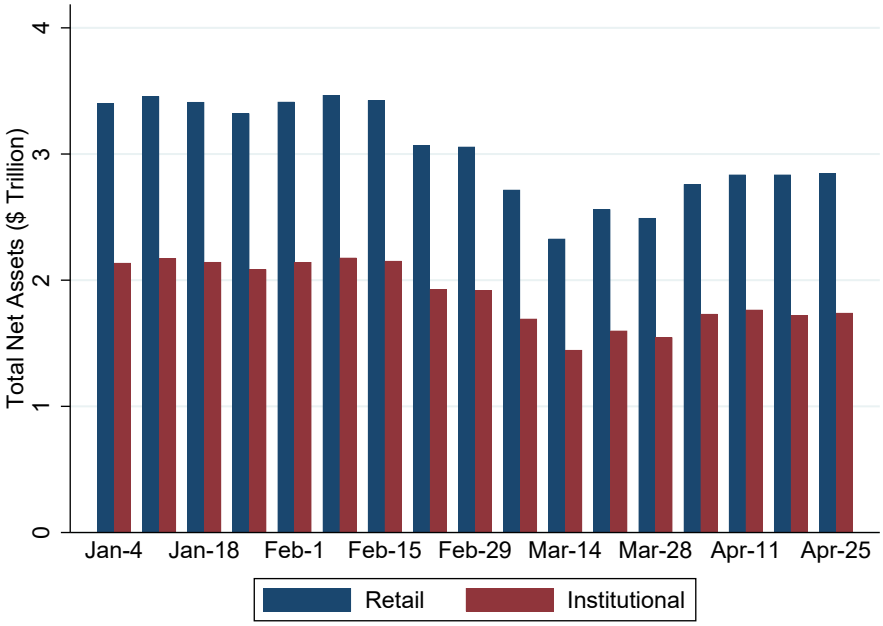
Internet Appendix

A.I Additional Figures and Tables

Figure A.1. Retail and Institutional Fund Flows and Net Assets

These figures plot weekly aggregate total net assets and dollar net flows of retail and institutional funds over the sample period from January 4 to April 25, 2020.

a. Total Net Assets



b. Dollar Net Flow

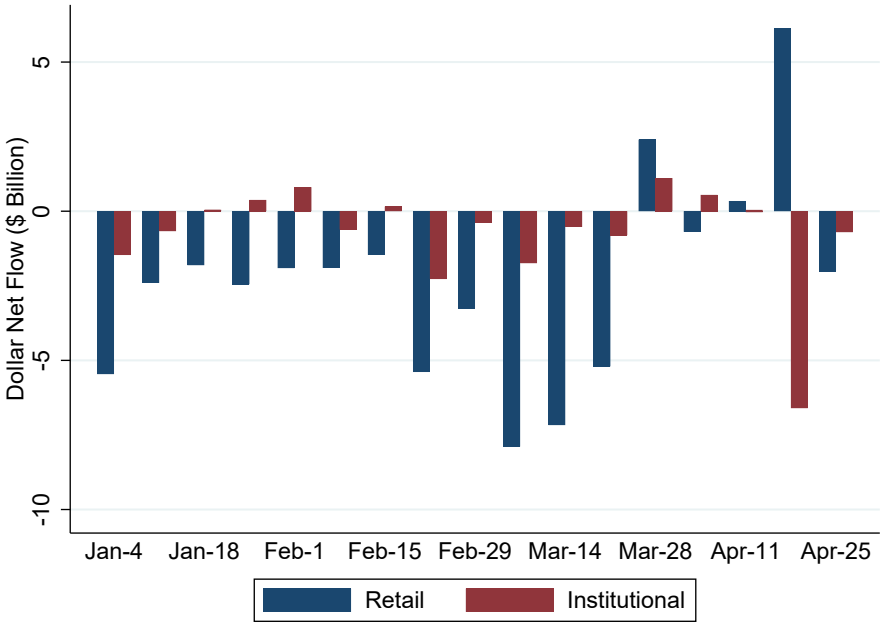
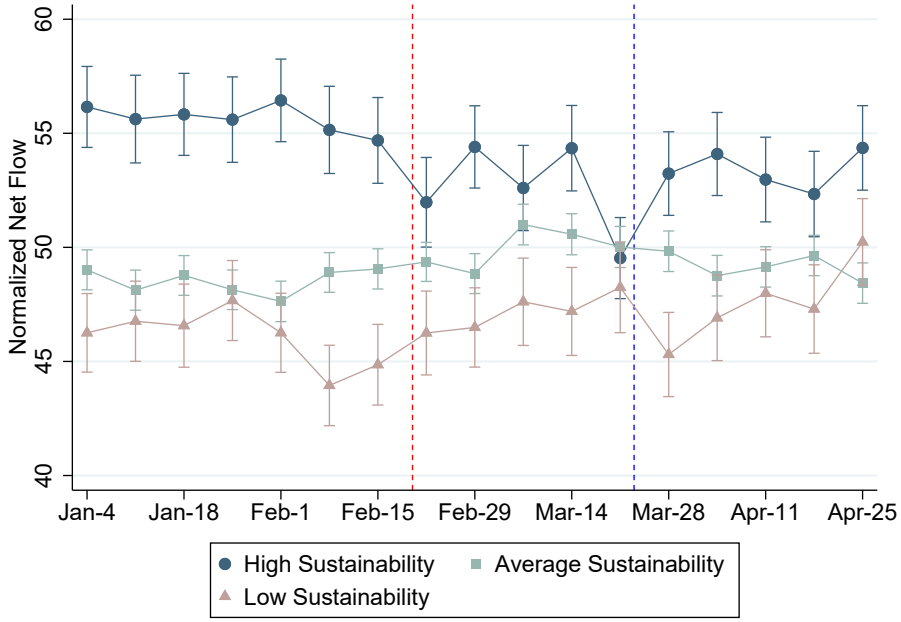


Figure A.2. Weekly Average Pooled Fund Flows by Sustainability Rating

For the pooled sample of funds consisting of both retail and institutional share classes, these figures plot the average weekly net flows of high (five globes), average (three globes), and low (one globe) sustainability funds, along with their mean standard error bands, over the sample period from January 4 to April 25, 2020. Morningstar sustainability ratings as of December, 2019 are used to sort funds. The red and blue vertical dotted lines denote the dates February 20, 2020 (beginning of the market crash) and March 23, 2020 (stimulus approval date), respectively. Plots are shown for normalized net flows and raw net flows.

a. Normalized Net Flow



b. Raw Net Flow

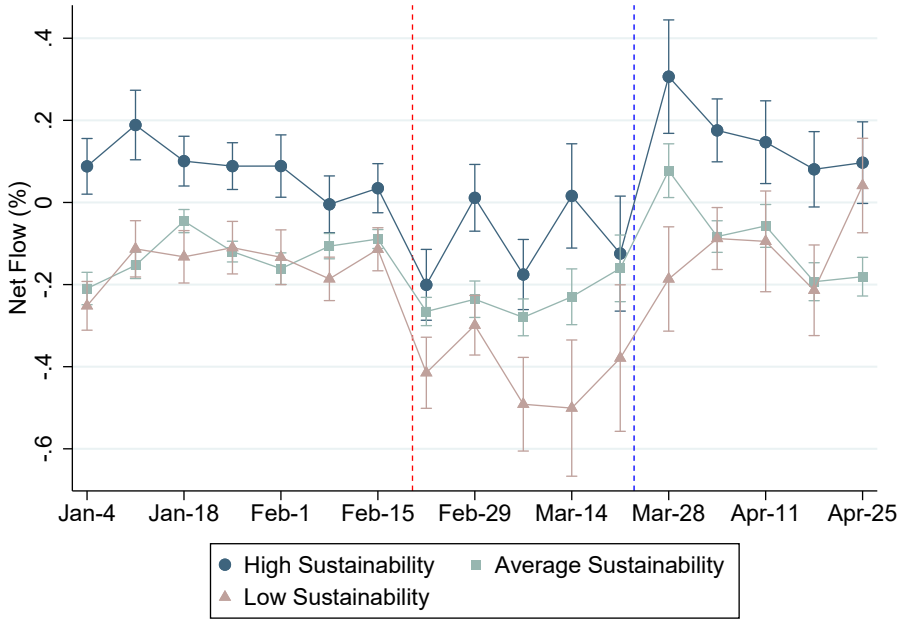


Figure A.3. Parallel Trends (Retail vs. Institutional)

This figure plots coefficients along with their 95% confidence intervals from an augmented triple-difference version of Equation 2 further interacted with RETAIL_i, run on the pooled sample of retail and institutional share classes. The plotted coefficients are the slopes on the interaction terms between the weekly dummy variables, $d[T+k]_t$, indicating whether the fund-week observation is k weeks from the week ending February 22, 2020, and the $d[g=5]$ and RETAIL indicator variables, describing the differential dynamics of the high vs. low ESG fund flow gap for retail funds relative to institutional funds, from six weeks prior to nine weeks after the onset of the crisis. The dummy for the first week of the sample and the dummy for the group of funds with a 1 globe rating are omitted. The baseline control variables as well as fund category, vintage year, and sustainability rating fixed effects are included in the regression.

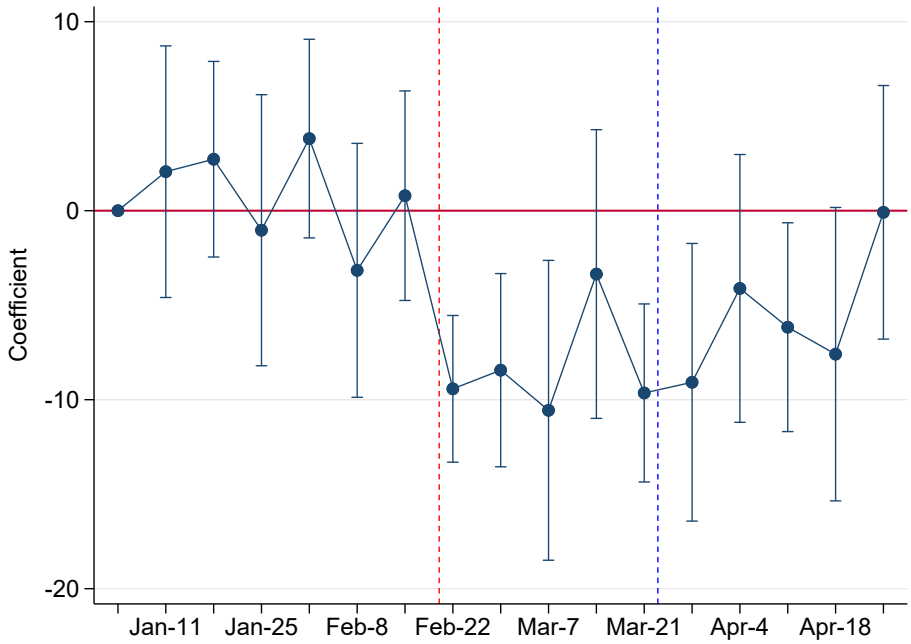
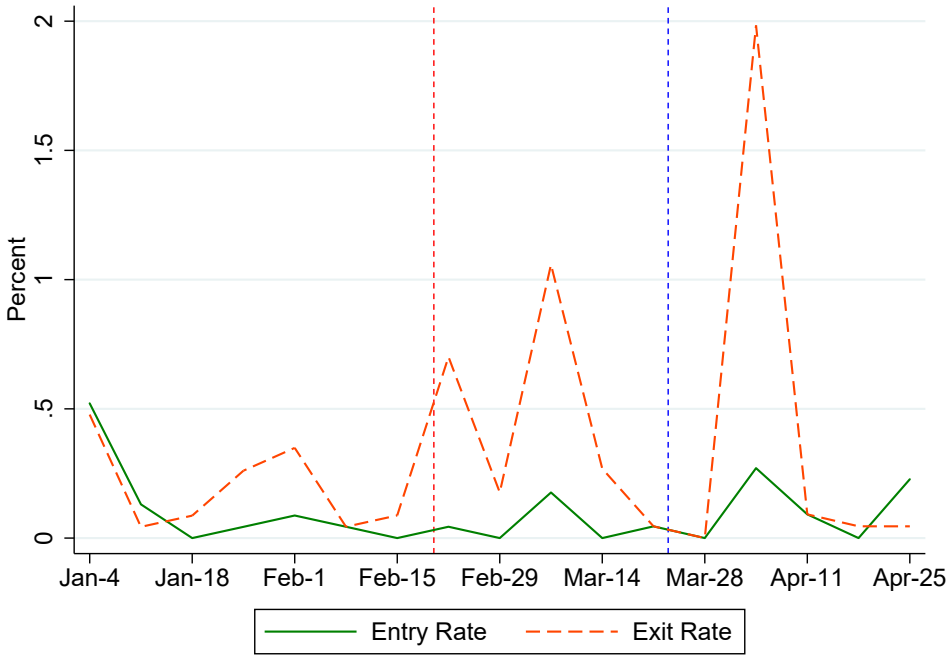


Figure A.4. Increased Competition from New ESG Fund Entrants?

These figures plot the weekly rate of fund entry and exit computed as the number of funds that newly enter the sample or cease to exist as a ratio of the number of existing funds (above), and the weekly number of high and low ESG funds according to their Morningstar sustainability ratings (below).

a. Entry and Exit Rates



b. Number of High and Low ESG Funds

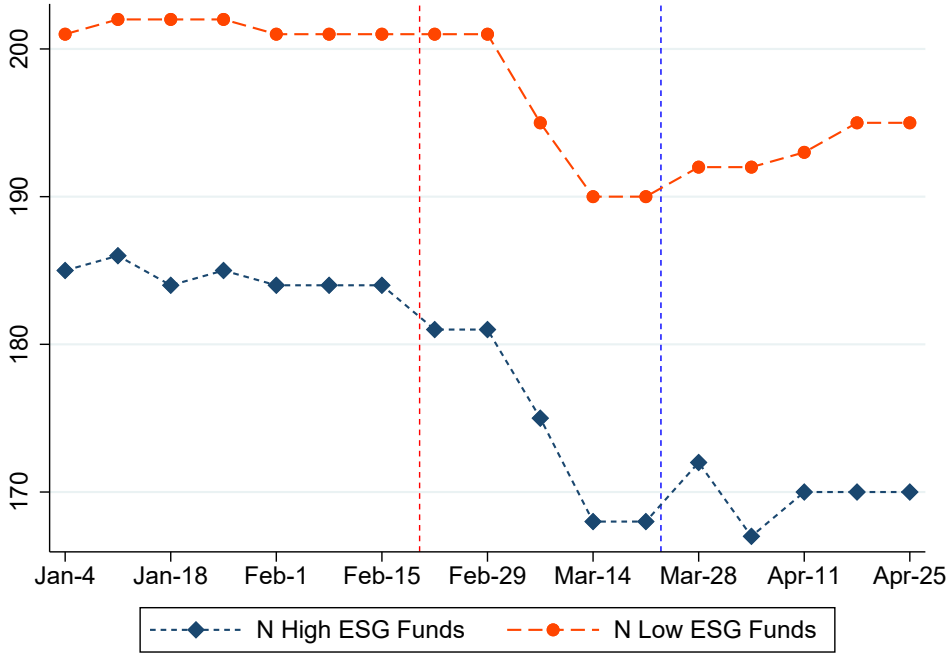


Table A.1. Parallel Trends

This table presents results from the following regression.

$$\text{NORM\_FLOW}_{i,t} = \sum_{k=-6}^{+9} \sum_{g=2}^{5} \beta_{g,k} \cdot d[g]_i \times d[T+k]_t + \gamma' \cdot X_{i,t} + \mu_j + \eta_y + \theta_g + \omega_t + \epsilon_{i,t}$$

The dependent variable is normalized net flow (NORM_FLOW), and $d[T+k]_t$ denote dummy variables indicating whether the observation is k weeks from the week ending February 22, 2020. The dummy for the first week of the sample is omitted. $d[g]_i$ denote dummy variables indicating whether the fund is assigned a g globe rating by Morningstar, where g ranges from two to five. The dummy for the group of funds with a 1 globe rating is omitted. The baseline control variables as well as fund category, vintage year, and sustainability rating fixed effects are included in the regression. The reported coefficients in Column (1) are the slopes on the weekly dummies interacted with the $d[g=5]$ indicator variable, describing the dynamics of high ESG fund flows relative to the omitted low ESG fund flows from six weeks prior to nine weeks after the onset of the crisis. The coefficients in Column (2) are from an augmented triple-difference version of the regression further interacted with RETAIL_i, run on the pooled sample of retail and institutional funds. Standard errors are adjusted for clustering at fund and category levels (*** p<0.01, ** p<0.05, * p<0.1).

	Dependent Variable: NORM_FLOW	
	Retail Fund Sample ($d[g=5] \times d[T+k]$)	Pooled Sample ($d[g=5] \times \text{RETAIL} \times d[T+k]$)
	1	2
$d[T-6]$	-0.641	2.064
	(2.154)	(3.140)
$d[T-5]$	0.657	2.723
	(1.460)	(2.441)
$d[T-4]$	-3.513	-1.033
	(2.863)	(3.383)
$d[T-3]$	2.641	3.816
	(1.631)	(2.479)
$d[T-2]$	-3.085	-3.156
	(1.892)	(3.169)
$d[T-1]$	-1.945	0.793
	(1.310)	(2.615)
$d[T]$	-10.584***	-9.425***
	(1.493)	(1.831)
$d[T+1]$	-9.677***	-8.439***
	(1.034)	(2.411)
$d[T+2]$	-11.197***	-10.562**
	(2.211)	(3.742)
$d[T+3]$	-5.433***	-3.352
	(1.750)	(3.603)
$d[T+4]$	-13.602***	-9.644***
	(1.787)	(2.222)
$d[T+5]$	-10.546***	-9.079**
	(1.950)	(3.464)
$d[T+6]$	-9.732***	-4.112
	(2.238)	(3.342)
$d[T+7]$	-11.480***	-6.164**
	(1.613)	(2.606)
$d[T+8]$	-11.862***	-7.591*
	(2.758)	(3.662)
$d[T+9]$	-9.774***	-0.086
	(1.994)	(3.165)
Observations	37,654	72,087
Category FE	Y	Y
Vintage FE	Y	Y
Sustainability Rating FE	Y	Y
Week FE	Y	Y
Controls / Interactions	Y	Y
Adj R^2	0.0653	0.0538

Table A.2. Fund ESG Ratings and Fund Flows

This table presents results from fund-week level OLS regressions of net flows on HIGH_ESG, ABOVE_AVG_ESG, BELOW_AVG_ESG, and LOW_ESG − dummy variables indicating whether a fund had a high, above average, below average, or low Morningstar sustainability rating as of December, 2019. Results are shown for normalized net flows (NORM_FLOW) and raw net flows (RAW_FLOW) as the dependent variable, and for pre-COVID and post-COVID sub-periods. Control variables include prior month's return, log of total net assets, expense ratio, dummies for star rating upgrades and downgrades, as well as category-by-week and vintage-by-week fixed effects. Standard errors are adjusted for clustering at fund and category-by-week levels (*** p<0.01, ** p<0.05, * p<0.1).

	Dependent Variable: NORM_FLOW				Dependent Variable: RAW_FLOW			
	Pre-COVID		Post-COVID		Pre-COVID		Post-COVID	
	Long Sample Nov2 − Feb15	Main Sample Jan4 − Feb15	Crash Feb22 − Mar21	Stimulus Mar28 − Apr25	Long Sample Nov2 − Feb15	Main Sample Jan4 − Feb15	Crash Feb22 − Mar21	Stimulus Mar28 − Apr25
	1	2	3	4	5	6	7	8
HIGH_ESG	3.082**	3.876**	-2.526	-3.047*	0.107**	0.163***	-0.041	-0.049
	(1.452)	(1.737)	(1.684)	(1.686)	(0.041)	(0.047)	(0.074)	(0.077)
ABOVE_AVG_ESG	2.225**	2.991**	-0.657	-0.387	0.035	0.079**	-0.048	-0.032
	(0.985)	(1.166)	(1.139)	(1.133)	(0.029)	(0.032)	(0.056)	(0.047)
BELOW_AVG_ESG	0.348	1.180	1.065	1.162	-0.010	0.039	0.054	0.096**
	(0.934)	(1.061)	(1.093)	(1.106)	(0.026)	(0.029)	(0.051)	(0.048)
LOW_ESG	-3.472**	-1.608	-0.083	1.605	-0.089**	0.005	0.021	0.172*
	(1.348)	(1.468)	(1.647)	(1.870)	(0.040)	(0.041)	(0.092)	(0.089)
RET	1.386***	1.528***	0.002	1.301***	0.038***	0.038***	0.011	0.040***
	(0.191)	(0.242)	(0.299)	(0.197)	(0.006)	(0.008)	(0.013)	(0.008)
log(TNA)	0.808***	0.870***	0.487	0.202	0.019***	0.025***	0.062***	0.040***
	(0.256)	(0.316)	(0.314)	(0.350)	(0.007)	(0.008)	(0.013)	(0.013)
EXPENSE_RATIO	-2.199***	-2.239***	-1.467	-1.825*	-0.001	-0.004	-0.006	-0.039
	(0.669)	(0.809)	(0.942)	(0.979)	(0.024)	(0.026)	(0.046)	(0.037)
STAR_UP	-0.282	1.045	0.703	-2.741**	0.055	0.069**	-0.019	-0.078
	(0.898)	(1.343)	(1.460)	(1.312)	(0.035)	(0.033)	(0.071)	(0.056)
STAR_DOWN	0.326	-0.957	-2.827*	-0.618	0.037	-0.004	-0.083	-0.047
	(0.970)	(1.297)	(1.469)	(1.589)	(0.030)	(0.035)	(0.067)	(0.052)
Observations	35,870	15,850	11,011	10,793	35,870	15,850	11,011	10,793
Category-by-Week FE	Y	Y	Y	Y	Y	Y	Y	Y
Vintage-by-Week FE	Y	Y	Y	Y	Y	Y	Y	Y
Adj R^2	0.0709	0.0885	0.0694	0.0631	0.0339	0.0574	0.0431	0.0384

Table A.3. Fund Flows Around COVID-19

This table presents results from fund-week level OLS regressions of net flows on dummy variables indicating the post-COVID period starting in the week ending February 22, 2020. Regressions are run for the full sample, as well as separately for subsamples of funds in each Morningstar sustainability rating group. Results are shown for normalized net flows (NORM_FLOW) and raw net flows (RAW_FLOW) as the dependent variable. In Panel A, a single COVID indicator is used, whereas in Panel B, the COVID period is broken into two sub-periods: The market crash period from February 22 to March 21, 2020 (COVID_CRASH) and stimulus period from March 28 to April 25, 2020 (COVID_STIMULUS). Control variables include prior month's return, log of total net assets, expense ratio, dummies for star rating upgrades and downgrades, as well as category and vintage fixed effects. Standard errors are adjusted for clustering at fund and category-by-week levels (*** p<0.01, ** p<0.05, * p<0.1).

Panel A. Before and After COVID-19

	Dependent Variable: RAW_FLOW						Dependent Variable: NORM_FLOW				
	All Funds	High	Above Average	Average	Below Average	Low	High	Above Average	Average	Below Average	Low
	1	2	3	4	5	6	7	8	9	10	11
COVID	-0.220***	-0.362***	-0.316***	-0.185***	-0.179***	-0.158**	-3.014*	-1.310	2.337***	2.490**	5.396***
	(0.032)	(0.072)	(0.054)	(0.041)	(0.054)	(0.073)	(1.556)	(1.008)	(0.901)	(1.055)	(1.475)
RET	-0.010***	-0.011**	-0.012***	-0.010***	-0.012***	-0.007	0.136	0.064	0.100	0.116	0.206*
	(0.002)	(0.005)	(0.003)	(0.003)	(0.003)	(0.004)	(0.111)	(0.072)	(0.064)	(0.076)	(0.105)
log(TNA)	0.042***	0.078**	0.046**	0.034***	0.060***	-0.044	1.226	1.177*	0.463	1.323***	-1.220
	(0.008)	(0.032)	(0.020)	(0.012)	(0.015)	(0.042)	(0.936)	(0.626)	(0.421)	(0.468)	(1.050)
EXPENSE_RATIO	-0.006	0.407***	-0.033	-0.033	-0.075*	-0.243***	8.760***	-0.877	-2.508*	-3.791***	-5.591**
	(0.026)	(0.110)	(0.071)	(0.040)	(0.043)	(0.088)	(2.994)	(1.814)	(1.278)	(1.292)	(2.387)
STAR_UP	0.067**	-0.000	0.084	0.079	-0.094	0.339***	-1.729	1.117	-0.002	-0.140	3.921
	(0.033)	(0.086)	(0.065)	(0.051)	(0.080)	(0.103)	(2.514)	(1.586)	(1.363)	(1.882)	(2.421)
STAR_DOWN	-0.112***	-0.241***	-0.035	-0.111*	-0.161***	0.075	-5.872**	-2.247	-2.712*	-4.006**	-0.305
	(0.032)	(0.083)	(0.080)	(0.065)	(0.054)	(0.093)	(2.709)	(2.214)	(1.599)	(1.588)	(2.447)
Observations	38,033	3,337	8,463	14,163	8,962	3,014	3,337	8,463	14,163	8,962	3,014
Category FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Vintage FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Adj R^2	0.0321	0.0874	0.0504	0.0249	0.0514	0.0954	0.142	0.0785	0.0733	0.0902	0.156

Table A.3. Fund Flows Around COVID-19 (continued)

Panel B. Before COVID-19, During the Crash, and During the Stimulus

	Dependent Variable: RAW_FLOW						Dependent Variable: NORM_FLOW				
	All Funds	High	Above Average	Average	Below Average	Low	High	Above Average	Average	Below Average	Low
	1	2	3	4	5	6	7	8	9	10	11
COVID_CRASH	-0.214***	-0.344***	-0.303***	-0.170***	-0.171***	-0.166**	-2.861*	-1.233	2.410***	2.531**	5.358***
	(0.029)	(0.072)	(0.053)	(0.038)	(0.051)	(0.072)	(1.575)	(1.024)	(0.909)	(1.058)	(1.488)
COVID_STIMULUS	0.213***	0.084	0.113*	0.252***	0.236***	0.358***	0.753	1.134	4.371***	4.431***	7.673***
	(0.041)	(0.130)	(0.066)	(0.064)	(0.064)	(0.102)	(2.713)	(1.569)	(1.454)	(1.693)	(2.364)
RET	0.009***	0.012	0.009**	0.010***	0.005	0.014***	0.327**	0.184*	0.193**	0.199**	0.297**
	(0.002)	(0.007)	(0.004)	(0.004)	(0.004)	(0.005)	(0.162)	(0.097)	(0.087)	(0.100)	(0.128)
log(TNA)	0.040***	0.077**	0.043**	0.033***	0.058***	-0.046	1.220	1.163*	0.460	1.316***	-1.229
	(0.008)	(0.032)	(0.020)	(0.011)	(0.015)	(0.042)	(0.935)	(0.625)	(0.421)	(0.467)	(1.047)
EXPENSE_RATIO	-0.009	0.404***	-0.038	-0.031	-0.077*	-0.249***	8.737***	-0.905	-2.497*	-3.800***	-5.615**
	(0.026)	(0.109)	(0.070)	(0.039)	(0.043)	(0.088)	(2.987)	(1.813)	(1.272)	(1.291)	(2.383)
STAR_UP	0.024	-0.059	0.045	0.036	-0.123	0.291***	-2.223	0.899	-0.202	-0.272	3.711
	(0.033)	(0.089)	(0.065)	(0.051)	(0.079)	(0.096)	(2.575)	(1.602)	(1.353)	(1.890)	(2.398)
STAR_DOWN	-0.086***	-0.194**	-0.010	-0.088	-0.142***	0.096	-5.478**	-2.103	-2.605	-3.920**	-0.214
	(0.031)	(0.083)	(0.080)	(0.065)	(0.052)	(0.092)	(2.706)	(2.206)	(1.600)	(1.589)	(2.424)
Observations	38,033	3,337	8,463	14,163	8,962	3,014	3,337	8,463	14,163	8,962	3,014
Category FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Vintage FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Adj R^2	0.0413	0.0965	0.0589	0.0338	0.0595	0.108	0.143	0.0789	0.0736	0.0904	0.157

Table A.4. Asymmetric Effects of COVID-19 on Fund Inflows and Outflows

This table presents results from fund-week level regressions of the absolute value of net flows (ABS_FLOW) on NEG_FLOW − an indicator for whether the fund's weekly net flow is negative − and its interactions with HIGH_ESG and LOW_ESG − dummy variables indicating whether a fund had a high or low Morningstar sustainability rating as of December, 2019 − and their interactions with a dummy variable indicating the post-COVID period starting in the week ending February 22, 2020. Control variables include prior month's return, interactions between past returns and the COVID period and NEG_FLOW dummies, log of total net assets, expense ratio, dummies for star rating upgrades and downgrades, as well as category-by-week, vintage-by-week, and sustainability rating fixed effects. Standard errors are adjusted for clustering at fund and category-by-week levels (*** p<0.01, ** p<0.05, * p<0.1).

	Dependent Variable: ABS_FLOW	
	1	2
HIGH_ESG × COVID × NEG_FLOW	0.227**	0.216**
	(0.095)	(0.095)
HIGH_ESG × COVID	-0.151*	-0.135
	(0.086)	(0.086)
LOW_ESG × COVID × NEG_FLOW	-0.172	-0.174
	(0.115)	(0.116)
LOW_ESG × COVID	0.182	0.176
	(0.115)	(0.116)
HIGH_ESG × NEG_FLOW	-0.207***	-0.200***
	(0.074)	(0.073)
LOW_ESG × NEG_FLOW	0.005	0.010
	(0.086)	(0.083)
COVID × NEG_FLOW	-0.068*	-0.077
	(0.037)	(0.058)
NEG_FLOW	-0.061***	-0.034
	(0.024)	(0.025)
Observations	37,654	37,654
Category-by-Week FE	Y	Y
Vintage-by-Week FE	Y	Y
Sustainability Rating FE	Y	Y
Controls	Y	Y
RET/COVID/NEG_FLOW Interactions	N	Y
Adj R^2	0.0948	0.0952

Table A.5. Institutional Fund Flows Around COVID-19

Panel A of this table presents results from fund-week level difference-in-differences regressions of institutional normalized or raw net flows (NORM_FLOW or RAW_FLOW) on HIGH_ESG and LOW_ESG − dummy variables indicating the fund's Morningstar sustainability rating as of December, 2019 − and their interactions with a COVID_CRASH dummy indicating the market crash period from February 22 to March 21, 2020 and a COVID_STIMULUS dummy indicating the stimulus period from March 28 to April 25, 2020. Panel B reports results from OLS regressions of institutional normalized net flows (NORM_FLOW) on HIGH_ESG, ABOVE_AVG_ESG, BELOW_AVG_ESG, and LOW_ESG dummy variables, shown for pre-COVID and post-COVID sub-periods. Panel C presents results from regressions of institutional normalized net flows (NORM_FLOW) on the COVID_CRASH and COVID_STIMULUS dummy variables, run for the full sample as well as separately for subsamples of funds in each Morningstar sustainability rating group. Control variables and fixed effect configurations are as in previous tables. In all panels, standard errors are adjusted for clustering at fund and category-by-week levels (*** p<0.01, ** p<0.05, * p<0.1).

Panel A. The Impact of COVID-19 on ESG Fund Flows

	Dependent Variable:			
	NORM_FLOW		RAW_FLOW	
	1	2	3	4
HIGH_ESG × COVID_CRASH	-1.915	-1.715	0.006	0.027
	(1.448)	(1.525)	(0.101)	(0.102)
HIGH_ESG × COVID_STIMULUS	-2.609*	-1.632	0.056	0.125
	(1.367)	(1.474)	(0.085)	(0.092)
LOW_ESG × COVID_CRASH	-0.771	-1.527	-0.228**	-0.285**
	(1.621)	(1.614)	(0.108)	(0.113)
LOW_ESG × COVID_STIMULUS	1.404	-0.840	0.068	-0.080
	(1.778)	(1.570)	(0.133)	(0.126)
Observations	34,170	34,166	34,170	34,166
Category-by-Week FE	Y	Y	Y	Y
Vintage-by-Week FE	Y	Y	Y	Y
Sustainability Rating FE	Y	N	Y	N
Fund FE	N	Y	N	Y
Controls	Y	Y	Y	Y
RET/COVID Interactions	Y	Y	Y	Y
Adj R^2	0.0627	0.314	0.0344	0.174

Table A.5. Institutional Fund Flows Around COVID-19 (continued)

Panel B. Fund ESG Ratings and Fund Flows

	Dependent Variable: NORM_FLOW		
	Pre-COVID	Post-COVID	
		Crash	Stimulus
	Jan4 − Feb15	Feb22 − Mar21	Mar28 − Apr25
	1	2	3
HIGH_ESG	6.541***	3.713**	3.355**
	(1.495)	(1.494)	(1.632)
ABOVE_AVG_ESG	5.215***	0.428	2.425**
	(1.232)	(1.151)	(1.215)
BELOW_AVG_ESG	1.147	1.233	3.131**
	(1.034)	(1.080)	(1.250)
LOW_ESG	0.449	-1.767	1.985
	(1.606)	(1.539)	(2.025)
Observations	14,344	9,996	9,830
Category-by-Week FE	Y	Y	Y
Vintage-by-Week FE	Y	Y	Y
Controls	Y	Y	Y
Adj R^2	0.0583	0.0625	0.0754

Panel C. Fund Flows Around COVID-19

	Dependent Variable: NORM_FLOW				
	High	Above Average	Average	Below Average	Low
	1	2	3	4	5
COVID_CRASH	0.325	-0.590	3.765***	3.055**	-1.052
	(1.648)	(0.953)	(0.917)	(1.182)	(1.552)
COVID_STIMULUS	3.402	4.573**	6.041***	5.341***	2.600
	(2.435)	(1.774)	(1.555)	(1.851)	(2.295)
Observations	3,275	7,790	12,689	7,905	2,723
Category FE	Y	Y	Y	Y	Y
Vintage FE	Y	Y	Y	Y	Y
Controls	Y	Y	Y	Y	Y
Adj R^2	0.0997	0.0717	0.0513	0.0742	0.161

Table A.6. Retail vs. Institutional Sustainability Fund Flows

This table presents results from pooling retail and institutional funds and running fund-week level regressions of net flows on RETAIL − an indicator for whether the fund is a retail fund − and its interactions with HIGH_ESG and LOW_ESG − dummy variables indicating whether a fund had a high or low Morningstar sustainability rating as of December, 2019 − and their interactions with a COVID_CRASH dummy indicating the market crash period from February 22 to March 21, 2020 and a COVID_STIMULUS dummy indicating the stimulus period from March 28 to April 25, 2020. The dependent variable is either normalized net flow (NORM_FLOW) or raw net flow (RAW_FLOW). Control variables include prior month's return, interaction between past returns and the COVID period dummy, log of total net assets, expense ratio, dummies for star rating upgrades and downgrades, as well as category-by-week, vintage-by-week, and sustainability rating fixed effects. We further report results from specifications with fund-by-week fixed effects instead, dropping fund-level control variables that are shared by retail and institutional classes of the same fund. Standard errors are adjusted for clustering at fund and category-by-week levels (*** p<0.01, ** p<0.05, * p<0.1).

	Dependent Variable:			
	NORM_FLOW		RAW_FLOW	
	1	2	3	4
HIGH_ESG × COVID_CRASH × RETAIL	-4.138**	-3.626	-0.229**	-0.136
	(2.041)	(2.359)	(0.106)	(0.106)
HIGH_ESG × COVID_STIMULUS × RETAIL	-3.457	-4.584**	-0.280**	-0.292**
	(2.128)	(2.321)	(0.119)	(0.120)
LOW_ESG × COVID_CRASH × RETAIL	4.783**	3.253	0.288**	0.321**
	(1.916)	(2.435)	(0.127)	(0.149)
LOW_ESG × COVID_STIMULUS × RETAIL	3.219*	0.438	0.141	-0.047
	(1.777)	(2.245)	(0.118)	(0.139)
HIGH_ESG × RETAIL	-0.962	-0.403	0.014	0.016
	(1.670)	(1.809)	(0.065)	(0.067)
LOW_ESG × RETAIL	-1.656	-2.345	-0.013	-0.057
	(1.623)	(2.106)	(0.067)	(0.091)
COVID_CRASH × RETAIL	-1.380*	-1.215	-0.168***	-0.189***
	(0.736)	(0.843)	(0.048)	(0.054)
COVID_STIMULUS × RETAIL	1.011	1.666	-0.128*	-0.120
	(1.162)	(1.334)	(0.074)	(0.082)
RETAIL	-3.940***	-8.050***	-0.044**	-0.131***
	(0.599)	(0.680)	(0.022)	(0.029)
HIGH_ESG × COVID_CRASH	-2.138		0.016	
	(1.511)		(0.096)	
HIGH_ESG × COVID_STIMULUS	-2.323		0.075	
	(1.473)		(0.085)	
LOW_ESG × COVID_CRASH	-1.566		-0.247**	
	(1.628)		(0.107)	
LOW_ESG × COVID_STIMULUS	0.944		0.034	
	(1.790)		(0.129)	
Observations	72,087	49,610	72,087	49,610
Category-by-Week FE	Y	N	Y	N
Vintage-by-Week FE	Y	N	Y	N
Sustainability Rating FE	Y	N	Y	N
Fund-by-Week FE	N	Y	N	Y
Controls	Y	Y	Y	Y
RET/COVID/RETAIL Interactions	Y	Y	Y	Y
Adj R^2	0.0772	0.275	0.0367	0.129

Table A.7. Summary Statistics of the Oxford COVID-19 Government Response Tracker (OxCGRT)

This table presents summary statistics for countries in the Morningstar-OxCGRT matched sample. The lockdown stringency and economic support indices are compiled by the University of Oxford and are based on publicly available information on 18 indicators related to governmental responses to COVID-19 aggregated into common indices reported in scores ranging from 1 to 100. A country's index value is averaged over the post-COVID period.

Country	Number of funds	Economic support index	Stringency index
Australia	52	66	62
Austria	61	79	49
Belgium	68	72	58
Brazil	914	43	70
Canada	611	68	61
Chile	97	64	72
Czech Republic	1	65	49
Denmark	256	74	53
Finland	72	60	42
France	688	70	61
Germany	276	42	57
Greece	19	62	59
Hong Kong	30	97	57
India	6	62	73
Ireland	3	89	63
Italy	164	60	64
Japan	918	65	36
Malaysia	40	63	59
Mexico	5	13	66
Namibia	4	20	50
Netherlands	103	55	55
New Zealand	51	68	42
Norway	38	75	43
Portugal	9	57	64
Saudi Arabia	2	51	67
Singapore	28	77	57
Slovenia	14	60	51
South Africa	208	51	64
Spain	375	77	63
Sweden	114	48	54
Switzerland	318	38	49
Taiwan	14	33	26
Thailand	422	78	53
United Arab Emirates	2	43	55
United Kingdom	573	89	63
United States	2358	55	59

Table A.8. Effects of COVID-19 on ESG Fund Flows Around the World

This table presents results from an extended international sample of open-end mutual funds. Fund-week level difference-in-differences regressions of normalized net flows (NORM_FLOW) on HIGH_ESG and LOW_ESG − dummy variables indicating whether a fund had a high or low Morningstar sustainability rating as of December, 2019 − and their interactions with a dummy variable indicating the post-COVID period starting in the week ending February 22, 2020, are run on subsamples consisting of funds sold in countries with stringent vs. lax restriction policies (subsamples within all countries, or within a subset of countries that had either low or high economic support), or low vs. high GDP growth during the COVID-19 crisis. Countries are classified as stringent vs. lax or low vs. high support according to the Oxford COVID-19 Government Response Tracker (OxCGRT) restriction stringency and economic support indices. Alternatively, the subsamples are pooled together and the regressions are augmented by further interacting country level dummies indicating restriction stringency (STRINGENT) or low economic growth rates (LOW_GROWTH) during the post-COVID period. Control variables include prior month's return, interactions between past returns and the COVID period dummy, log of total net assets, dummies for star rating upgrades and downgrades, as well as category-by-week, vintage-by-week, country, and fund fixed effects. Standard errors are adjusted for clustering at fund and category-by-week levels (*** p<0.01, ** p<0.05, * p<0.1).

	Dependent Variable: NORM_FLOW											
	Stringency of Lockdowns and Business Restrictions									GDP Growth		
	All Countries			Low Stimulus Countries			High Stimulus Countries					
	Stringent	Lax	Pooled	Stringent	Lax	Pooled	Stringent	Lax	Pooled	Low	High	Pooled
	1	2	3	4	5	6	7	8	9	10	11	12
HIGH_ESG × COVID	-5.308***	-1.364	-1.364	-6.158***	0.855	0.855	-4.225***	-3.317*	-3.317*	-5.312***	-3.109***	-3.109***
	(0.871)	(1.279)	(1.275)	(1.293)	(1.730)	(1.709)	(1.152)	(1.788)	(1.786)	(1.202)	(0.960)	(0.961)
LOW_ESG × COVID	2.733***	0.365	0.365	2.395**	-0.006	-0.006	4.055***	-0.354	-0.354	2.644**	1.784**	1.784**
	(0.793)	(1.224)	(1.221)	(1.008)	(1.859)	(1.836)	(1.418)	(1.676)	(1.673)	(1.157)	(0.905)	(0.906)
HIGH_ESG × COVID × STRINGENT			-3.944**			-7.013***			-0.907			
			(1.533)			(2.137)			(2.170)			
LOW_ESG × COVID × STRINGENT			2.368			2.401			4.409**			
			(1.443)			(2.058)			(2.175)			
HIGH_ESG × COVID × LOW_GROWTH												-2.203
												(1.522)
LOW_ESG × COVID × LOW_GROWTH												0.860
												(1.449)
HIGH_ESG × COVID: Stringent < Lax (Low < High)?	0.01			0.00			0.33			0.08		
Observations	90,442	34,572	125,014	54,175	13,095	67,270	36,093	21,400	57,493	48,770	65,867	114,637
Category-by-Week FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Vintage-by-Week FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Fund FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Interactions & Other Terms	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Adj R^2	0.338	0.260	0.317	0.360	0.219	0.335	0.316	0.292	0.307	0.337	0.314	0.326

Table A.9. Fund Performance and the Effects of COVID-19 on ESG Fund Flows

In this table, Panel A presents net flow spreads between high and low ESG funds within fund quintiles formed on Fama and French (2015) five factor model alphas and betas estimated using returns over the previous 12 months on a rolling-window basis. Funds are classified as high or low ESG based on their Morningstar historical sustainability scores as of December, 2019, by sequentially sorting funds within their alpha or beta quintile groups. The average raw net flows (as a percentage of previous week's total net assets) of high and low ESG funds within each alpha or beta quintile, as well as the high-low spread and its t-statistic, are reported for the pre-COVID sample (January 4 to February 15, 2020) and post-COVID samples (February 22 to March 21, 2020 "crash period" and March 28 to April 25, 2020 "stimulus period"). Panel B presents results from fund-week level difference-in-differences regressions of weekly fund returns (WEEKLY_RETURN) or normalized net flows (NORM_FLOW) on HIGH_ESG and LOW_ESG − dummy variables indicating whether a fund had a high or low Morningstar sustainability rating as of December, 2019 − and their interactions with dummy variables indicating the post-COVID market crash period from February 22 to March 21, 2020 (COVID_CRASH) and stimulus period from March 28 to April 25, 2020 (COVID_STIMULUS). In the first two columns, the dependent variable is the fund's WEEKLY_RETURN. In the next four columns, the dependent variable is NORM_FLOW, and the post-COVID period dummies are also interacted with the fund's market beta or average return during the post-COVID period. Control variables include prior month's return, interaction between past returns and the COVID period dummy, log of total net assets, expense ratio, dummies for star rating upgrades and downgrades, as well as category-by-week, vintage-by-week, and sustainability rating or fund fixed effects. Standard errors are adjusted for clustering at fund and category-by-week levels (*** p¡0.01, ** p¡0.05, * p¡0.1).

Panel A. Fund Flow Differentials Controlling for Fund Alphas and Betas

	Pre-COVID				Post-COVID							
	Jan4 − Feb15				Crash Feb22 − Mar21				Stimulus Mar28 − Apr25			
Alpha or Beta Quintile	High ESG	Low ESG	High−Low	t-stat	High ESG	Low ESG	High−Low	t-stat	High ESG	Low ESG	High−Low	t-stat
Alpha and Historical Sustainability Score Sequential Sorts												
1	-0.31	-0.42	0.11	1.79*	-0.62	-0.67	0.06	0.45	-0.29	-0.11	-0.18	-1.62
2	-0.11	-0.29	0.18	3.91***	-0.56	-0.49	-0.07	-0.63	-0.15	0.04	-0.20	-2.19**
3	-0.08	-0.22	0.14	3.35***	-0.29	-0.37	0.08	0.83	-0.13	0.06	-0.19	-2.22**
4	0.08	-0.29	0.36	6.07***	-0.30	-0.43	0.12	1.28	0.07	0.02	0.05	0.54
5	0.08	-0.07	0.16	3.29***	-0.43	-0.54	0.11	1.02	0.01	0.05	-0.04	-0.39
Beta and Historical Sustainability Score Sequential Sorts												
1	0.01	-0.15	0.15	3.04***	-0.41	-0.63	0.22	1.84*	-0.07	-0.17	0.10	0.90
2	0.03	-0.14	0.17	3.17***	-0.47	-0.56	0.08	0.70	-0.14	-0.12	-0.02	-0.17
3	-0.17	-0.25	0.08	1.57	-0.38	-0.47	0.09	1.03	-0.07	0.17	-0.24	-2.28**
4	-0.14	-0.31	0.16	3.49***	-0.42	-0.45	0.03	0.30	-0.06	-0.01	-0.04	-0.58
5	-0.15	-0.35	0.20	3.71***	-0.56	-0.43	-0.13	-1.17	-0.14	-0.14	0.00	-0.05

Table A.9. Fund Performance and the Effects of COVID-19 on ESG Fund Flows (continued)

Panel B. Buying Losers and Selling Winners?

	Dependent Variable:					
	WEEKLY_RETURN		NORM_FLOW			
	1	2	3	4	5	6
HIGH_ESG × COVID_CRASH	0.276**	0.380***	-5.483***	-5.007***	-5.308***	-4.765***
	(0.120)	(0.122)	(1.685)	(1.576)	(1.640)	(1.558)
HIGH_ESG × COVID_STIMULUS	-0.181**	0.001	-5.069***	-4.110***	-5.240***	-4.512***
	(0.085)	(0.082)	(1.576)	(1.530)	(1.524)	(1.517)
LOW_ESG × COVID_CRASH	-0.382*	-0.474**	3.129**	2.348*	2.421*	2.024
	(0.216)	(0.212)	(1.466)	(1.400)	(1.450)	(1.382)
LOW_ESG × COVID_STIMULUS	0.413***	0.060	3.889**	1.523	3.058*	1.525
	(0.150)	(0.135)	(1.708)	(1.538)	(1.684)	(1.556)
BETA × COVID_CRASH			2.469	-2.389		
			(4.546)	(3.981)		
BETA × COVID_STIMULUS			7.980	2.772		
			(6.023)	(4.641)		
BETA			-2.908	-1.390		
			(2.642)	(2.077)		
COVID_RET × COVID_CRASH					-1.730***	-1.546***
					(0.546)	(0.527)
COVID_RET × COVID_STIMULUS					-0.013	1.858
					(1.070)	(1.129)
COVID_RET					1.832***	
					(0.444)	
Observations	37,654	34,746	35,379	35,377	37,490	37,490
Category-by-Week FE	Y	Y	Y	Y	Y	Y
Vintage-by-Week FE	Y	Y	Y	Y	Y	Y
Sustainability Rating FE	Y	N	Y	N	Y	N
Fund FE	N	Y	N	Y	N	Y
Controls	Y	Y	Y	Y	Y	Y
RET/COVID Interactions	Y	Y	Y	Y	Y	Y
Adj R^2	0.963	0.963	0.0742	0.350	0.0762	0.353

Table A.10. Past Fund Flows and the Effects of COVID-19 on ESG Fund Flows

In this table, Panel A presents net flow spreads between high and low ESG funds within fund quintiles first formed on past 12-month fund flows on a rolling-window basis. Funds are classified as high or low ESG based on their Morningstar historical sustainability scores as of December, 2019, by sequentially sorting funds within their past flow quintile groups. The average raw net flows (as a percentage of previous week's total net assets) of high and low ESG funds within each past flow quintile, as well as the high-low spread and its t-statistic, are reported for the pre-COVID sample (January 4 to February 15, 2020) and post-COVID samples (February 22 to March 21, 2020 "crash period" and March 28 to April 25, 2020 "stimulus period"). Panel B reports results from fund-week level triple-difference regressions of normalized net flows (NORM_FLOW) on HIGH_ESG and LOW_ESG − dummy variables indicating whether a fund had a high or low Morningstar sustainability rating as of December, 2019 − and their interactions with a dummy variable indicating the post-COVID period starting in the week ending February 22, 2020, further interacted with past fund flows measured over the pre-COVID sample period from January 4 to February 15, 2020, or over the past 12 months before our sample period. Past fund flows are either normalized by subtracting the cross-sectional mean and dividing by the standard deviation (PAST_FLOW), or alternatively used to create an indicator variable classifying whether a fund is in the top past flow quintile (HIGH_PAST_FLOW). Control variables include prior month's return, interaction between past returns and the COVID period dummy, interactions between past fund flows and the COVID period or HIGH_ESG/LOW_ESG dummies, log of total net assets, expense ratio, dummies for star rating upgrades and downgrades, as well as category-by-week, vintage-by-week, and sustainability rating or fund fixed effects. Standard errors are adjusted for clustering at fund and category-by-week levels (*** p¡0.01, ** p¡0.05, * p¡0.1).

Panel A. Prior 12-Month Flow and Historical Sustainability Score Sequential Sorts

	Pre-COVID				Post-COVID							
	Jan4 − Feb15				Crash Feb22 − Mar21				Stimulus Mar28 − Apr25			
Past Flow Quintile	High ESG	Low ESG	High−Low	t-stat	High ESG	Low ESG	High−Low	t-stat	High ESG	Low ESG	High−Low	t-stat
1	-0.30	-0.41	0.11	3.29***	-0.61	-0.69	0.08	1.13	-0.32	-0.22	-0.10	-1.23
2	-0.26	-0.34	0.08	1.92*	-0.68	-0.57	-0.10	-1.31	-0.30	-0.02	-0.28	-3.33***
3	-0.20	-0.40	0.19	3.96***	-0.56	-0.77	0.21	1.85*	-0.23	-0.17	-0.07	-0.87
4	-0.02	-0.23	0.21	3.26***	-0.37	-0.47	0.09	0.78	-0.05	-0.09	0.04	0.42
5	0.42	0.04	0.39	6.29***	0.08	-0.06	0.15	1.20	0.39	0.35	0.04	0.38

Table A.10. Past Fund Flows and the Effects of COVID-19 on ESG Fund Flows (continued)

Panel B. Regressions

	Dependent Variable: NORM_FLOW							
	Past Flow: Jan4 - Feb15				Past Flow: Pre-Sample 12 Months			
	1	2	3	4	5	6	7	8
HIGH_ESG × COVID	-5.358***	-4.847***	-4.881***	-4.516***	-5.938***	-5.000***	-4.498***	-3.585***
	(1.389)	(1.412)	(1.358)	(1.395)	(1.295)	(1.354)	(1.337)	(1.285)
HIGH_ESG × PAST_FLOW × COVID	1.327	2.501			-3.748	-2.674		
	(3.562)	(3.536)			(4.010)	(3.758)		
HIGH_ESG × HIGH_PAST_FLOW × COVID			1.688	2.164			-3.288	-4.326
			(2.846)	(2.974)			(3.333)	(3.549)
LOW_ESG × COVID	2.875**	2.007*	2.836**	1.788	3.799***	2.272*	2.491*	1.719
	(1.187)	(1.148)	(1.273)	(1.193)	(1.291)	(1.270)	(1.299)	(1.267)
LOW_ESG × PAST_FLOW × COVID	0.081	-3.482			2.508	0.399		
	(5.384)	(2.753)			(4.415)	(4.261)		
LOW_ESG × HIGH_PAST_FLOW × COVID			0.480	0.880			5.333	3.022
			(3.646)	(3.681)			(3.777)	(3.474)
Observations	37,654	37,652	37,654	37,652	37,392	37,391	37,392	37,391
Category-by-Week FE	Y	Y	Y	Y	Y	Y	Y	Y
Vintage-by-Week FE	Y	Y	Y	Y	Y	Y	Y	Y
Sustainability Rating FE	Y	N	Y	N	Y	N	Y	N
Fund FE	N	Y	N	Y	N	Y	N	Y
Controls / Interactions	Y	Y	Y	Y	Y	Y	Y	Y
Adj R^2	0.126	0.355	0.176	0.362	0.0841	0.350	0.127	0.352

Table A.11. Responses to Alternative Structural Shifts Around COVID-19?

This table presents results from fund-week level difference-in-differences regressions of normalized net flows (NORM_FLOW) on HIGH_ESG and LOW_ESG − dummy variables indicating whether a fund had a high or low Morningstar sustainability rating as of December, 2019 − and their interactions with a dummy variable indicating the post-COVID period starting in the week ending February 22, 2020. Control variables include prior month's return, interaction between past returns and the COVID period dummy, log of total net assets, dummies for star rating upgrades and downgrades, as well as category-by-week, vintage-by-week, and sustainability rating or fund fixed effects. In columns 1 to 6, we additionally control for the fund's status as an index fund (INDEX_FUND) or its investment focus in healthcare or tech sectors (HEALTHCARE_SECTOR or TECH_SECTOR), along with their interactions with the COVID time dummy variable. In columns 3 to 6, category-by-week fixed effects are replaced by category fixed effects to accommodate the sector × COVID interaction terms. Standard errors are adjusted for clustering at fund and category-by-week levels (*** p<0.01, ** p<0.05, * p<0.1).

	Dependent Variables: NORM_FLOW					
	1	2	3	4	5	6
HIGH_ESG × COVID	-5.781***	-4.836***	-5.675***	-4.695***	-5.729***	-4.750***
	(1.423)	(1.340)	(1.400)	(1.351)	(1.403)	(1.354)
LOW_ESG × COVID	3.960***	2.313*	3.867***	2.421**	3.965***	2.500**
	(1.274)	(1.186)	(1.184)	(1.170)	(1.188)	(1.172)
INDEX_FUND × COVID	1.367	0.773				
	(1.838)	(1.619)				
INDEX_FUND	2.069					
	(1.807)					
HEALTHCARE_SECTOR × COVID			11.390***	15.380***		
			(4.178)	(4.940)		
TECH_SECTOR × COVID					-6.483*	-5.083
					(3.382)	(3.695)
Observations	37,654	37,652	37,667	37,665	37,667	37,665
Category-by-Week FE	Y	Y	N	N	N	N
Category FE	N	N	Y	Y	Y	Y
Vintage-by-Week FE	Y	Y	Y	Y	Y	Y
Sustainability Rating FE	Y	N	Y	N	Y	N
Fund FE	N	Y	N	Y	N	Y
Controls	Y	Y	Y	Y	Y	Y
Adj R^2	0.0738	0.351	0.0614	0.339	0.0612	0.338

A.II Robustness

In this section, we provide evidence ensuring that our key results are not driven by past and contemporaneous differences in performance or differences in past flows between high and low ESG funds, or investors shifting their allocation across different types of investments.

A Fund Performance

We start by examining whether our results can be explained by past or contemporaneous differences in performance between high and low ESG funds. First, we examine the effects of sustainability ratings on flow responses to COVID-19 within groups of funds first sorted on measures of ex-ante risk-adjusted performance or market risk exposure. Panel A of Table A.9 reports results from this analysis. We first sort funds on their Fama and French (2015) five-factor alphas or betas, computed using the previous 12 months' returns on a rolling window basis. Subsequently, funds are sorted into quintiles based on the historical sustainability scores of their portfolios (which are used by Morningstar to assign globe ratings) within each alpha or beta quintile. We then report the mean and t-statistic of the difference in weekly net flows between high and low ESG funds (i.e., top and bottom historical sustainability score quintiles) within each alpha or beta quintile. Conducting this exercise over the pre-COVID and post-COVID periods, we show that high ESG funds attract more flows than low ESG funds prior to the COVID-19 shock within all alpha and beta quintiles, and that this difference disappears afterwards during both the crash and stimulus periods.

Next, we evaluate an alternative explanation that the disproportionate drop in high ESG flows may be driven by differences in contemporaneous returns. Specifically, retail investors may follow a "buying the dip" strategy where they buy into funds that depreciate sharply in value in anticipation of higher future expected returns. Conversely, investors may sell their best-performing funds to preserve liquidity in their portfolios, consistent with evidence that stocks and mutual funds with high ESG ratings performed relatively

better during the COVID-19 crisis (see, e.g., Albuquerque et al. (2020), Ding et al. (2021), and Pastor and Vorsatz (2020)).

Panel B of Table A.9 indicates that this is unlikely to be the main explanation for our results. An analysis of the impact of COVID-19 on weekly fund returns reveals that high ESG funds earn relatively higher returns only during the market crash (consistent with Albuquerque et al. (2020) and Ding et al. (2021)), but not during the post-stimulus period. In fact, high (low) ESG fund returns are relatively lower (higher) during the post-stimulus period (see column 1), and this return difference disappears altogether when fund fixed effects are included (see column 2). These transitory return differences stand in contrast with the persistent decline in high ESG fund flows, which are substantially lower during both the market crash and post-stimulus periods (see columns 3 to 6), and are therefore inconsistent with the notion that our findings may be driven by investors "buying losers and selling winners".

More generally, changes in ESG fund flows around COVID-19 may also be correlated with changes in risk preferences or beliefs about future expected returns. To account for these effects, we add additional controls to our baseline fund flow regressions in the last four columns of Panel B. These controls are the fund's market beta estimated using daily returns over monthly rolling windows (to capture changes in flows into high beta funds) and the fund's performance during the entire post-COVID period (to capture changes in flows to funds in response to their post-COVID performance), along with their interactions with post-COVID time dummy variables. None of these controls subsume our baseline results.

However, it is important to note that retail investors may well have bought the dip or changed their risk preferences and expectations during the COVID-19 shock.[35] Our tests do not preclude these possibilities but merely clarify that such channels do not fully explain our main results, solidifying our interpretation that economic distress induced by COVID-19 was a key driver for the drop in SRI demand by retail investors.

[35] Glossner et al. (2021) and Ozik et al. (2021) indeed show that retail investors changed their investment behavior during COVID-19, becoming liquidity providers for institutional trades.

B Past Fund Flows and Fund Size

Another fund characteristic that can confound our results is past fund flow. One concern is that our results may be explained by the fact that pre-COVID flows were greater for high ESG funds, i.e., that high ESG funds were more popular ex-ante (see Figure 1 and Table 2). Furthermore, if the pre-COVID high ESG fund flows were driven by new retail investors who were more likely to withdraw at the onset of the pandemic, the greater drop in post-COVID high ESG fund flows would be driven by a change in the distribution of investors rather than investor responses to an economic shock. A related concern is that net flows are computed as a fraction of total net assets, and that the change in net flows for high ESG funds may be inflated because they tend to have smaller net assets (see Panel B of Table 1).

Some of these issues, especially those related to fund size, are mitigated by using normalized net flows as our main outcome variable. Variation in this variable captures changes in fund flows as compared to other funds in the same net asset decile as of the previous period. To the extent that past flows affect accumulated net assets, this normalization approach also partially alleviates confounding effects of past popularity. Previous studies in the mutual fund flow literature have also adopted this strategy (see Hartzmark and Sussman (2019)).

Nonetheless, we conduct additional analysis to further inoculate our results from the effects of past fund flows. These results are reported in Table A.10. In Panel A, we sort funds into quintiles first by their past 12-months' cumulative dollar flows and subsequently by their historical sustainability scores. We then report the mean and t-statistic of the difference in weekly net flows between high and low ESG funds within each past flow quintile. Reporting this separately over the pre-COVID and post-COVID periods, we find that high ESG funds attract more flows than low ESG funds prior to COVID-19 within all past flow quintiles, but that this is no longer the case during the post-COVID crash and stimulus periods.

In Panel B of Table A.10, we also show that our results are robust to controlling for the effects of past fund flows in regressions that include triple interactions of the HIGH_ESG or LOW_ESG fund dummy variable, the COVID time dummy variable, and

the fund's past flows. We measure past fund flows over the pre-COVID sample period from January 4 to February 15, 2020, or over the past 12 months before our sample period. These past fund flows are either normalized by subtracting the cross-sectional mean and dividing by the standard deviation (PAST_FLOW), or alternatively used to create an indicator variable classifying whether a fund is in the top past flow quintile (HIGH_PAST_FLOW). In all specifications, the triple interaction term is not statistically different from zero, while the interaction term between the HIGH_ESG and COVID period dummies is similar in magnitude and significance to our baseline results (see Table 2). While the coefficient on the triple interaction term is economically larger when past flows are measured over the pre-sample 12-month period, they remain statistically insignificant and do not subsume the baseline coefficients. These results show that our main findings are not driven by the fact that high ESG funds experienced greater past flows.

C Structural Shift in Investor Allocation

We also test whether investors have changed their appetite for active rather than passive investing, or turned their attention to sectors affected by COVID-19 (e.g., healthcare or technology). In Table A.11, we directly control for shifts to and from passive funds or COVID-related sector funds. We do this by adding INDEX_FUND, HEALTHCARE_SECTOR, or TECH_SECTOR fund dummy variables to our baseline difference-in-differences regressions along with their interactions with the post-COVID period time dummy variable. We find that these additional controls do not affect our baseline result that high ESG fund flows decline after COVID-19, despite some evidence of increased flows to healthcare sector funds (consistent with investors seeking opportunities related to COVID-19) and decreased flows to tech sector funds (consistent with investors increasingly investing in tech stocks directly).

A.III Survey

This appendix provides details on the design of the survey experiment discussed in Section IV.D and reported in Table 6.

A Recruitment of Survey Participants

In November 2021, we recruited 1,000 participants through Prolific, an online survey participant recruitment platform that provides access to a large and high-quality pool of participants. Prolific has several advantages over other online platforms. First, it provides several pre-set screening filters based on past participant responses as well as basic demographic data. Second, Prolific participants have been found to be more attentive and produce responses of higher quality compared to other platforms such as Amazon MTurk (see, e.g., Peer, Brandimarte, Samat, and Acquisti (2017), Palan and Schitter (2018), and Bergman, Chinco, Hartzmark, and Sussman (2020)). For example, Prolific prohibits participants from frequently changing answers to the pre-screening questions and reviews the plausibility of any submitted changes. Prolific also monitors accounts to block malicious and poor-quality participants from enrolling in future surveys. This allows us to target participants who reside in the U.S. and previously answered "Yes" to one of Prolific's pre-screening questions, "Have you ever made investments (either personal or through your employment) in the common stock or shares of a company?". To corroborate this filter on prior investment experience, we also ask in our survey whether participants have invested in stocks and/or mutual funds in the past five years. We also provide explanations in simple terms of what mutual funds, average returns, volatility, and sustainability ratings are. To proceed with our survey, we require participants to pass a comprehension check that tests whether they have understood these concepts. We exclude responses from participants who failed an attention check half-way into the survey to ensure participants have read and answered our questions carefully. The final sample consists of 808 survey responses. Summary statistics of the

participants are discussed in the main text in Section D and presented in Panel A of Table 6.

B Survey Design

The survey is presented in parsimonious language and graphics. After signing a consent form, participants are given simple explanations of mutual funds, average returns, volatility, and sustainability ratings. These concepts are described in non-technical terms to facilitate comprehension, as shown below. Notably, the definition of a sustainability rating is described as neutrally as possible. Moreover, following Chinco et al. (2022), information on returns and volatility are presented this way instead of being described as "expected returns" or "expected volatility", which are conceptually harder for non-expert participants to comprehend.

> *On the following pages, you will be presented with information about different mutual funds that invest in well-diversified portfolios of different stocks. The value of a mutual fund reflects the value of its investments, so when the stocks it invests in have higher prices, the value of the mutual fund will be higher.*
>
> *You will be shown numeric values for the average return per year and annual volatility of the mutual funds. When the average return per year is higher you should expect greater increases in value in a given year. When volatility is higher, you should expect greater swings, for example higher highs and lower lows, than if volatility is lower.*
>
> *You will also be shown information about a mutual fund's sustainability rating. Funds with higher sustainability ratings invest in corporations with higher sustainability ratings. The aim of a sustainability rating is to measure the extent of positive environmental and social impact, as well as better governance structures (for example, environmentally friendly production processes, fair treatment of workers, and support of local communities). Sustainability ratings are also known as "ESG rating", where "ESG"stands for "environmental, social and governance".*

After reading this information, participants are required to pass a comprehension test in which they are asked to correctly answer three multiple-choice questions: (i) "*When*

average return is higher, which of the following should you expect?", (ii) "*When volatility is higher, which of the following should you expect?*", and (iii) "*What does a higher sustainability rating aim to measure?*". Participants who pass this comprehension check are then allowed to proceed with the survey experiment, and are given further instructions regarding the six independent rounds of questions they will be asked to answer.

> *You have passed the comprehension check.*
>
> *You will now see six rounds of questions. Each round you will see information about the average return, volatility, and sustainability rating of two different mutual funds that invest in well-diversified portfolios of stocks. The average return and volatility are illustrated in a graph that shows the cumulative return on a $100 investment over the past 10 years. The sustainability rating is presented in the form of a score from 1 (lowest sustainability) to 5 (highest sustainability). We will also ask you to suppose hypothetical changes to your current income.*
>
> *The information on mutual funds and your income are not real, and they will vary from round to round. Please treat this information as the relevant information to be used to inform your investment decision, as if it were real. Also, please treat each round as independent of each other.*

In each round of the survey experiment, participants are shown hypothetical information about the average returns, volatility and sustainability ratings of two different mutual funds, A and B. The average return and volatility of each fund are illustrated in figures displaying the cumulative return on an initial investment of $100 over the past 10 years. Following Chinco et al. (2022), we ask participants to use this past information as the relevant information to be used for their investment decision, so that the average returns are understood as the appropriate expected returns going forward. Importantly, the two funds are arbitrarily assigned different sustainability ratings displayed in the same fashion as Morningstar sustainability ratings: Fund A is assigned an "average" sustainability rating of three globes, and fund B is assigned a "high" sustainability rating of five globes. However, we do not overemphasize the sustainability ratings in ways that can influence how participants perceive

the framing of the survey. For example, sustainability ratings are shown below the average returns and volatility of funds, rather than as the first and foremost item participants see.[36]

Each round, participants are asked to allocate their hypothetical investments between funds A and B as a fraction of 100% (i.e., Allocations across the two funds must total 100%). Throughout the six independent rounds of the experiment, both the participant's hypothetical income as well as the return difference between funds A and B vary. Participants see an average return on fund A fixed at 8%, but randomly draw an average return on fund B of either 4%, 5%, 6%, 7%, or 8%. In the first two rounds, we ask participants to allocate their investments given their current income. In the next two rounds, we ask them to suppose that they had lost 25% of their income, and in the final two rounds that they had lost 50% of their income. In all rounds, the two funds maintain their respective three and five globe sustainability ratings, and volatility is fixed at 10% for both funds. This allows us to estimate the effects of income shocks and expected returns on the allocations between funds A and B. A screenshot of the survey interface as seen by participants is shown in Figure A.5.

> *Suppose you lose 25% of your income (for example, because you move to a lower-paying job, you are furloughed, your business loses customers, etc..). Given the information presented above, how would you allocate your financial investments between Fund A and Fund B? (must total 100%)*

After the six-round experiment, we subsequently ask participants questions to elicit their return expectations on high ESG funds and average ESG funds. To do so, we show participants real-life information on the average returns, volatility, and sustainability ratings of the MSCI USA Standard index fund and MSCI USA SRI index fund over the period from 2010 to 2019, and ask what they expect their future average returns will be from 2022 to 2032. This questionnaire is shown in Figure A.6.

After participants provide their future return estimates for the MSCI USA Standard and MSCI USA SRI funds, we ask them "*Would your return estimates for the two funds over*

[36]The title of the survey as shown to participants is also broadly framed as "*An Experimental Survey of Financial Investments by Individuals*", so that participants do not perceive the survey as specifically focused on sustainable investing, at least until they complete the first part of the experiment.

2022 - 2032 be different if the COVID-19 pandemic had not happened?". If their answer is "*Yes*", they are again presented with the same information and asked to provide their return estimates under the counterfactual scenario in which the COVID-19 crisis did not happen.

> *If the COVID-19 pandemic had not happened, what do you think would be the average return of the MSCI USA Standard and MSCI USA SRI funds over 2022 - 2032 in percentage points? (for example, enter 5.3% as 5.3, omitting the %-sign)*

Following the earlier section of the survey, we additionally ask participants a number of questions about their view on sustainable investing and their investment experience. The responses to these questions are summarized in Panel A of Table 6.

- *Why are sustainability issues important for you as an investor, if at all? Select all that apply.*
- *Compared to before the COVID-19 pandemic, do you think sustainability issues have become more or less important as societal issues?*
- *Compared to before the COVID-19 pandemic, do you think commitment to sustainability issues will be a more or less important source of financial value for corporations?*
- *Have you personally invested in mutual funds and/or stocks in the last five years?*
- *Have you recently held a professional occupation that required you to regularly trade financial instruments? (for example, asset management, mutual fund, hedge fund, private equity, trading, etc.)*
- *In making your financial investments, do you consider sustainability issues of the companies or assets you invest in?*
- *How did your economic situation change during the first few months of the COVID-19 pandemic (Feb - April 2020)?*
- *Did you lose your job during the COVID-19 pandemic?*

In the middle of the survey, we also include the question, "*If you are reading carefully, please select the Other option and enter the word Read in the space provided*", as an attention check. In our analysis, we exclude responses from participants who fail this attention check.

Finally, we directly ask participants how much annual returns they would be willing to give up in order to invest in an SRI fund with a high sustainability rating rather than an average fund, given hypothetical income scenarios. These explicit questions serve to corroborate the survey experiments that elicit whether income shocks matter for SRI demand.

> *Given your current income, how much annual return (in percentage points) would you be willing to give up to invest $1,000 in a mutual fund with the highest sustainability rating (5 globes) rather than average sustainability rating (3 globes)? (for example, enter 5.3% as 5.3, omitting the %-sign)*
>
> *Suppose you lose 25% of your income (for example, because you move to a lower-paying job, you are furloughed, your business loses customers, etc..). How much annual return (in percentage points) would you be willing to give up to invest $1,000 in a mutual fund with the highest sustainability rating (5 globes) rather than average sustainability rating (3 globes)? (for example, enter 5.3% as 5.3, omitting the %-sign)*
>
> *Suppose you lose 50% of your income (for example, because you move to a lower-paying job, you are furloughed, your business loses customers, etc..). How much annual return (in percentage points) would you be willing to give up to invest $1,000 in a mutual fund with the highest sustainability rating (5 globes) rather than average sustainability rating (3 globes)? (for example, enter 5.3% as 5.3, omitting the %-sign)*

We conclude the survey by asking participants a multiple-choice question to indicate their income brackets and an open question on whether anything was confusing. Other demographic data provided by Prolific are reported in Panel A of Table 6.

Figure A.5. Screenshot of the Survey Experiment (25% Income Shock Scenario)

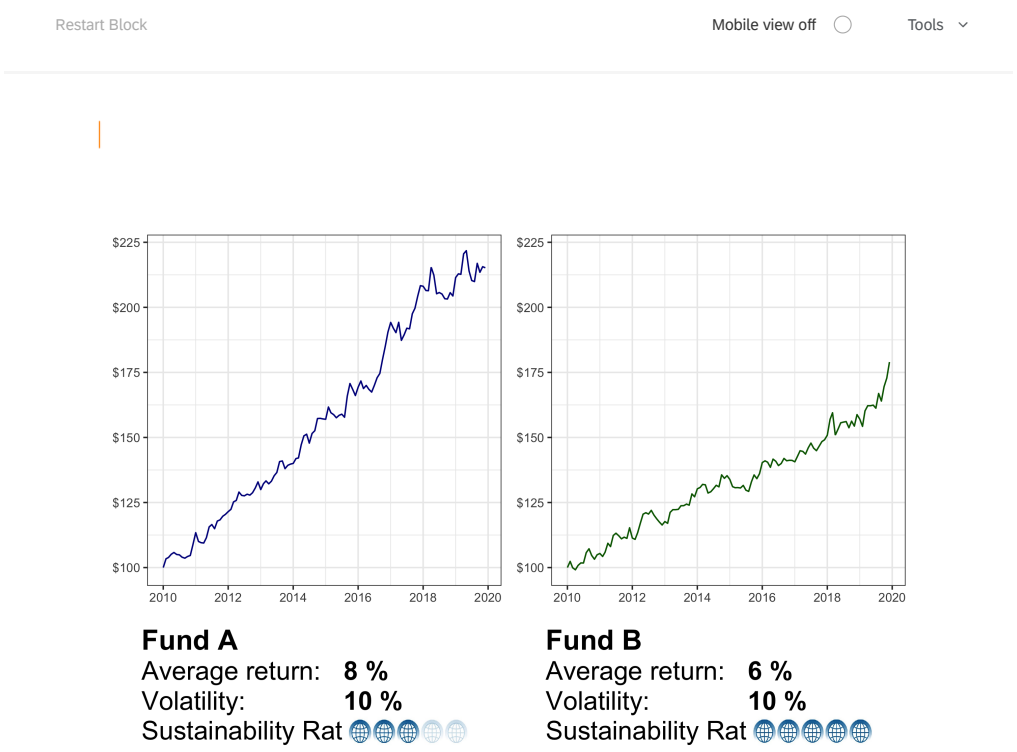
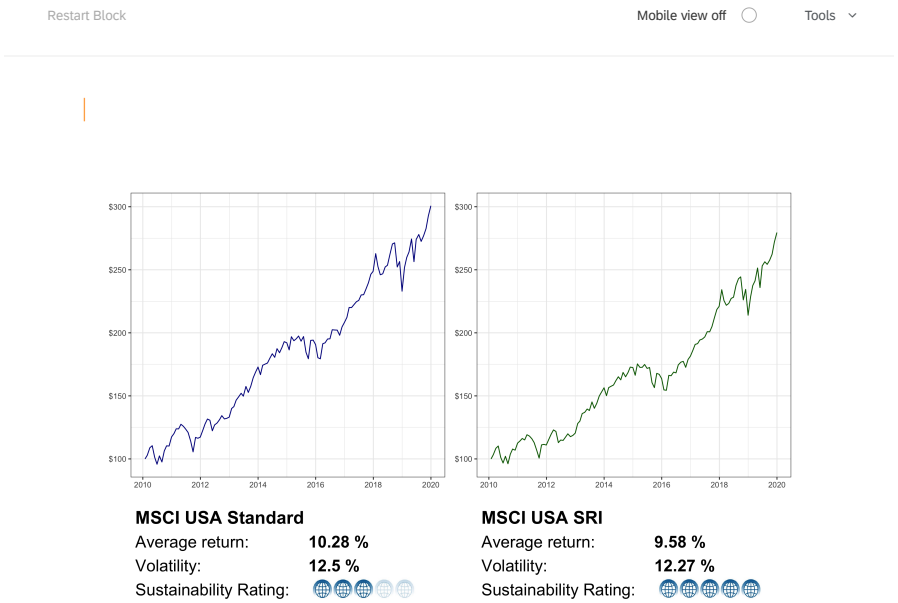


Figure A.6. Screenshot of the Survey Questionnaire on Return Expectations



A.IV Simple Model of SRI Demand

To illustrate potential determinants of SRI demand by individual investors, this appendix sketches a simple asset pricing model in which investors derive utility from current and future consumption, as well as from holding sustainable (i.e., high ESG) assets.

In a model with two periods, t and $t+1$, the representative investor has access to two investment assets, a "dirty" (i.e., low ESG) investment and a "sustainable" (i.e, high ESG) investment. Investors face an exogenous income stream, y_t and y_{t+1}, and consume c_t and c_{t+1} by deciding how much of y_t to allocate to dirty investments, x_t^d, and to sustainable investments, x_t^s. In time $t+1$, dirty and sustainable investments generate returns, r_{t+1}^d and r_{t+1}^s, respectively. Consistent with empirical evidence (see, e.g., Bolton and Kacperczyk (2021) and Pastor et al. (2021a)) and theoretical models of SRI demand (see Pastor et al. (2021b)), we assume that dirty investments command higher expected returns than sustainable investments, such that $\mathbb{E}[r_{t+1}^d] > \mathbb{E}[r_{t+1}^s]$.[37] Investors derive non-pecuniary utility, $v(x_t^s)$, from holding sustainable investments. Investors maximize their utility function, given by

$$U(c_t, c_{t+1}, x_t^s) = u(c_t) + \beta \mathbb{E}_t \left[u(c_{t+1})\right] + v(x_t^s), \tag{A.1}$$

where $u(.)$ and $v(.)$ are increasing and concave functions.

The budget constraints at time t and $t+1$ are given by

$$c_t + x_t^s + x_t^d = y_t, \tag{A.2}$$

$$c_{t+1} = y_{t+1} + (1 + r_{t+1}^d)x_t^d + (1 + r_{t+1}^s)x_t^s. \tag{A.3}$$

Investors choose x_t^d and x_t^s that maximize Equation (A.1) subject to Equation (A.2)

[37] Note that higher past realized returns may reflect unexpected increases in environmental concerns and are not inconsistent with lower expected returns going forward (see Pastor et al. (2021a)). Lower expected returns on high ESG assets by retail investors is also consistent with responses from our survey, where respondents expect the MSCI Standard index to perform better than the MSCI SRI index (see Figure 5).

and Equation (A.3). The first order conditions with respect to x_t^d and x_t^s are, respectively,

$$\mathbb{E}_t\left[(1+r_{t+1}^d)M_{t+1}\right] = 1, \tag{A.4}$$

$$\mathbb{E}_t\left[(1+r_{t+1}^s)M_{t+1}\right] = 1 - \frac{v'(x_t^s)}{u'(c_t)}, \tag{A.5}$$

where $M_{t+1} = \beta\frac{u'(c_{t+1})}{u'(c_t)}$ is the stochastic discount factor.

Combining Equation (A.4) and Equation (A.5) yields the following equation, which characterizes the demand for sustainable investments, x_t^s.

$$v'(x_t^s) = \beta\mathbb{E}_t\left[u'(c_{t+1})(r_{t+1}^d - r_{t+1}^s)\right].$$

In this equation, investors weigh the marginal utility from holding high ESG assets against the loss of consumption utility due to the lower expected returns on sustainable investments relative to dirty investments. This highlights two important channels that may explain the observed decline in the demand for sustainable investments following COVID-19.

First, the demand for sustainable investments is lower when the gap between the expected returns on dirty and sustainable investments, $\mathbb{E}_t\left[(r_{t+1}^d - r_{t+1}^s)\right]$, is wider. This implies that changes in beliefs about expected returns could explain the decline in SRI demand if investors *lowered (raised)* their expectations about future returns on sustainable (dirty) assets after the COVID-19 shock. In our survey, we find this not to be the case among retail investors.

Second, the demand for sustainable investments is lower when the marginal utility of consumption, $\mathbb{E}_t\left[u'(c_{t+1})\right]$, is higher. This implies that investors would shift away from sustainable investments in the face of an exogenous income shock, because the marginal utility from consumption that can be obtained through dirty investments is higher after such a shock. This channel is highlighted by our findings − both in the COVID-19 setting and in the survey experiment − that retail SRI demand is highly sensitive to income shocks.