance. Also, according to Krueger et al. (2020), survey results indicate that the protection of the investors' reputations, their moral/ethical considerations, as well as their legal/fiduciary duties incentivize institutional investors to include climate risks considerations into their decisions. Second, the absence of sensitivity to past 1-month performance in ESG funds might be driven by a longer-term investment horizon displayed by investors in this type of funds (see Riedl and Smeets (2017), Dottling and Kim (2020)). Finally, another plausible explanation for our findings consists of the existence of a belief that sustainable investments will generate higher future returns. The literature provides mixed evidence on whether sustainable investments help achieve higher returns or lower the portfolio risk. Hartzmark and Sussman (2019) do not find evidence that high-sustainability funds outperform low-sustainability ones. In the same vein, Gibson Brandon et al. (2019) demonstrate that returns are not higher in responsible investing. On the other hand, Pastor and Vor-

satz (2020), Ferriani and Natoli (2020), Ammann et al. (2019) show that low-ESG risk funds outperform high-ESG risk funds. Nofsinger and Varma (2014) demonstrate that market stress plays a role in the performance of SRI investments: they outperform during periods of market distress, but they underperform during normal periods. However, the shift towards more assets invested in sustainable products may cause a potentially higher risk-adjusted investment performance. Gibson Brandon and Kruger (2018) prove that a higher performance is achieved if more investments are made into assets with higher environmental characteristics by institutional investors.

The rest of the paper is structured as follows. Section 2 presents the data and the descriptive statistics of our sample. Section 3 describes the empirical specifications and the main results. Section 4 presents robustness tests. Finally, section 5 concludes and discusses the policy implications of our results.

2 Data

2.1 Sample construction

We obtain our two variables of interest (namely the monthly values of assets under management and the raw monthly return) from Lipper Refinitv database. Our sample consists of bond and equity funds domiciled in the euro area (only mutual funds are comprised in our sample). In September 2020, the initial sample covers 57% of the assets managed by euro area bond funds and approximately 60% of the assets managed by euro area domiciled equity funds respectively. The sample covers the period from January 2016 until December 2020 at a monthly frequency, and the analysis is pursued at a share level. A fund typically issues multiple shares targeted to different investors: a larger minimum initial investment and smaller fees attract institutional investors. As our analysis also aims to differentiate investors' reaction to past returns depending on their type, we choose fund shares as our unit of observation. ESG/E shares are defined as such if their name contains specific words. To identify ESG funds, we look at such words in funds' names as "ESG","SRI","Social","Environment", "Climate", "Sustainable", "Green","Governance","Carbon", "Transition", "Ecology", "Responsible", "Durable", "Ethical". The E funds are a subset of ESG funds, and their names contain a sub-range of words specifically linked to environmental concerns, such

as "Environment", "Climate", "Sustainable", "Green", "Carbon", "Ecology"[2]. To define retail and institutional shares, we use ECB internal database on securities holdings statistics at a sector level (SHSS). According to the ECB SDW, the SHSS provide information on holdings of securities by euro area resident sectors at a quarterly frequency. Retail (institutional) shares are identified as those where retail (institutional) investors hold more than 50% of funds' total net assets. Finally, we employ Lipper Refinitiv fund portfolio level data and ECB consolidated securities database (CSDB) to compute the share of a fund's portfolio invested liquid assets. This allows us to create a variable accounting for the fund's liquidity. However, we use the fund's liquidity measure only on the bond fund sample, as stocks in which equity funds invest are liquid instruments. The fund's liquidity measure displays the percentage of the portfolio invested in high quality assets, namely cash and cash equivalents, bonds from euro area governments, supranationals, central banks as well as non-euro area government bonds that have an AA/AAA rating.

We follow several steps in order to arrive at the final sample. First, we use the Lipper schemes variable (indicator of the type of assets that asset managers invest in) in order to keep only corporate bond funds from the sample of overall bond funds. Second, for both equity and corporate bond samples, we keep funds with a global, European or emerging markets investment focus. We follow this strategy in order to keep only a homogeneous group of funds for our analysis and therefore eliminate funds investing only in a single country. Third, in order to avoid incubation bias, we eliminate shares with less than 5 million Euros of assets under management and an age of less than one year. Finally, in order to ensure a certain history of flows for our analysis, we keep only shares displaying at least 12 consecutive non-missing observations of flows. The analysis covers only UCITS funds. Our sample covers 1,803 and 9,437 non-ESG shares, and 206 and 1,274 ESG shares, of active corporate bond and equity funds domiciled in the euro area.

2.2 Descriptive statistics

Figure 2 and 3 present the summary statistics for equity and bond funds respectively. Flows are defined in relative terms over the previous month assets. Over the sample period, non-ESG equity funds record an average outflow of -0.11%, while ESG equity funds record an average inflow of 0.66%. The average inflow is also bigger for ESG funds in the bond funds sample (0.84% average monthly inflow for ESG funds compared

[2]In the dictionary of search words, we include all these words in different European languages.

to 0.34% for conventional counterparts). Excess returns are defined as the share's raw return in excess of the risk-free rate (monthly yield of 10-year AAA-rated government bonds issued by euro area countries). The median monthly excess return for non-ESG equity funds is slightly lower than the one reported by ESG or green ESG counterparts (0.98% compared to 1.19% and 1.31% respectively). On the contrary, for bond funds, the median monthly return is positive and slightly higher for non-ESG funds than for the ESG or green ESG counterparts (0.34% compared to 0.29% and 0.23% respectively). The median age of a conventional equity fund is around 6.5 years, while the one of a green ESG fund is approximately 6 years. Bond green ESG funds are only slightly younger than their traditional counterparts. On average, bond non-ESG funds hold more liquid assets in their portfolio compared to the ESG counterparts (on average, 4.45% of their portfolio is invested in high quality assets compared to 2.91% reported by ESG bond funds).

Figure 2: Summary statistics (equity funds)

		Mean	Std Dev	P5	P50	P95	N
Non-ESG	Flows(%)	-0.11	3.72	-8.37	-0.04	9.08	380 909
	Return(%)	0.69	4.33	-6.74	0.98	6.77	380 909
	Ln(TNA)	17.67	1.38	15.73	17.51	20.17	380 909
	Ln(age)	1.86	0.83	0.4	1.89	3.08	380 909
All ESG	Flows(%)	0.66	3.89	-7.27	0	9.46	42 856
	Return(%)	0.86	4.37	-6.92	1.19	7.15	42 856
	Ln(TNA)	17.71	1.33	15.74	17.61	20.02	42 856
	Ln(age)	1.71	0.89	0.25	1.73	3.04	42 856
Green ESG	Flows(%)	0.88	4.05	-6.9	0.02	9.46	21 647
	Return(%)	0.98	4.38	-6.91	1.31	7.62	21 647
	Ln(TNA)	17.57	1.31	15.69	17.43	19.93	21 647
	Ln(age)	1.72	0.88	0.25	1.79	3.02	21 647

Figure 4 displays the evolution of assets managed by bond and equity funds from January 2016 until December 2020. This evolution is further split between conventional funds and ESG funds. We can observe that over the sample period, the assets managed by the overall system increased (by approximately 50% for bond funds and by 55% for equity funds respectively). The assets managed by ESG funds account for an increasing part of the total assets managed by mutual funds. ESG bond funds managed around 5% of the total assets in 2016 and around 10.5% in December 2020. The same evolution is reported by equity ESG funds: beginning 2016 they managed 6.4% of the total assets compared to 13.8% in December 2020.

Figure 5 shows the effect of the Covid-19 crisis on the assets managed by bond and eq-

Figure 3: Summary statistics (bond funds)

		Mean	Std Dev	P5	P50	P95	N
Non-ESG	Flows(%)	0.34	4.79	-9.69	0	12.56	54 522
	Return(%)	0.3	2.18	-2.37	0.34	3.19	54 522
	Ln(TNA)	17.69	1.41	15.72	17.56	20.23	54 522
	Ln(age)	1.74	0.69	0.46	1.79	2.85	54 522
	HQLA	4.45	8.09	-0.68	3.15	14.59	54 522
All ESG	Flows(%)	0.84	5.08	-9.69	0	12.56	4 442
	Return(%)	0.28	1.85	-1.73	0.29	2.74	4 442
	Ln(TNA)	17.67	1.16	15.96	17.52	19.87	4 442
	Ln(age)	1.49	0.79	0.24	1.49	2.75	4 442
	HQLA	2.91	3.98	-1.59	2.49	9.03	4 442
Green ESG	Flows(%)	0.89	4.9	-8.46	0.01	12.56	2 117
	Return(%)	0.25	1.7	-1.69	0.23	2.49	2 117
	Ln(TNA)	17.93	1.3	15.95	17.8	20.05	2 117
	Ln(age)	1.67	0.89	0.25	1.66	3.4	2 117
	HQLA	3.38	3.98	-0.62	2.62	9.62	2 117

uity funds as well as on their returns. We generally observe strong outflows in March 2020, although less massive in ESG funds compared to non-ESG counterparts (traditional bond funds suffered outflows of 13% in March 2020 compared to 9% recorded by ESG peers). The difference between the two samples gets slightly smaller in the equity funds sample (22% of outflows recorded by conventional equity funds compared to approximately 19.6% reported by ESG peers). ESG funds recovered faster than their non-ESG counterparts in the months following the crisis. In 2020, ESG bond funds increased their assets under management by approximately 22.6%, while non-ESG peers saw a slight increase in the assets under management (1.6%). In the equity sample, ESG funds managed 22% more assets in December 2020 compared to January 2020. On the contrary, non-ESG funds did not completely recover during the same time period: end 2020 they managed 1% less assets than in January 2020.

Figure 4: Evolution of TNA and share of ESG funds by type

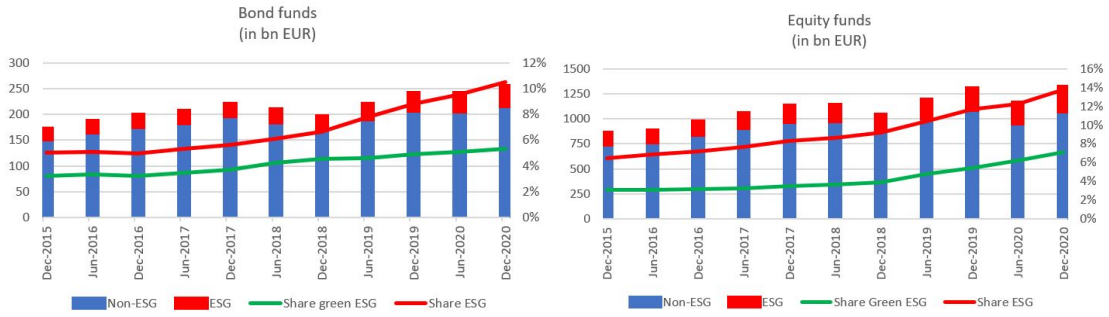


Figure 5: Cumulative flows and returns in 2020 by type

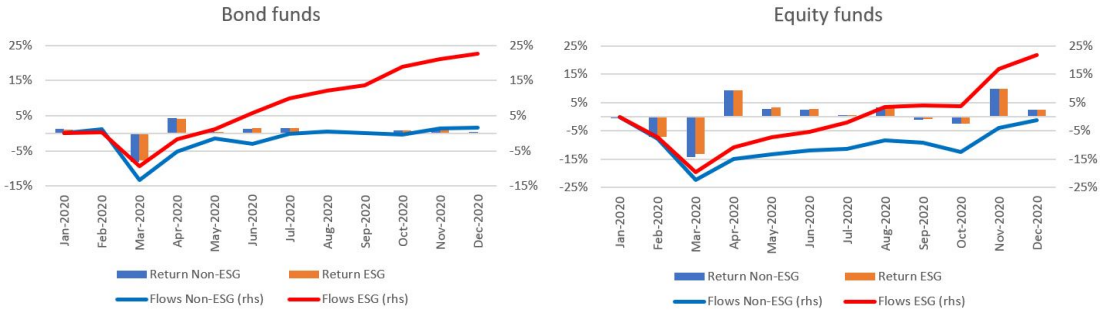
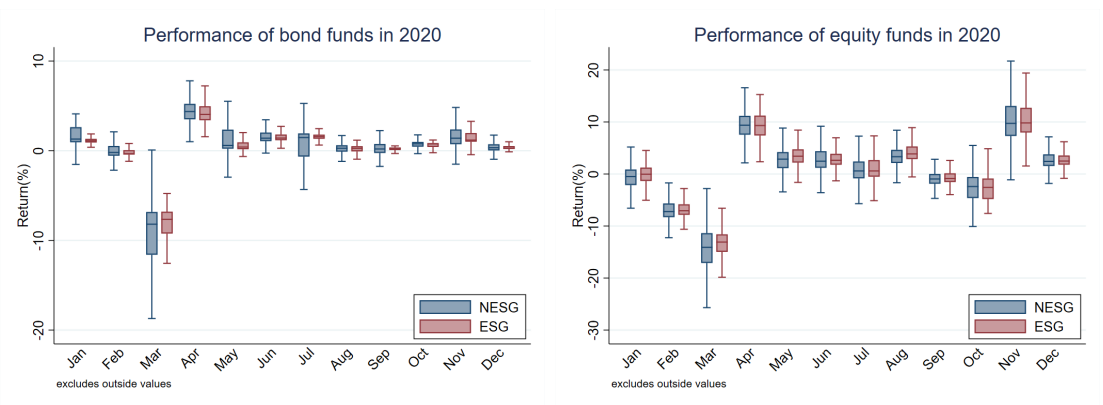


Figure 5 also displays the median monthly excess return by fund type. We can observe that the ESG and non-ESG counterparts were displaying a similar return. The interquartile range of performance is shown in figure 6. On average, ESG funds (both bond and equity) show higher returns than the non-ESG peers, but the difference between the two samples is small. Bond ESG funds show less volatile returns compared to their non-ESG counterparts (however, this may be due to a smaller sample of ESG bond funds).

Figure 6: Monthly interquartile range of excess returns in 2020



3 Results

3.1 Baseline regression

We employ a model as in Goldstein et al. (2017). The model allows us to test the existence of a potential non-linearity in the flow-performance relationship. Indeed, investors may react differently to positive and negative returns. A difference in investors' response between positive and negative returns might have financial stability consequences espe-

cially during crisis periods. If it is demonstrated that investors withdraw in response to past negative returns, their behaviour may have a detrimental effect if managers need to fire-sell assets in order to respond to outflows.

In this section we report the results on the sensitivity of flows into E-focused, ESG and non-ESG funds following past performance. We expect investors to be less sensitive to past performance of ESG/E-focused funds for several reasons: first, ESG/E-focused funds may attract more ethical and socially responsible investors as suggested by Dottling and Kim (2020), Hartzmark and Sussman (2019). Second, investors may perceive these funds as less exposed to ESG and climate-related risks or managing these risks better due to better awareness and thus expect better returns in the future. The last argument is in line with Pastor and Vorsatz (2020) who find that high-sustainability funds performed better during the Covid turmoil. We employ a baseline regression of the following form to test the flow-performance relationship for ESG and non-ESG funds:

$$\begin{aligned} Flows_{i,t} &= \alpha + \beta_1 RetPosESG_{i,t-1} + \beta_2 RetPosNESG_{i,t-1} + \beta_3 RetNegESG_{i,t-1} + \\ &+ \beta_4 RetNegNESG_{i,t-1} + \beta_5 I(LaggedReturn < 0)_{i,t-1} + \\ &+ \beta_6 I(LaggedReturn < 0)_{i,t-1} \times ESG + \beta_7 ESG + \\ &+ \gamma Controls_{i,t} + \delta_i + \lambda_{ESG,t} + \epsilon_{i,t}, \end{aligned} \tag{1}$$

where the dependent variable represents the share relative net flows between month t and t-1. The four main independent variables account for non-linearities at the share past excess return levels[3][4]: $RetPosESG$ and $RetPosNESG$ are the past positive return of ESG and non-ESG shares respectively and 0 otherwise. $RetNegESG$ and $RetNegNESG$ correspond to the past negative return of ESG and non-ESG shares respectively and 0 otherwise. ESG is an indicator variable equal to one if the fund is marketing itself as taking into account ESG criteria in its investment decisions and zero otherwise. $I(LaggedReturn < 0)$ is an indicator variable equal to one if the share displays a negative past excess performance and zero otherwise. The baseline coefficients of interest are based

[3]Instead of using the past level of raw returns, one could also rank funds between themselves and construct a ranking variable, as in Sirri and Tufano (1998). However, we chose not to pursue this strategy in order to test the non-linearity of the relationship. While it can be true that investors compare a fund's performance to its peers, a ranking strategy would not be adapted to measure an investor's reaction to a common shock that affect funds similarly (as it was the case during the Covid turmoil).

[4]The excess performance is calculated as the difference between the raw return and the monthly yield of 10-year AAA-rated government bonds issued by euro area countries.

on a triple-interaction term between the share's past return, the $I(LaggedReturn < 0)$ dummy and the ESG dummy. The reported results and t-statistics are based on selected sums of coefficients. Annex 1 (table 7) provides an explanation of how the four coefficients of interest are constructed. $Controls_{i,t}$ comprise a series of lagged control variables, such as the natural logarithm of age, size, past flows of the share, as well as the standard deviation of the past 12 monthly excess returns, which represents a proxy for the riskiness of the fund's portfolio. In order to account for unobserved time-fixed share-level effects, we introduce fixed effects at the share level. Moreover, month fixed effects need to be introduced to control for the growing assets under management of investment funds. However, as figure 4 shows, the positive trend in assets is more pronounced for funds labeled as ESG compared to traditional peers. Therefore, in order to take into account this different trend we introduce crossed ESG and month fixed effects. Furthermore, we cluster errors by share class to allow for intertemporal dependence of regression residuals across shares.

Table 1: Flow-performance relation: ESG versus non-ESG peers
Specification using name classification and excess returns

	Equity funds		Bond funds	
	(1)	(2)	(3)	(4)
	All ESG	Green ESG	All ESG	Green ESG
	Flows	Flows	Flows	Flows
Ret Pos ESG	0.059***	0.097***	-0.172	-0.022
	(3.42)	(3.73)	(-1.11)	(-0.10)
Ret Pos NESG	0.051***	0.052***	0.021	0.021
	(10.12)	(10.16)	(0.75)	(0.73)
Ret Neg ESG	0.015	0.056	0.127	-0.123
	(0.56)	(1.48)	(0.79)	(-0.80)
Ret Neg NESG	0.069***	0.068***	0.077***	0.077***
	(10.69)	(10.66)	(2.83)	(2.84)
I(Lagged Return<0)	-0.001***	-0.001***	-0.001**	-0.001**
	(-4.60)	(-4.59)	(-2.05)	(-2.07)
I(ESG) x I(Lagged Return<0)	0.000	0.001	0.001	0.005
	(0.29)	(1.24)	(0.50)	(1.07)
Ln(age)	-0.009***	-0.009***	-0.007***	-0.007***
	(-12.50)	(-12.17)	(-3.42)	(-3.15)
Ln(size)	-0.009***	-0.010***	-0.014***	-0.013***
	(-29.84)	(-29.21)	(-14.61)	(-13.84)
Lagged Flows	0.170***	0.171***	0.153***	0.152***
	(50.12)	(49.13)	(21.89)	(20.99)
Std Dev Ret	-0.002***	-0.002***	-0.003***	-0.003***
	(-14.79)	(-14.72)	(-6.17)	(-6.12)
Constant	0.193***	0.194***	0.262***	0.257***
	(33.94)	(33.18)	(15.74)	(14.85)
Share FE	Yes	Yes	Yes	Yes
Month x ESG FE	Yes	Yes	Yes	Yes
Cluster	Share	Share	Share	Share
H0: Ret Neg ESG = Ret Neg NESG	0.046**	0.736	0.761	0.198
Adj. R^2	0.2	0.198	0.154	0.152
Observations	324 022	307 903	64 467	61 417
Sample	Name classification, Excess returns			

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

This table shows the flow-performance relationship for ESG and for non-ESG funds. We regress share's flows on share's past excess returns. An asymmetry in investor response is tested with respect to past negative and positive performance. Moreover, we also test an asymmetry in investor response to past returns with respect to a share being considered an ESG or a conventional fund share. The following control variables are introduced: Ln(age) indicates the past natural logarithm of share's age (expressed in years), Ln(size) indicates the past natural logarithm of share's size, share's lagged flows and the standard deviation of the past 12 monthly returns. The sample covers January 2016 - December 2020 and is at a monthly frequency. ESG/E-funds are defined according to the use of certain words in funds' names. The first 2 columns show the results for equity funds (the Green ESG are considered instead of All ESG in the second column), while the 2 last columns show the results for bond funds. Share fixed effects and crossed month and ESG fixed effects are introduced. Observations are clustered at a share level.

Columns 1 and 2 in Table 1 present the results for the baseline specification of the flow-performance relationship for ESG and Environmentally-focused equity funds respectively. All the control variables exhibit significant and expected effects, in particular, age, size and lower volatility of returns reduce the net flows, while flows also show certain persistence. Our main result is that investors in ESG and E-funds do not show statistically significant sensitivity to past negative performance, while investors in non-ESG equity funds respond to a 1 pp decrease in the negative returns by increasing their outflows of 0.069 pp. The difference in behaviour between investors in ESG and non-ESG equity funds is also statistically significant, at 5% . As pointed out by Goldstein et al. (2017), the positive flow-performance relationship in corporate bond funds may have negative implications for markets and financial stability due to a first-mover advantage and low liquidity of funds' assets. Columns 3 and 4 in Table 1 present the results for the same specification for ESG and green corporate bond funds respectively. We confirm the finding of Goldstein et al. (2017), namely that flows into corporate bond funds are sensitive to past negative performance with an 1 pp decrease in the negative returns leading to 0.077 pp higher outflows. In contrast, the sensitivity of flows into ESG and green bond funds appear to be negative but not statistically significant. However, the difference between the coefficients of ESG/green and non-ESG negative returns is not statistically significant. One reason behind this result can be a much smaller sample for ESG and environmental bond funds.

As previously mentioned, we define ESG/E- focused funds by using the name of the funds. However, it is important to test the robustness of our baseline result when using other classifications, such as the Morningstar globes (which would allow us to identify ESG funds as in Hartzmark and Sussman (2019) for example)

We first test the robustness of our results with respect to Morningstar globes in table 2. Columns 1 and 3 show the baseline results, where ESG funds are classified as such based on the name of the fund, while columns 2 and 4 show the results when using the Morningstar globes classification. However, as the Morningstar globes began to be consistently reported starting with 2019, table 2 presents the results of our baseline regression ran on a sample covering January 2019 until December 2020 (this also explains the difference in the number of observations in columns 1 and 3 in table 2 compared to columns 1 and 3 in table 1). In columns 2 and 4, ESG funds are defined as those having 4 or 5 globes according to Morningstar. Non-ESG funds are defined as having 1, 2 or 3 globes according

Table 2: Flow-performance relation: ESG versus Non-ESG peers
Specification using name classification or Morningstar globes

	Equity funds		Bond funds	
	(1)	(2)	(3)	(4)
	Name	Globes	Name	Globes
	All ESG		All ESG	
	Flows	Flows	Flows	Flows
Ret Pos ESG	0.037*	-0.000	-0.229	0.157
	(1.91)	(-0.01)	(-1.36)	(0.89)
Ret Pos NESG	0.033***	0.039***	0.006	0.005
	(5.69)	(4.24)	(0.21)	(0.11)
Ret Neg ESG	-0.002	0.072***	0.045	-0.290
	(-0.07)	(4.07)	(0.27)	(-1.52)
Ret Neg NESG	0.057***	0.040***	0.094***	0.134***
	(7.63)	(3.37)	(2.89)	(3.43)
I(Lagged Return<0)	-0.001**	-0.001	-0.000	0.000
	(-2.39)	(-1.07)	(-0.29)	(0.15)
I(ESG) x I(Lagged Return<0)	-0.000	-0.000	-0.001	0.001
	(-0.40)	(-0.40)	(-0.25)	(0.18)
Ln(age)	-0.003**	-0.001	-0.001	0.003
	(-2.44)	(-0.55)	(-0.13)	(0.51)
Ln(size)	-0.015***	-0.015***	-0.024***	-0.024***
	(-24.00)	(-17.81)	(-16.67)	(-13.46)
Lagged Flows	0.115***	0.111***	0.117***	0.111***
	(29.23)	(21.09)	(14.07)	(10.53)
Std Dev Ret	-0.003***	-0.002***	-0.003***	-0.002***
	(-12.74)	(-7.87)	(-4.79)	(-3.14)
Constant	0.281***	0.275***	0.432***	0.436***
	(25.40)	(18.48)	(16.51)	(12.91)
Share FE	Yes	Yes	Yes	Yes
Month x ESG FE	Yes	Yes	Yes	Yes
Cluster	Share	Share	Share	Share
H0: Ret Neg ESG = Ret Neg NESG	0.063*	0.125	0.779	0.03**
Adj. R^2	0.23	0.22	0.18	0.17
Observations	176 292	97 695	35 015	21 939
Sample	Name or Morningstar globes classification, Excess returns			

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

This table shows the flow-performance relationship for ESG and for non-ESG funds. We regress share's flows on share's past excess returns. An asymmetry in investor response is tested with respect to past negative and positive performance. Moreover, we also test an asymmetry in investor response to past returns with respect to a share being considered an ESG or a conventional fund share. The following control variables are introduced: Ln(age) indicates the past natural logarithm of share's age (expressed in years), Ln(size) indicates the past natural logarithm of share's size, share's lagged flows and the standard deviation of the past 12 monthly returns. The sample covers January 2019 - December 2020 and is at a monthly frequency. In columns 1 and 3 ESG funds are defined according to the use of certain words in funds' names. In columns 2 and 4 ESG funds are defined as those having 4 or 5 globes assigned by Morningstar. The first 2 columns show the results for equity funds, while the 2 last columns show the results for bond funds. Share fixed effects and crossed month and ESG fixed effects are introduced. Observations are clustered at a share level.

to Morningstar[5]. However, it may happen that a fund switches from being considered as ESG to non-ESG (for example if it switches from 3 to 4 globes). We choose to drop from the analysis these funds as we prefer analysing funds that consistently report being ESG or non-ESG[6]. This choice explains the different number of obseervations between columns 1 and 2 (3 and 4 respectively).

Columns 1 and 2 report the results for the equity sample. We observe that the effect of past positive returns (either in the case of ESG funds or non-ESG) is robust between the two classifications. However, higher past negative returns seem to lead to stronger outflows in the ESG funds classified as such by Morningstar globes. This finding is in contrast with the insignificant coefficient found for the ESG funds defined according to the name. This result may indicate that in equity funds, investors are naive and blindly trust the name of the fund[7]. However, in the bond fund space, we observe that results are robust when considering the two different classifications of funds. The analysis of the distribution of funds based on each classification also helps explaining the result. In the bond fund space, around 60% of the ESG funds classified according to the name are also classified as being ESG based on the Morningstar globes. However, this ratio falls to almost 30% in the equity fund space, which suggests a low overlap between the two classifications.

As we study a sample of funds domiciled in the euro area, one may argue that our results could also be driven by stronger environmental concerns in Europe compared to the US. In order to examine this question, the first two columns of the tables present in Annex 2 separate equity fund shares in table 10 (bond funds respectively in table 11) between euro area based and non euro area based shares. We define a share as being based in the euro area if the SHSS (which reports the shares detained by euro area investors) explains more than 75% of the share's assets at least once during our sample history. Non euro area shares are defined as such if the SHSS always explains less than 75% of the share's assets. If the findings were driven by our sample choice, we could expect that the coefficient $RetNegESG$ of euro area based shares is insignificant, while the same coefficient would be statistically significant in the non euro area shares.

[5]Missing values of the globes are not taken into account, meaning that a fund will always be considered ESG if it always had 4 or 5 globes irrespective of the number of missing observations.

[6]The effect of losing or gaining globes on flows would be an interesting analysis in itself. However, this analysis is beyond the scope of this work.

[7]The sophistication of the underlying investors does not seem to play a role in explaining the results, as in unreported results we observe that both retail and institutional investors redeem more following a decrease of the negative performance in ESG funds defined by using the Morningstar globes

We observe that this is never the case, either in the equity sample (table 10) or in the bond sample (table 11). In order to test the robustness of this result, we also separate shares according to their currency of denomination. Here we suppose that EUR/GBP-denominated shares have mostly European investors, while USD-denominated shares are mostly invested by Non-European investors. We observe that our previous results are robust to this specification as the coefficient of our variable of interest $RetNegESG$ does not display a statistical significance (however, in table 11 one column has a positive and significant coefficient for the $RetNegESG$ in the USD sample). Based on these results, we can therefore infer that our results are not driven by stronger environmental concerns displayed by European investors.

3.2 Difference in behavior between retail and institutional investors

Using the same baseline specification, we test if retail and institutional investors respond differently to past negative performance. A share is considered as being a retail (institutional) share if retails (institutionals) detain more than 50% of the assets [8]. Kuang and Liang (2021) find that institutional investors are sensitive to higher carbon risk in funds' portfolios while retail investors are not. The main rationale behind that finding is possibly a larger capacity of institutional investors to access and analyse investment funds' portfolios. In our case, we do not necessarily expect retail and institutional investors to behave differently as we focus on investors' perception of a fund being ESG/E-focused by looking at its name that is equally available for both types of investors. Using a sustainability fund classification based on the Morningstar globes, Hartzmark and Sussman (2019), Pastor and Vorsatz (2020) find that both retail and institutional investors prefer to invest into high-sustainability funds.

Tables 3 and 4 report the results for equity and bond funds respectively. For the equity funds, our results suggest that retail and institutional investors behave similarly, i.e. they are sensitive to past negative performance in non-ESG funds but not in ESG/E-funds. However, the difference in the coefficients displays a low significance or is not anymore significant. For bond funds, the main results are confirmed, however, the split of the sample into retail and institutional investors leads to loss in power with coefficients remaining

[8] A 75% threshold has also been tested and results remain globally unchanged.

significant but only at 10% for the retail sample. Also in the retail space, investors reward past good performers with inflows, as shown by the positive and significant coefficient of $RetPosNESG$.

3.3 The effect of crisis periods

In this section, we analyse if our results are confirmed during periods of stress: more specifically, if ESG/green investors remain in the poorly performing funds during periods of high market uncertainty. Pastor and Vorsatz (2020) demonstrate that the outflows experienced by funds during the COVID-19 turmoil can be explained by the sustainability globes granted by Morningstar. They have shown that low-sustainability funds experienced the highest outflows, while their high-sustainability peers suffered significantly less outflows. In the conventional fund sample, Goldstein et al. (2017) demonstrate that investors redeem more following negative performance under stressed market conditions. This behaviour may intensify the first-mover advantages as selling assets without accepting a discount might prove to be difficult during crisis periods. From a financial stability point of view, it is therefore interesting to analyse whether ESG/green funds are resilient during turmoils. In order to test this hypothesis, we define a stress period when the VIX level is above 90^{th} percentile of its distribution. In our sample, we have several such periods with March 2020 being the most significant market turmoil seen since the Global financial crisis of 2008. The regression to be tested will therefore take the following form:

$$\begin{aligned}
Flows_{i,t} &= \alpha + \beta_1 RetPosESG_{i,t-1}Crisis + \beta_2 RetPosESG_{i,t-1}Non-Crisis + \\
&+ \beta_3 RetPosNESG_{i,t-1}Crisis + \beta_4 RetPosNESG_{i,t-1}Non-Crisis + \\
&+ \beta_5 RetNegESG_{i,t-1}Crisis + \beta_6 RetNegESG_{i,t-1}Non-Crisis + \\
&+ \beta_7 RetNegNESG_{i,t-1}Crisis + \beta_8 RetNegNESG_{i,t-1}Non-Crisis + \\
&+ \beta_9 I(LaggedReturn<0)_{i,t-1} + \beta_{10} ESG + \beta_{11} Crisis_{i,t} + \\
&+ \beta_{12} I(LaggedReturn<0)_{i,t-1} \times ESG + \beta_{13} ESG \times Crisis + \\
&+ \beta_{14} I(LaggedReturn<0)_{i,t-1} \times Crisis_{i,t} + \\
&+ \beta_{15} I(LaggedReturn<0)_{i,t-1} \times ESG \times Crisis_{i,t} + \\
&+ \gamma Controls_{i,t} + \delta_i + \lambda_{ESG,t} + \epsilon_{i,t}, \qquad (2)
\end{aligned}$$

Table 3: The effect of share's clientele on the flow-performance relation of equity funds : ESG versus non-ESG peers
Specification using name classification and excess returns

	Equity funds			
	(1)	(2)	(3)	(4)
	Instit	Retail	Instit	Retail
	All ESG		Green ESG	
	Flows	Flows	Flows	Flows
Ret Pos ESG	0.075**	0.161***	0.101**	0.169***
	(2.35)	(3.74)	(2.05)	(3.33)
Ret Pos NESG	0.058***	0.067***	0.057***	0.067***
	(6.12)	(6.83)	(6.10)	(6.91)
Ret Neg ESG	0.017	0.015	0.076	0.074
	(0.33)	(0.28)	(1.05)	(1.11)
Ret Neg NESG	0.102***	0.067***	0.102***	0.066***
	(8.32)	(5.93)	(8.33)	(5.88)
I(Lagged Return<0)	-0.001**	-0.001***	-0.001**	-0.001***
	(-2.05)	(-2.85)	(-2.05)	(-2.83)
I(ESG) x I(Lagged Return<0)	-0.000	0.002	0.001	0.003*
	(-0.18)	(1.03)	(0.30)	(1.68)
Ln(age)	-0.008***	-0.016***	-0.008***	-0.016***
	(-6.80)	(-9.61)	(-6.52)	(-9.21)
Ln(size)	-0.010***	-0.009***	-0.010***	-0.009***
	(-19.11)	(-10.17)	(-18.72)	(-10.28)
Lagged Flows	0.143***	0.275***	0.144***	0.275***
	(28.77)	(27.77)	(28.04)	(27.30)
Std Dev Ret	-0.003***	-0.003***	-0.002***	-0.003***
	(-8.55)	(-10.06)	(-8.37)	(-10.14)
Constant	0.202***	0.195***	0.202***	0.197***
	(21.81)	(12.66)	(21.30)	(12.62)
Share FE	Yes	Yes	Yes	Yes
Month x ESG FE	Yes	Yes	Yes	Yes
Cluster	Share	Share	Share	Share
H0: Ret Neg ESG = Ret Neg NESG	0.092*	0.354	0.724	0.909
Adj. R^2	0.153	0.344	0.154	0.341
Observations	114 363	59 416	108 642	58 012
Sample	Name classification, Excess returns			

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

This table shows the flow-performance relationship for ESG and for non-ESG funds split by clientele. A share is considered as institutional if institutional investors detain more than 50% of its assets. A share is considered as retail if retail investors detain more than 50% of its assets. We regress share's flows on share's past excess returns. An asymmetry in investor response is tested with respect to past negative and positive performance. Moreover, we also test an asymmetry in investor response to past returns with respect to a share being considered an ESG or a conventional fund share. The following control variables are introduced: Ln(age) indicates the past natural logarithm of share's age (expressed in years), Ln(size) indicates the past natural logarithm of share's size, share's lagged flows and the standard deviation of the past 12 monthly returns. The sample covers January 2016 - December 2020 and is at a monthly frequency. ESG/E-funds are defined according to the use of certain words in funds' names. The first 2 columns show the results for all ESG funds (the Green ESG are considered instead of All ESG in the last 2 columns). Share fixed effects and crossed month and ESG fixed effects are introduced. Observations are clustered at a share level.

Table 4: The effect of share's clientele on the flow-performance relation of bond funds : ESG versus non-ESG peers
Specification using name classification and excess returns

	Bond funds			
	(1)	(2)	(3)	(4)
	Instit	Retail	Instit	Retail
	All ESG		Green ESG	
	Flows	Flows	Flows	Flows
Ret Pos ESG	-0.130	0.431	0.005	1.110***
	(-0.55)	(1.07)	(0.01)	(4.53)
Ret Pos NESG	0.024	0.191**	0.021	0.189**
	(0.42)	(2.52)	(0.36)	(2.50)
Ret Neg ESG	0.034	0.298	-0.415	0.671
	(0.12)	(0.87)	(-0.78)	(1.45)
Ret Neg NESG	0.124***	0.110*	0.126***	0.111*
	(2.60)	(1.82)	(2.64)	(1.84)
I(Lagged Return<0)	-0.002*	-0.001	-0.002*	-0.001
	(-1.78)	(-0.93)	(-1.82)	(-0.95)
I(ESG) x I(Lagged Return<0)	0.003	0.002	0.007	0.013*
	(0.62)	(0.25)	(0.77)	(1.91)
Ln(age)	-0.008**	-0.006	-0.008**	-0.004
	(-2.52)	(-1.15)	(-2.35)	(-0.72)
Ln(size)	-0.012***	-0.014***	-0.011***	-0.014***
	(-8.28)	(-5.22)	(-7.76)	(-4.99)
Lagged Flows	0.123***	0.252***	0.120***	0.250***
	(12.75)	(12.77)	(11.99)	(12.35)
Std Dev Ret	-0.002***	-0.008***	-0.002**	-0.008***
	(-2.67)	(-5.65)	(-2.53)	(-5.65)
Constant	0.235***	0.268***	0.228***	0.263***
	(9.10)	(5.44)	(8.49)	(5.14)
Share FE	Yes	Yes	Yes	Yes
Month x ESG FE	Yes	Yes	Yes	Yes
Cluster	Share	Share	Share	Share
H0: Ret Neg ESG = Ret Neg NESG	0.761	0.586	0.311	0.229
Adj. R^2	0.128	0.294	0.126	0.292
Observations	25 737	9 623	24 172	9 342
Sample	Name classification, Excess returns			

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

This table shows the flow-performance relationship for ESG and for non-ESG funds split by clientele. A share is considered as institutional if institutional investors detain more than 50% of its assets. A share is considered as retail if retail investors detain more than 50% of its assets. We regress share's flows on share's past excess returns. An asymmetry in investor response is tested with respect to past negative and positive performance. Moreover, we also test an asymmetry in investor response to past returns with respect to a share being considered an ESG or a conventional fund share. The following control variables are introduced: Ln(age) indicates the past natural logarithm of share's age (expressed in years), Ln(size) indicates the past natural logarithm of share's size, share's lagged flows and the standard deviation of the past 12 monthly returns. The sample covers January 2016 - December 2020 and is at a monthly frequency. ESG/E-funds are defined according to the use of certain words in funds' names. The first 2 columns show the results for all ESG funds (the Green ESG are considered instead of All ESG in the last 2 columns). Share fixed effects and crossed month and ESG fixed effects are introduced. Observations are clustered at a share level.

where the dependent variable represents the share's relative net flows between month t and t-1. The eight main independent variables account for non-linearities with respect to the share's past excess return levels and the market conditions: *RetPosESG Crisis* is the past positive return of ESG shares during crisis periods and 0 otherwise. *RetPosESG Non-Crisis* is the past positive return of ESG shares during normal periods and 0 otherwise. *RetPosNESG Crisis* is the past positive return of non-ESG shares during crisis periods and 0 otherwise. *RetPosNESG Non-Crisis* is the past positive return of non-ESG shares during normal periods and 0 otherwise. The four other return terms represent the cases where the past return was negative. *ESG* is an indicator variable equal to one if the fund is marketing itself as taking into account ESG criteria in its investment decisions and zero otherwise. $I(LaggedReturn < 0)$ is an indicator variable equal to one if the share displays a negative past excess performance and zero otherwise. Crisis is a dummy variable equal to one if the month's VIX level is above its 90^{th} percentile of its distribution and zero otherwise. The baseline coefficients of interest are based on a four-interaction term between the share's past return, the $I(LaggedReturn < 0)$ dummy, the *ESG* dummy and the $Crisis$ dummy. The reported results and t-statistics are based on selected sums of coefficients. Annex 1 (table 8) provides an explanation of how the eight coefficients of interest are constructed. Controls and fixed-effects are the same as in specification (2.1). Table 5 reports the results for both equity and corporate bond funds. For ease of visualisation we report only the coefficients related to negative returns. Our baseline result is confirmed: during periods of stress, flows into ESG/E-funds remain less sensitive to past negative performance in both bond and equity sample (indeed, the coefficient *Ret Neg ESG Crisis* is insignificant across all four specifications). In contrast, investors redeem following negative performances in conventional funds. As demonstrated by Goldstein et al. (2017), investors in bond funds redeem more in response to negative returns under stressed market conditions (in columns 3 and 4, *Ret Neg NESG Crisis* is highly positive and significant, while the coefficient *Ret Neg NESG Non-Crisis* is positive but insignificant). Regarding the equity conventional sample of funds, investors redeem following negative performances under both normal and stressed market conditions.

Table 5: The effect of crises periods on the flow-performance relation : ESG versus non-ESG peers
Specification using name classification and excess returns

	Equity funds		Bond funds	
	(1)	(2)	(3)	(4)
	All ESG	Green ESG	All ESG	Green ESG
	Flows	Flows	Flows	Flows
Ret Neg ESG Non-Crisis	0.020	0.052	0.254	-0.262
	(0.66)	(1.20)	(1.06)	(-0.97)
Ret Neg ESG Crisis	0.009	0.063	0.013	-0.012
	(0.21)	(1.04)	(0.07)	(-0.07)
Ret Neg NESG Non-Crisis	0.072***	0.072***	0.000	-0.000
	(8.92)	(8.89)	(0.00)	(-0.01)
Ret Neg NESG Crisis	0.065***	0.065***	0.112***	0.113***
	(6.81)	(6.79)	(3.33)	(3.35)
I(ESG) x I(Lagged Return<0)	0.000	0.001	0.003	0.006
	(0.23)	(0.70)	(0.93)	(1.14)
I(Lagged Return<0) x I(Crisis)	0.000	0.000	0.004**	0.004**
	(0.57)	(0.58)	(2.14)	(2.14)
I(ESG) x I(Crisis) I(Lagged Return<0)	-0.000	0.002	-0.002	-0.001
	(-0.03)	(0.60)	(-0.33)	(-0.12)
I(Lagged Return<0)	-0.001***	-0.001***	-0.002***	-0.002***
	(-4.23)	(-4.22)	(-3.65)	(-3.68)
Constant	0.193***	0.194***	0.263***	0.257***
	(33.95)	(33.18)	(15.75)	(14.86)
Share FE	Yes	Yes	Yes	Yes
Month x ESG FE	Yes	Yes	Yes	Yes
Cluster	Share	Share	Share	Share
Controls	Yes	Yes	Yes	Yes
H0: Ret Neg ESG Crisis = Ret Neg NESG Crisis	0.21	0.978	0.601	0.505
Adj. R^2	0.197	0.198	0.154	0.153
Observations	324 022	307 903	64 467	61 417
Sample	Name classification, Excess returns			

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

This table shows the effect of crisis periods on the flow-performance relationship for ESG and for non-ESG funds. We regress share's flows on share's past excess returns. An asymmetry in investor response is tested with respect to past negative and positive performance. Moreover, we also test an asymmetry in investor response to past returns with respect to a share being considered an ESG or a conventional fund share. We use an indicator variable in order to capture periods of crisis: I(Crisis) equals one if the VIX in the respective month is above its 90th percentile. For ease of visualisation, the terms related to the positive returns are not reported. The following control variables are introduced: Ln(age) indicates the past natural logarithm of share's age (expressed in years), Ln(size) indicates the past natural logarithm of share's size, share's lagged flows and the standard deviation of the past 12 monthly returns. The sample covers January 2016 - December 2020 and is at a monthly frequency. ESG/E-funds are defined according to the use of certain words in funds' names. The first 2 columns show the results for equity funds (the Green ESG are considered instead of All ESG in the second column), while the 2 last columns show the results for bond funds. Share fixed effects and crossed month and ESG fixed effects are introduced. Observations are clustered at a share level.

3.4 The effect of the liquidity of the portfolio

In this section we are interested in analysing whether investors remain insensitive to past negative performances in the ESG corporate bond funds with less liquid assets. Indeed, Goldstein et al. (2017) demonstrated that the first-mover advantage is larger in funds with less liquid assets. Therefore, investors will react stronger to past negative returns in such funds since the fund will need to potentially sell less liquid assets in order to reimburse redeeming investors which could lead to bigger losses in value.

The regression to be tested takes the following form:

$$\begin{aligned} Flows_{i,t} &= \alpha + \beta_1 RetPosESG_{i,t-1} Liq + \beta_2 RetPosESG_{i,t-1} Illiq + \\ &+ \beta_3 RetPosNESG_{i,t-1} Liq + \beta_4 RetPosNESG_{i,t-1} Illiq + \\ &+ \beta_5 RetNegESG_{i,t-1} Liq + \beta_6 RetNegESG_{i,t-1} Illiq + \\ &+ \beta_7 RetNegNESG_{i,t-1} Liq + \beta_8 RetNegNESG_{i,t-1} Illiq + \\ &+ \beta_9 I(LaggedReturn < 0)_{i,t-1} + \beta_{10} ESG + \beta_{11} Illiquid_{i,t-1} + \\ &+ \beta_{12} I(LaggedReturn < 0)_{i,t-1} \times ESG + \beta_{13} ESG \times Illiquid_{i,t-1} + \\ &+ \beta_{14} I(LaggedReturn < 0)_{i,t-1} \times Illiquid_{i,t-1} + \\ &+ \beta_{15} I(LaggedReturn < 0)_{i,t-1} \times ESG \times Illiquid_{i,t-1} + \\ &+ \gamma Controls_{i,t} + \delta_i + \lambda_{ESG,t} + \epsilon_{i,t}, \end{aligned} \tag{3}$$

where the dependent variable represents the share's relative net flows between month t and t-1. The eight main independent variables account for non-linearities with respect to the share's past excess return levels and the illiquidity of the fund's portfolio: *RetPosESG Liq* is the past positive return of ESG liquid shares and 0 otherwise. *RetPosESG Illiq* is the past positive return of ESG illiquid shares and 0 otherwise. *RetPosNESG Liq* is the past positive return of non-ESG liquid shares and 0 otherwise. *RetPosNESG Illiq* is the past positive return of non-ESG illiquid shares and 0 otherwise. The four other return terms represent the cases where the past return was negative. ESG is an indicator variable equal to one if the fund is marketing itself as taking into account ESG criteria in its investment decisions and zero otherwise. $I(LaggedReturn < 0)$ is an indicator variable equal to one if the share displays a negative past excess performance and zero otherwise. $Illiquid$ is an indicator variable that equals one if a fund is illiquid and zero

otherwise. We identify funds as illiquid if they hold less than 1% of their portfolio [9] in liquid assets[10]. The baseline coefficients of interest are based on a four-interaction term between the share's past return, the $I(LaggedReturn < 0)$ dummy, the ESG dummy and the $Illiquid$ dummy. The reported results and t-statistics are based on selected sums of coefficients. Annex 1 (table 9) provides an explanation of how the eight coefficients of interest are constructed. Controls and fixed-effects are the same as in specification (2.1).

Table 6 shows the results for the corporate bond sample. For ease of visualisation we report only the coefficients related to negative returns. We observe that our main result remains robust. ESG investors turn out to be less sensitive to past performance even in funds with less liquid assets (indeed, the coefficient *Ret Neg ESG Illiq* is positive and insignificant in column 1). However, we observe that when considering green ESG funds, the coefficient of the variable *Ret Neg ESG Illiq* is negative and highly significant. This finding suggests that in response to a more negative performance, investors reward illiquid shares with inflows. However, this counterintuitive finding is essentially explained by a small number of observations of illiquid green ESG funds with negative past returns occurring in April 2020, when the industry recorded inflows, while the lagged values of returns correspond to the turmoil period in March.

In contrast, in the conventional bond sample, we observe that investors in less liquid non-ESG funds are more sensitive to past negative performance compared to investors in more liquid conventional funds (indeed, the coefficient *Ret Neg NESG Illiq* is positive and highly significant and its size is almost the double of the coefficient *Ret Neg NESG Liq*). This finding is in line with the results of Goldstein et al. (2017) who demonstrate that investors are highly sensitive to negative returns in less liquid funds. Nevertheless, the difference in coefficients of past negative returns between illiquid ESG and non-ESG funds remains statistically insignificant.

3.5 Discussion

Our results suggest that investors in ESG and Environmental-focused funds are less sensitive to past negative performance, with no significant difference between retail and

[9] The threshold is defined as the 25 percentile of the distribution. Other thresholds are considered, namely the median or the 10th percentile and the results remain unchanged.

[10] The fund's liquidity measure displays the percentage of the portfolio invested in high quality assets, namely cash and cash equivalents, bonds from euro area governments, supranationals, central banks as well as non-euro area government bonds that have an AA/AAA rating.

Table 6: The effect of liquidity on the flow-performance relation: ESG versus non-ESG peers
Specification using name classification and excess returns

	(1)	(2)
	All ESG	Green ESG
	Flows	Flows
Ret Neg ESG Liq	0.185	-0.200
	(1.04)	(-1.45)
Ret Neg ESG Illiq	0.208	-1.067***
	(0.99)	(-3.64)
Ret Neg NESG Liq	0.081***	0.081***
	(2.62)	(2.62)
Ret Neg NESG Illiq	0.159***	0.159***
	(3.84)	(3.83)
I(Lagged Return<0)	-0.001	-0.001
	(-1.54)	(-1.57)
I(Illiquid)	-0.001	-0.001
	(-0.71)	(-0.71)
I(Lagged Return<0) x I(Illiquid)	0.001	0.001
	(0.41)	(0.41)
I(ESG) x I(Lagged Return<0)	0.003	0.004
	(0.99)	(0.78)
I(Illiquid) x I(ESG)	-0.005	-0.010
	(-1.26)	(-1.50)
I(ESG) x I(Illiquid) x I(Lagged Return<0)	-0.001	0.007
	(-0.22)	(1.22)
Constant	0.262***	0.255***
	(13.29)	(12.54)
Share FE	Yes	Yes
Month x ESG FE	Yes	Yes
Cluster	Share	Share
H0: Ret Neg ESG Illiq=Ret Neg NESG Illiq	0.819	0.000***
Adj. R^2	0.154	0.152
Observations	49 081	47 064
Sample	Name classification, Excess returns	

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

This table shows the effect of the liquidity on the flow-performance relationship for ESG and for non-ESG funds. We regress share's flows on share's past excess returns. An asymmetry in investor response is tested with respect to past negative and positive performance. Moreover, we also test an asymmetry in investor response to past returns with respect to a share being considered an ESG or a conventional fund share. We use an indicator variable in order to capture the fund's liquidity: I(illiquid) equals one if the fund invests less than 1% of its portfolio in liquid assets. For ease of visualisation, the terms related to the positive returns are not reported. The following control variables are introduced: past level of the portfolio invested in liquid assets, Ln(age) indicates the past natural logarithm of share's age (expressed in years), Ln(size) indicates the past natural logarithm of share's size, share's lagged flows and the standard deviation of the past 12 monthly returns. The sample covers January 2016 - December 2020 and is at a monthly frequency. ESG/E-funds are defined according to the use of certain words in funds' names. The 2 columns show the results for bond funds (the Green ESG are considered instead of All ESG in the second column). Share fixed effects and crossed month and ESG fixed effects are introduced. Observations are clustered at a share level.

institutional investors. The results are robust to alternative specifications. The lower sensitivity of ESG flows to negative returns is not explained by the recent growth trend in the ESG/E-fund sector, as we control for this trend by using time*ESG fixed effects. Also, investors in funds with an environmental objective remain less sensitive to negative returns in both calm and crisis times. Finally, the results are not explained by funds' liquidity: investors in ESG/E-funds with less liquid assets are still less sensitive to past negative returns.

However, in the bond fund sample, we find that the coefficients of the sensitivity to past negative returns for ESG and non-ESG funds are not statistically different. One possible explanation is that the ESG bond fund sample is relatively small or that ESG data suffer from greenwashing risk, due to the absence of clear standards for the identification of ESG funds. Indeed, ESG and non-ESG funds show similar performance over the considered period. But a quick glance at their portfolios suggests that their holdings do not differ significantly, at least, at a sectoral level. It is possible that ESG funds hold assets in firms with best-in-class ESG ratings, but this will be subject to future analysis. In the absence of clear and unique standards of what an ESG fund can hold, investors may not always be fully aware and certain of funds' commitments to their ethical goals. And this can affect investors' behavior as well.

4 Robustness

We have also tested different specifications of our four main hypotheses.

First, we test the robustness of our results with respect to the performance measure. In the literature there is no consensus regarding the best way to measure performance in the flow-performance relationship. Therefore, as an alternative definition, we employ past raw returns and unreported tables show that our results remain robust across specifications.

Second, we also pursued a piece-wise regression in order to offset a potential multi-collinearity problem across our regressors. Such a collinearity problem could arise due to the use of multiple interaction terms present for example in our hypotheses (indeed, hypothesis 4 presents a 4-term interaction term). We, therefore, run our main regressions without the interaction terms of all dummies variables present in the interaction term (therefore keeping only interaction terms with the past return present). Unreported results show that our results remain qualitatively unchanged.

Third, we used the Lipper classification (instead of the SHSS classification) in order to differentiate between retail and institutional shares. Lipper provides information about fund share class: if it institutional or retail. This classification is regularly used (e.g., in Goldstein et al. (2017)), however, it is known to have some bias as institutional shares are often identified by its size, e.g. above 100 000 euros. Annex 3 presents the results: table 12 and table 13 display the results for the sample of equity and bond funds respectively. Our results remain robust when using the Lipper classification for the equity fund sample. However, some differences appear in the results for the bond sample. The main coefficient of interest ($RetNegESG$) remains globally insignificant across the retail and institutional specifications, but the coefficient $RetNegNESG$ loses its significance in the institutional sample. This result suggests that institutional investors in conventional bond funds do not withdraw following past negative performance unlike retail investors. This result is somewhat aligned with Goldstein et al. (2017) who argue that institutional investors internalise the effect of the potential sell-off on the price. The difference is that Goldstein et al. (2017) look at the effect of clientele in the interaction with low-liquid bond markets or low liquidity of funds' holdings.

5 Conclusion and policy implications

ESG funds have been growing rapidly in recent years, reflecting the increasing awareness of climate change-related risk among investors and their interest in financing the transition towards a net-zero emission economy. But further growth may be inhibited if greenwashing concerns related to the classification of these funds are left unaddressed. The Covid-19 market turmoil provided a natural opportunity to test the resilience of the ESG fund flows to negative performance. In March 2020 ESG and environmental-focused funds have experienced lower outflows, and a more pronounced and faster recovery compared to conventional funds.

In this paper, we show that both retail and institutional investors in ESG and E-funds are less sensitive to past negative performance. This behaviour persists also in crisis periods and for corporate bond funds investing in less liquid assets, reflect a more stable and committed investor base. These findings are indicative of a higher resilience of flows in ESG and E-funds. A weaker flow-performance relationship of ESG and E-funds suggests that effective green finance can help to foster an orderly transition and reduce

vulnerability to climate-related risks. In addition, it is beneficial for financial stability, as ESG managers would not need to sell their assets in response to outflows in periods of market distress. However, the difference in the sensitivity to past negative performances between ESG/E funds and non-ESG peers is not statistically different in the bond fund sector, potentially due to the smaller sample of ESG/Environmental-focused funds or to the presence of a greenwashing risk.

It is challenging to decide which funds should be defined as ESG/E in the absense of a common definition and/or regulatory label. The overlap between ESG labels provided by different data providers such as Morningstar, Lipper and Bloomberg is limited. While not being part of our analysis, we acknowledge that it may be also confusing for investors to define an ESG/E fund. We argue that consistent, harmonized and verified ESG/E labels can help address uncertainty around definition of ESG/E funds, risks of greenwashing and misselling, thereby contributing to further growth of the ESG fund sector and funding of the transition to low-carbon economy. The development of ESG equity markets may be particularly valuable given that countries with a higher share of equity funding tend to reduce their carbon footprint more rapidly (De Haas and Popov (2019)).

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Annex 1

5.1 Table 1 coefficients

For ease of visualisation, we report in the baseline result table 1 interpretable coefficients related to the interaction term $Return_{i,t-1} \times I(LaggedReturn < 0) \times ESG$ (each possible outcome being considered). The following table displays how these different outcomes are built from the interaction term:

Table 7: Creation of the coefficients to be reported in the results table 1

Term	Formula
Ret Pos ESG	$Return_{i,t-1} + Return_{i,t-1} \times ESG$
Ret Pos NESG	$Return_{i,t-1}$
Ret Neg ESG	$Return_{i,t-1} + Return_{i,t-1} \times ESG$ $+Return_{i,t-1} \times I(LaggedReturn < 0)$ $+Return_{i,t-1} \times I(LaggedReturn < 0) \times ESG$
Ret Neg NESG	$Return_{i,t-1} + Return_{i,t-1} \times$ $I(LaggedReturn < 0)$

5.2 Table 5 coefficients

For ease of visualisation, we report in the result table 5 interpretable coefficients related to the interaction term $Return_{i,t-1} \times I(LaggedReturn < 0) \times ESG \times Crisis$ (each possible outcome being considered). The following table displays how these different outcomes are built from the interaction term:

Table 8: Creation of the coefficients to be reported in the results table 5

Term	Formula
Ret Pos ESG Crisis	$Return_{i,t-1} + Return_{i,t-1} \times ESG + Return_{i,t-1} \times Crisis + Return_{i,t-1} \times Crisis \times ESG$
Ret Pos ESG Non-Crisis	$Return_{i,t-1} + Return_{i,t-1} \times ESG$
Ret Neg ESG Crisis	$Return_{i,t-1} + Return_{i,t-1} \times I(LaggedReturn < 0) + Return_{i,t-1} \times I(LaggedReturn < 0) \times ESG + Return_{i,t-1} \times I(LaggedReturn < 0) \times ESG \times Crisis + Return_{i,t-1} \times ESG + Return_{i,t-1} \times Crisis + Return_{i,t-1} \times Crisis \times ESG + Return_{i,t-1} \times I(LaggedReturn < 0) \times Crisis$
Ret Neg ESG Non-Crisis	$Return_{i,t-1} + Return_{i,t-1} \times I(LaggedReturn < 0) + Return_{i,t-1} \times I(LaggedReturn < 0) \times ESG + Return_{i,t-1} \times ESG$
Ret Pos NESG Crisis	$Return_{i,t-1} + Return_{i,t-1} \times Crisis$
Ret Pos NESG Non-Crisis	$Return_{i,t-1}$
Ret Neg NESG Crisis	$Return_{i,t-1} + Return_{i,t-1} \times I(LaggedReturn < 0) + Return_{i,t-1} \times Crisis + Return_{i,t-1} \times I(LaggedReturn < 0) \times Crisis$
Ret Neg Nesg Non-Crisis	$Return_{i,t-1} + Return_{i,t-1} \times I(LaggedReturn < 0)$

5.3 Table 6 coefficients

For ease of visualisation, we report in the result table 6 interpretable coefficients related to the interaction term $Return_{i,t-1} \times I(LaggedReturn < 0) \times ESG \times Illiquid$ (each possible outcome being considered). The following table displays how these different outcomes are built from the interaction term:

Table 9: Creation of the coefficients to be reported in the results table 6

Term	Formula
Ret Pos ESG Illiq	$Return_{i,t-1} + Return_{i,t-1} \times ESG + Return_{i,t-1} \times Illiquid + Return_{i,t-1} \times Illiquid \times ESG$
Ret Pos ESG Liq	$Return_{i,t-1} + Return_{i,t-1} \times ESG$
Ret Neg ESG Illiq	$Return_{i,t-1} +_{i,t-1} \times I(LaggedReturn < 0) + Return_{i,t-1} \times I(LaggedReturn < 0) \times ESG + Return_{i,t-1} \times I(LaggedReturn < 0) \times ESG \times Illiquid + Return_{i,t-1} \times ESG + Return_{i,t-1} \times Illiquid + Return_{i,t-1} \times Illiquid \times ESG + Return_{i,t-1} \times I(LaggedReturn < 0) \times Illiquid$
Ret Neg ESG Liq	$Return_{i,t-1} + Return_{i,t-1} \times I(LaggedReturn < 0) + Return_{i,t-1} \times I(LaggedReturn < 0) \times ESG + Return_{i,t-1} \times ESG$
Ret Pos NESG Illiq	$Return_{i,t-1} + Return_{i,t-1} \times Illiquid$
Ret Pos NESG Liq	$Return_{i,t-1}$
Ret Neg NESG Illiq	$Return_{i,t-1} + Return_{i,t-1} \times I(LaggedReturn < 0) + Return_{i,t-1} \times Illiquid + Return_{i,t-1} \times I(LaggedReturn < 0) \times Illiquid$
Ret Neg Nesg Liq	$Return_{i,t-1} + Return_{i,t-1} \times I(LaggedReturn < 0)$

Annex 2

Table 10: The effect of European's clientele on the flow-performance relation of equity funds : ESG versus non-ESG peers
Specification using name classification and excess returns

	Equity funds			
	(1)	(2)	(3)	(4)
	EA	Non-EA	USD	EUR/GBP
	All ESG		All ESG	
	Flows	Flows	Flows	Flows
Ret Pos ESG	0.100***	0.056*	-0.006	0.073***
	(3.91)	(1.75)	(-0.12)	(3.61)
Ret Pos NESG	0.066***	0.042***	0.061***	0.054***
	(9.05)	(4.92)	(5.37)	(8.77)
Ret Neg ESG	0.023	-0.016	-0.014	0.015
	(0.61)	(-0.36)	(-0.23)	(0.49)
Ret Neg NESG	0.092***	0.049***	0.057***	0.082***
	(10.34)	(4.38)	(4.25)	(10.51)
I(Lagged Return<0)	-0.001***	-0.001***	-0.001*	-0.001***
	(-3.06)	(-3.17)	(-1.90)	(-4.45)
I(ESG) x I(Lagged Return<0)	0.000	-0.001	-0.002	0.001
	(0.41)	(-0.60)	(-0.87)	(0.86)
Ln(age)	-0.011***	-0.011***	-0.006***	-0.010***
	(-10.65)	(-7.53)	(-3.65)	(-11.61)
Ln(size)	-0.010***	-0.008***	-0.010***	-0.009***
	(-22.66)	(-14.72)	(-15.99)	(-24.00)
Lagged Flows	0.176***	0.170***	0.162***	0.171***
	(37.61)	(29.34)	(24.43)	(41.66)
Std Dev Ret	-0.003***	-0.002***	-0.003***	-0.002***
	(-12.28)	(-8.46)	(-7.91)	(-11.73)
Constant	0.204***	0.170***	0.193***	0.191***
	(26.19)	(17.38)	(17.51)	(27.64)
Share FE	Yes	Yes	Yes	Yes
Month x ESG FE	Yes	Yes	Yes	Yes
Cluster	Share	Share	Share	Share
H0: Ret Neg ESG = Ret Neg NESG	0.077*	0.148	0.254	0.029*
Adj. R^2	0.2	0.2	0.19	0.19
Observations	172 244	104 314	71 428	231 078
Sample	Lipper classification, Excess returns			

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

This table shows the flow-performance relationship for ESG and for non-ESG funds split by European or non-European clientele. A share is considered as having an European (non-European) clientele if at least 75% (less than 75%) of its assets are detained by European clients. We regress share's flows on share's past excess returns. An asymmetry in investor response is tested with respect to past negative and positive performance. Moreover, we also test an asymmetry in investor response to past returns with respect to a share being considered an ESG or a conventional fund share. The following control variables are introduced: Ln(age) indicates the past natural logarithm of share's age (expressed in years), Ln(size) indicates the past natural logarithm of share's size, share's lagged flows and the standard deviation of the past 12 monthly returns. The sample covers January 2016 - December 2020 and is at a monthly frequency. ESG/E-funds are defined according to the use of certain words in funds' names. The first 2 columns show the results split between European and non-European clientele, while in the last 2 columns we use the currency denomination of the share as a proxy for the geographical split by clientele. Share fixed effects and crossed month and ESG fixed effects are introduced. Observations are clustered at a share level.

Table 11: The effect of European's clientele on the flow-performance relation of bond funds : ESG versus non-ESG peers
Specification using name classification and excess returns

	Bond funds			
	(1)	(2)	(3)	(4)
	EA	Non-EA	USD	EUR/GBP
	All ESG		All ESG	
	Flows	Flows	Flows	Flows
Ret Pos ESG	0.128	-0.538**	-0.606	0.050
	(0.55)	(-2.29)	(-0.98)	(0.24)
Ret Pos NESG	0.056	-0.001	-0.003	0.117***
	(1.14)	(-0.02)	(-0.03)	(2.83)
Ret Neg ESG	0.107	0.042	1.699**	0.076
	(0.42)	(0.27)	(2.39)	(0.30)
Ret Neg NESG	0.105**	0.128***	0.238***	0.076*
	(2.50)	(3.32)	(3.76)	(1.76)
I(Lagged Return<0)	-0.002***	-0.000	-0.003	-0.004***
	(-2.85)	(-0.16)	(-1.62)	(-5.04)
I(ESG) x I(Lagged Return<0)	0.001	0.003	0.017	0.001
	(0.22)	(0.49)	(1.35)	(0.35)
Ln(age)	-0.009***	-0.006	-0.007	-0.008***
	(-3.02)	(-1.60)	(-1.23)	(-3.26)
Ln(size)	-0.012***	-0.017***	-0.014***	-0.014***
	(-9.33)	(-11.11)	(-8.13)	(-11.35)
Lagged Flows	0.153***	0.147***	0.140***	0.153***
	(16.78)	(11.63)	(8.20)	(19.81)
Std Dev Ret	-0.003***	-0.004***	-0.005***	-0.003***
	(-3.85)	(-5.04)	(-4.25)	(-3.78)
Constant	0.238***	0.313***	0.272***	0.263***
	(10.27)	(11.70)	(8.90)	(12.27)
Share FE	Yes	Yes	Yes	Yes
Month x ESG FE	Yes	Yes	Yes	Yes
Cluster	Share	Share	Share	Share
H0: Ret Neg ESG = Ret Neg NESG	0.995	0.595	0.042**	0.998
Adj. R^2	0.16	0.16	0.14	0.16
Observations	33 526	23 092	13 107	44 608
Sample	Lipper classification, Excess returns			

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

This table shows the flow-performance relationship for ESG and for non-ESG funds split by European or non-European clientele. A share is considered as having an European (non-European) clientele if at least 75% (less than 75%) of its assets are detained by European clients. We regress share's flows on share's past excess returns. An asymmetry in investor response is tested with respect to past negative and positive performance. Moreover, we also test an asymmetry in investor response to past returns with respect to a share being considered an ESG or a conventional fund share. The following control variables are introduced: Ln(age) indicates the past natural logarithm of share's age (expressed in years), Ln(size) indicates the past natural logarithm of share's size, share's lagged flows and the standard deviation of the past 12 monthly returns. The sample covers January 2016 - December 2020 and is at a monthly frequency. ESG/E-funds are defined according to the use of certain words in funds' names. The first 2 columns show the results split between European and non-European clientele, while in the last 2 columns we use the currency denomination of the share as a proxy for the geographical split by clientele. Share fixed effects and crossed month and ESG fixed effects are introduced. Observations are clustered at a share level.

Annex 3

Table 12: The effect of share's clientele on the flow-performance relation of equity funds: ESG versus non-ESG peers
Specification using Lipper classification and excess returns

	Equity funds			
	(1)	(2)	(3)	(4)
	Instit	Retail	Instit	Retail
	All ESG		Green ESG	
	Flows	Flows	Flows	Flows
Ret Pos ESG	0.054*	0.064***	0.092*	0.100***
	(1.80)	(2.98)	(1.91)	(3.24)
Ret Pos NESG	0.044***	0.054***	0.044***	0.054***
	(4.30)	(9.36)	(4.27)	(9.44)
Ret Neg ESG	0.036	0.004	0.033	0.067
	(0.72)	(0.14)	(0.44)	(1.58)
Ret Neg NESG	0.093***	0.059***	0.093***	0.059***
	(6.92)	(8.23)	(6.93)	(8.17)
I(Lagged Return<0)	-0.000	-0.001***	-0.000	-0.001***
	(-0.71)	(-5.26)	(-0.71)	(-5.23)
I(ESG) x I(Lagged Return<0)	0.001	-0.000	0.001	0.001
	(0.64)	(-0.05)	(0.59)	(1.07)
Ln(age)	-0.004***	-0.011***	-0.005***	-0.011***
	(-2.94)	(-12.96)	(-3.05)	(-12.46)
Ln(size)	-0.010***	-0.009***	-0.010***	-0.009***
	(-19.63)	(-22.73)	(-19.23)	(-22.23)
Lagged Flows	0.126***	0.194***	0.128***	0.195***
	(23.82)	(44.86)	(23.47)	(43.93)
Std Dev Ret	-0.002***	-0.002***	-0.002***	-0.003***
	(-6.61)	(-13.41)	(-6.41)	(-13.46)
Constant	0.203***	0.187***	0.202***	0.189***
	(20.85)	(26.92)	(20.31)	(26.32)
Share FE	Yes	Yes	Yes	Yes
Month x ESG FE	Yes	Yes	Yes	Yes
Cluster	Share	Share	Share	Share
H0: Ret Neg ESG = Ret Neg NESG	0.28	0.075*	0.43	0.857
Adj. R^2	0.13	0.23	0.13	0.23
Observations	94 047	229 975	88 216	219 687
Sample	Lipper classification, Excess returns			

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

This table shows the flow-performance relationship for ESG and for non-ESG funds split by clientele. A share is considered as institutional based on the Lipper classification. We regress share's flows on share's past excess returns. An asymmetry in investor response is tested with respect to past negative and positive performance. Moreover, we also test an asymmetry in investor response to past returns with respect to a share being considered an ESG or a conventional fund share. The following control variables are introduced: Ln(age) indicates the past natural logarithm of share's age (expressed in years), Ln(size) indicates the past natural logarithm of share's size, share's lagged flows and the standard deviation of the past 12 monthly returns. The sample covers January 2016 - December 2020 and is at a monthly frequency. ESG/E-funds are defined according to the use of certain words in funds' names. The first 2 columns show the results for all ESG funds (the Green ESG are considered instead of All ESG in the last 2 columns). Share fixed effects and crossed month and ESG fixed effects are introduced. Observations are clustered at a share level.

Table 13: The effect of share's clientele on the flow-performance relation of bond funds : ESG versus non-ESG peers
Specification using Lipper classification and excess returns

	Bond funds			
	(1)	(2)	(3)	(4)
	Instit	Retail	Instit	Retail
	All ESG		Green ESG	
	Flows	Flows	Flows	Flows
Ret Pos ESG	-0.235	-0.058	0.060	-0.126
	(-0.98)	(-0.34)	(0.19)	(-0.43)
Ret Pos NESG	0.020	0.025	0.018	0.025
	(0.45)	(0.65)	(0.41)	(0.66)
Ret Neg ESG	-0.117	0.480*	-0.277	0.288
	(-0.71)	(1.80)	(-1.52)	(1.06)
Ret Neg NESG	0.061	0.093***	0.062	0.093***
	(1.33)	(3.02)	(1.35)	(3.00)
I(Lagged Return<0)	-0.000	-0.002**	-0.000	-0.002**
	(-0.30)	(-2.34)	(-0.31)	(-2.35)
I(ESG) x I(Lagged Return<0)	0.001	0.002	0.006	0.005
	(0.16)	(0.63)	(0.70)	(1.37)
Ln(age)	-0.008**	-0.008***	-0.009**	-0.007**
	(-2.54)	(-2.69)	(-2.54)	(-2.28)
Ln(size)	-0.013***	-0.014***	-0.013***	-0.014***
	(-9.29)	(-11.43)	(-8.70)	(-10.94)
Lagged Flows	0.126***	0.173***	0.123***	0.172***
	(13.06)	(17.60)	(12.31)	(16.98)
Std Dev Ret	-0.002**	-0.005***	-0.002**	-0.005***
	(-2.15)	(-6.67)	(-2.00)	(-6.72)
Constant	0.254***	0.274***	0.247***	0.268***
	(10.09)	(12.25)	(9.45)	(11.67)
Share FE	Yes	Yes	Yes	Yes
Month x ESG FE	Yes	Yes	Yes	Yes
Cluster	Share	Share	Share	Share
H0: Ret Neg ESG = Ret Neg NESG	0.3	0.15	0.071*	0.475
Adj. R^2	0.12	0.17	0.12	0.17
Observations	24 526	39 941	23 153	38 264
Sample	Lipper classification, Excess returns			

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

This table shows the flow-performance relationship for ESG and for non-ESG funds split by clientele. A share is considered as institutional based on the Lipper classification. We regress share's flows on share's past excess returns. An asymmetry in investor response is tested with respect to past negative and positive performance. Moreover, we also test an asymmetry in investor response to past returns with respect to a share being considered an ESG or a conventional fund share. The following control variables are introduced: Ln(age) indicates the past natural logarithm of share's age (expressed in years), Ln(size) indicates the past natural logarithm of share's size, share's lagged flows and the standard deviation of the past 12 monthly returns. The sample covers January 2016 - December 2020 and is at a monthly frequency. ESG/E-funds are defined according to the use of certain words in funds' names. The first 2 columns show the results for all ESG funds (the Green ESG are considered instead of All ESG in the last 2 columns). Share fixed effects and crossed month and ESG fixed effects are introduced. Observations are clustered at a share level.

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