Are Investors Paying to Be Green? Evidence from Mutual Funds*

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Abstract

We study how investors' preferences for green investments drive mutual fund allocation decisions and how mutual fund managers respond to these preferences. We document a "green fund fee premium": the average self-labeled green fund charges about 5 basis points in additional fees annually. This premium is larger for funds that invest accordingly: the average low-emission fund is up to 10 basis points more expensive compared to its higher-emission counterpart. Our findings imply that mutual fund investors are paying between 1 and 2 basis points in additional fees for each 1 million tonne reduction in CO_2 emissions. We further exploit a setting where funds decide to adopt greener-sounding names. Funds that repurpose attract vastly larger flows in the period following the name change and raise fees by up to 12 basis points. However, investors do not blindly trust name changes: they are only willing to allocate towards and pay more for a repurposed green fund if the name change is accompanied by a reduction in the fund's portfolio carbon footprint.

Keywords: Climate finance, impact investing, mutual funds, greenwashing.

JEL: G11, G12, Q54.

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1 Introduction

Sustainable investments have grown tremendously in popularity over the recent decade. A total of \$35 trillion in global assets are now managed sustainably (GSIA, 2021). Moreover, assets represented by signatories to the UN Principles for Responsible investment have grown fivefold over the period from 2010 to 2020, from \$21 trillion to over \$105 trillion UNPRI (2021). Yet this rising popularity has been met with criticism too.[1] Tariq Fancy, a former executive at BlackRock, made headlines claiming that sustainable investing is a "*dangerous placebo that harms the public interest*" and that it is a way for the investment industry to improve profits.[2] A dominant share of sustainable investments are managed with environmental considerations in mind. Our study examines how these "green" preferences[3] shape investor's mutual fund investor's decision-making, and how managers of green mutual funds respond to such preferences.

In the first part of this paper we quantify the "green fund fee premium", that is, the fact that for two funds that are similar in all aspects except for their green mandate, the fund that is green tends to charge higher fund fees. We empirically estimate that the average green mutual fund manager charges 5 to 10 basis points higher fund fees. This "greenium" is highest for funds investing in a low-carbon portfolio. For such funds, investors seem willing to pay up to 2 basis points for each million ton CO_2 reduction.

In a second analysis, we exploit a setting where mutual fund managers decide to repurpose their funds into a seemingly greener mandate, by including terms in their fund name that signal green and environmental motivations. We find that investors respond highly favorably to such name changes: the funds that adopt a green name are met with 3.6%-point higher flows in the quarter immediately following the name change than otherwise similar funds that did not adopt the name change. This effect persists over the longer term, as even three years after the name change the cumulative flows into name-changing funds largely surpass those into non-name-changing funds. Yet investors do not blindly follow green name changes. When we condition our analysis on funds that decarbonised their portfolios following the name change and those that did not, we find that our results are entirely driven by decarbonising funds. These findings suggest that funds do not only look at labels but also consider more detailed, portfolio-level information when they decide to act on their green preferences.

Our findings indicate that fund managers strategically exploit increased demand for green investment in an attempt to grow assets under management and increase fund fees. Funds that repurpose into

[1] See, for example `https://www.wsj.com/articles/esg-green-funds-cost-three-times-more-than-you-think-11675441245`

[2] Fancy's original essay is available at `https://medium.com/@sosofancy`

[3] In this paper, we refer to as "green" anything related to the 'E' component of ESG). With this, we mean any aspect that relates to the environment, climate, low-carbon transition, etc. Table 7 in the Appendix provides a full list of keywords that we consider green.

green funds are generally older, smaller, and have recently experienced lower flows. One year after the name change, the average repurposed green funds increased fees by 5 basis points, and this grows to 10 and 12 basis points 2 respectively 3 years after the name change.

1.1 Related literature

A large literature has emerged in recent years that seeks to quantify a *green premium*, that is, a tendency for green assets to underperform their brown counterparts. The green premium can be regarded a 'hidden cost' of sustainable investing, as it signals green investors' willingness to accept lower returns in return for holding green assets. Mainly for equity assets, several studies have theoretically proven (e.g. Pástor et al. 2020; Oehmke and Opp 2022; Pedersen et al. 2021) or empirically shown (e.g. Bolton and Kacperczyk 2021b,a; Alekseev et al. 2022; Bauer et al. 2022; Huij et al. 2022) the underperformance of greener assets. Investors in green mutual funds may additional face 'costs' due to being underdiversified in their portfolio allocation (see, e.g., Ceccarelli et al. 2021; Geczy et al. 2021).

Our study focuses on a more direct cost associated to sustainable investing: the fee premium charged by sustainable investment funds. There are several reasons to believe that green funds charge higher fees. First, mutual fund providers might face costs in acquiring, analysing, implementing, and reporting on green sustainability criteria (Darpeix and Mosson, 2021; ESMA, 2022a). Second, there might be 'skill' in sustainable investing, for which mutual fund investors are willing to pay. Such skills might manifest in an ability to pick investments best suited for a low-carbon transition, or in devising a climate hedge portfolio that performs well in times of rising uncertainty regarding the climate. Third, fund managers might simply be exploiting the stark increase in interest for sustainable investments that has occurred in the past years (see, e.g., Hartzmark and Sussman (2019); Ceccarelli et al. (2021)), without offering much – or anything – in return. Such a strategy might work since investors with green preferences may believe that green investments will outperform over time, or they might be less attentive to fund fees given that they tend to be less financially motivated (Bollen, 2007; Engler et al., 2023).

The relatively few empirical papers that exist on this topic come to contradicting conclusions. The European Securities and Markets Authority (ESMA) has reported on the pricing of ESG funds in the European Union (ESMA, 2022a,b). According to ESMA, the average ESG fund is cheaper by 30 bps per year compared to its non-ESG equivalent. Gil-Bazo et al. (2010) analyse the pricing of socially responsible investment (SRI) funds. They find that various fund offerings by the same manager, SRI-labeled funds tend to charge lower fees. Relatedly, Darpeix and Mosson (2021) document that in the French mutual fund market, share classes taking into account non-financial considerations are on average 17 bps cheaper in annual expense ratios compared to conventional share classes. A report by Johnson and DiBenedetto (2020), however, comes to a different conclusion. Morningstar-labeled sustainable funds were on average 20 bps more expensive in 2020. In a recent study, Baker et al. (2022) find that investors are willing to pay about 20 bps more for an ESG mandate, with the point estimate having risen significantly at the end of the study's sample period.

Our paper adds to the literature on investor's willingness-to-pay for sustainable investments, which has been investigated in experimental settings. In a seminal paper, Riedl and Smeets (2017) conclude that the decision to invest in sustainable mutual funds is primarily driven by investors' intrinsic social preferences. Investors are willing to pay higher management fees for SRI investments, even though most of them expect SRI funds to underperform. Laudi et al. (2021) find that investment advisors charge a premium of between 5 and 8.3 basis points to investors with sustainable preferences. They do not exert more effort for these clients, as they spend less time and consider less information when advising SRI clients. Critically, investment advisors only charge a premium to SRI clients when these clients are less financially literate. These findings rule out higher effort as a potential explanation for the sustainability premium, and instead, point towards advisors employing price discrimination due to the belief that they can charge higher fees to sustainably-motivated clients. Engler et al. (2023) conduct a large-scale online experiment and observe that investors pay higher fees for sustainable investments because they have sustainable preferences and because they are less financially literate, therefore underestimating the impact of fees on their returns. Heeb et al. (2022) find that investors are willing to pay for impact, but that willingness-to-pay for investments does not scale linearly with their impact.

Our work also fits into an emerging body of work that more generally studies how nascent green preferences have an impact on the mutual fund market. Early works in this regard are by Bollen (2007) and Renneboog et al. (2011), who both document that flows into sustainable mutual funds respond more positively to recent outperformance, and less negatively to recent underperformance. Van der Beck (2021), Baker et al. (2022), and Ceccarelli et al. (2021) report that green labels are important in driving mutual fund investors' allocation decisions. Sustainably-labeled mutual funds experience vastly larger inflows than the control group over both papers' sample periods. Hartzmark and Sussman (2019) additionally find that around the implementation of the Morningstar Sustainability Ratings, funds rated highly by Morningstar received larger inflows. Ceccarelli et al. (2021) study a related setting and come to similar conclusions. Huynh et al. (2021) report that after experiencing local air pollution, sustainable mutual fund managers tend to divest from pollutive fund holdings. Anderson and Robinson (2019) find that in the wake of heatwaves, investors concerned about climate change reallocate their investment portfolios toward greener assets.

Lastly, our paper contributes to a literature that studies how mutual fund investors respond to information conveyed in mutual fund names. A seminal paper in this literature is by Cooper et al. (2005), who document that after name changes toward popular investment styles, funds experience above-average net inflows of 28% in the following year. A key finding by Cooper et al. (2005) is that investors irrationally follow the name change, irrespective of whether the fund's holdings match the investment style implied by the fund's name change. El Ghoul and Karoui (2021) and Van der Beck (2021) conduct a similar analysis for ESG-related fund names. Both authors document substantial net inflows into funds that include ESG-related keywords in their fund names. El Ghoul and Karoui (2021) provide evidence that investors do not respond as favorably to 'cosmetic' changes; the increase in flows is more prominent for funds that also reported higher portfolio turnover, meaning these funds implemented the change by actively trading to replace portfolio holdings. Allard et al. (2020) focus specifically on misinforming fund names, where the fund's implied investment style does not correspond with its portfolio holdings. Allard et al. (2020) report inferior investment performance, reduced inflows, and higher risk-taking for funds that deviate from an investment style implied by the fund's name. Espenlaub et al. (2017) look at name changes that occur for no fundamental reason. The authors observe that misinformation in fund names frequently occurs, despite efforts by the SEC to tackle this practice. Espenlaub et al. (2017) further document that investors do respond to superficial fund name changes by directing flows towards these funds, even though they do not gain via increased performance or lower fees.

2 Data and Sample Construction

2.1 Mutual fund data

We download mutual fund share class-level characteristics and performance data from the Center for Research in Security Prices (CRSP) Survivorship Bias Free Mutual Fund Database through Wharton Research Data Services (WRDS). In particular, we retrieve quarterly total net assets (TNAs), expense ratios, management fees, 12b1 fees[4], turnover ratios, fund common and preferred equity holdings, fund names, fund company names and codes, fund and fund company inception dates, index and ETF fund flags, and CRSP objective codes for all domestic and foreign equity and mixed mutual funds with substantial equity holdings.[5] We remove fund share classes that originated less than a

[4]The 12b1 fee is a charge deducted from the fund's assets to cover the costs of distribution and marketing.

[5]Whose CRSP objective codes start with `E` or `M`, but excluding 'hedged' and 'short' funds with respectively `EDYH` and `EDYS` objective codes. For mixed mutual funds, we follow Kacperczyk et al. (2008) and require the portfolio's equity holdings to lie between 80% and 105%.

year ago and which managed less than $10 million at the end of the previous quarter, to avoid issues with incubation bias (see, e.g., Evans 2010; Döttling and Kim 2022). We download information from mutual fund prospectuses (form 497) and prospectus amendments and summaries (forms 497J, 497K, and 497E) from the SEC's Electronic Data Gathering, Analysis, and Retrieval (EDGAR) system to supplement missing information in the CRSP Mutual Fund Database. Specifically, we fill missing expense ratios, management fees, 12b1 fees, and turnover ratios with values reported to the SEC.[6] We merge information obtained from EDGAR to our sample using the fund's share class ticker which is reported in both data sources.[7]

Observations in the CRSP Mutual Fund Database are recorded at the share class level. To conduct our analysis at the fund level we have to aggregate over all the share classes in a fund. We rely on a similar procedure as Carhart (1997) to link share classes to funds. For each `crsp_fundno` in our dataset: (i) we try to obtain the WFICN identifier from Russ Wermers' (2000) Mutual Fund Links (MFLINKS); (ii) if a WFICN is not available, we use the CRSP Shareclass Group identifier[8]; (iii) if both the WFICN and CRSP group number are missing, we use the CRSP portfolio number[9]; (iv) if none of the other identifiers are available we treat the share class as an individual mutual fund. We sum Total Net Assets (TNA's) over share classes in the same fund at the same point in time. For other variables that vary at the share class level, we calculate weighted averages, where the weights are determined by the share class' TNA divided by the fund's TNA. For other variables, we take the value that applies to the oldest share class. We count the number of share classes within a fund and include it as a control variable.

We additionally obtain front-load and rear-load fees for the fund share classes in our sample via the corresponding tables in the CRSP Mutual Fund files. As load fees often depend on the size of the investment and the holding period, we rely on several assumptions to estimate "representative" load fees. For front-end loads, we calculate a weighted average front-end load for three investor types: small investors with $100k invested, medium-sized investors with $1 million invested, and large-sized investors with $10 million invested. We rely on a similar procedure to calculate rear-end loads, but now select appropriate loads that correspond with a short holding period of 6 months, a longer holding period of 2 years, and a long holding period of 5 years. For both front-load and rear-load fees, we use the equally-weighted means over the three investment types. As for the other variables in our sample, we transform share class-level load fees to fund-level load fees by taking weighted averages

[6]Starting in 2010, the SEC mandates mutual fund prospectuses to be reported in eXtensible Business Reporting Language (XBRL) format which makes it possible to automatically extract the required information. Hence, this supplemental information is available for funds as of 2010, and earlier for a select few prospectuses that were already reported in XBRL before the SEC mandated this.

[7]For a very small number of funds for which the share class ticker is unknown we rely on approximate string matching on the funds' names.

[8]Denoted in CRSP by `crsp_cl_grp`

[9]Denoted in CRSP by `crsp_portno`

over all share classes. Lastly, we calculate the variable *Total Expense Ratio* (TER, in percentages) by summing fund-level expense ratios, front-loads, and rear-loads. We believe that the TER depicts most accurately the fees incurred by mutual fund investors, and thus use it as both our variable of interest when we are interested in assessing the fee premium, and as a control variable in other types of analyses.[10]

2.2 Mutual fund flows

To calculate fund flows we start by downloading monthly, shareclass-level TNAs and returns from the CRSP mutual fund database. We compute mutual fund flows by:

$$\text{Flow}_{it} = \frac{\text{TNA}_{it} - \text{TNA}_{it-1}(1 + r_{it})}{\text{TNA}_{it-1}}, \tag{1}$$

where TNA_{it} and TNA_{it-1} are the fund i's total net assets in the months t and $t-1$; and r_{it} is the fund's gross return. Flows are winsorised at the 1$^{\text{st}}$ and 99$^{\text{th}}$ percentiles to minimise the impact of outliers and data errors. We aggregate flows to the quarterly frequency and sum flows within a fund to match the granularity of our data set. In our analyses, we additionally make use of cumulative flows and returns accumulated over periods up to 4 quarters (1 year) into the past and up to 12 quarters (3 years) into the future.

2.3 Mutual fund holdings

To accurately assess how mutual funds are performing on environmental aspects we analyse fund's reported holdings and map them to several variables related to emissions and ESG. For all funds in our sample, we obtain portfolio holdings from the CRSP mutual fund holdings database. We download holdings as of the fourth quarter in 2007 due to reasons of data quality in the CRSP Mutual Fund holdings database (as reported by Schwarz and Potter 2016) and due to the limited availability of ESG scores and emissions prior to this period. To further mitigate concerns around data quality, we remove (i) fund observations whose reported holdings sum to less than 75% or more than 125%, and (ii) funds that have holdings whose absolute weights make up more than 25% of the portfolio's TNA, as in Artiga González et al. (2021).[11] Besides calculating portfolio-level emissions levels and ESG scores (see Section 2.4 for details), we construct several other variables from these mutual fund holdings.

[10]It is important to note that front-load and rear-load are generally small in comparison to other fees levied, especially so at the end of our sample period. Our results, therefore, remain qualitatively similar when we do not use the Total Expense Ratio but the Expense Ratio (that is, without load fees) as the dependent or independent variable.

[11]On average we drop 1.2% of the observations in each year, much more in the first years than in the last years of our sample.

First, we count the number of holdings for each fund portfolio and include it as a proxy for portfolio diversification. Second, we merge holdings data with end-of-previous year market capitalisations from Refinitiv Eikon and take a weighted average over the portfolio to proxy for the size of the average stock in which the portfolio is invested. This variable is associated with the liquidity and investability of the fund's portfolio and is thus important for determining fees, as funds invested in large and liquid assets generally charge lower fees. Third, we calculate a measure of portfolio sector concentration, which reflects how a portfolio is diversified over the 12 GIC sectors:

$$\text{Portfolio Sector Concentration}_{it} = \sum_{s=1}^{12} w_{ist}^2 = \sum_{s=1}^{12} \left(\sum_{j=1}^{N} w_{ijt} \mathbb{I}(\text{sector}_j = s) \right)^2, \tag{2}$$

where w_{ist}^2 is the squared weight of GIC sector s in portfolio i at time t; w_{ijt} is the weight of holding j in the portfolio i at time t; and $\mathbb{I}(sector_j = s)$ equals 1 if holding j belongs to GIC sector s and 0 otherwise. Portfolio Sector Concentration is similar to a Herfindahl-Hirschman index and approaches 0 if the portfolio is widely diversified across the sectors and 1 when the portfolio is solely invested in a single industry sector.

2.4 Green labels, emissions, and ESG-scores

Green fund labels. We rely on two methods to label green funds: (i) "self-labeled" green funds which are defined by whether or not the funds' name includes any of the sustainability-related terms in Table 7 in the Appendix; and (ii) "Morningstar-labeled" green funds which are funds classified as sustainable by Morningstar and were obtained from Morningstar's Sustainable Fund Flows reports.[12]

Portfolio emissions and ESG-scores. We gather ESG-scores and emissions and intensities data from 8 different providers: Asset4 (ESG-scores and emissions), FTSE (ESG-scores), MSCI (ESG-scores, emissions, and emission intensities), Refinitiv (ESG-scores and emissions), RepRisk (RepRisk Reputation Index, similar to an ESG-score), S&P Global (ESG-scores), Trucost (emissions and emission intensities), Sustainanalytics (ESG-scores and Emissions), and TruValue Labs (ESG-scores). All emissions variables denote combined scope 1& 2 emissions. For some emissions providers, we do not obtain emission intensities. For these providers, we use revenues downloaded from Refinitiv Eikon and calculate emission intensities ourselves.[13] To ensure comparability between ESG scores we first reverse scores by RepRisk and Sustainalytics so that higher scores indicate better ESG performance, and then rescale all ESG scores so that they take values from 0 to 100. We merge this information

[12]See, for example, `https://www.morningstar.com/lp/global-esg-flows`

[13]For Trucost and MSCI we obtain emissions and intensities. The intensities obtained via these providers and those calculated ourselves are over 99% correlated.

to the universe of all securities in the CRSP Holdings database, using either `GVKEYs`, `ISINs`, and `CUSIPs` as identifier variables. Lastly, we calculate averages of emissions, emission intensities, and mean ESG scores for each at the security-by-year level. This allows us to make maximum use of the coverage in our ESG and emissions variables and minimise issues with inconsistencies present in the data as reported by, for example, Berg et al. (2022a), Berg et al. (2022b), and Busch et al. (2018).

We then calculate portfolio-level ESG scores, emissions, and emission intensities according to the following aggregation:

$$S_{it} = \sum_{j=1}^{N_i} w_{ijt} S_{jt}, \tag{3}$$

where S_{it} is the portfolio i's ESG, emission, or intensities' value at time t, w_{ijt} is the weight of holding j in the portfolio i at time t; and S_{jt} is the individual portfolio holding j's ESG or emissions value at time t. Note that due to missing values, not all holdings j in fund i at time t are associated with an S_{jt}. We mitigate this issue in the following way. For each variable S, we calculate its coverage by summing the weights w_{ijt} only over the non-missing values: $\sum_{j=1}^{N_i} w_{ijt} \ \forall \ w_{ijt} \mid S_{jt} \geq 0$, and then normalising the portfolio-average S_{it} by this coverage, thereby implicitly assuming that the non-missing part of the portfolio has a similar S_{jt} as the missing part.[14] This assumption might be overly restrictive for funds with many missing variables. Hence, we require the coverage for each variable to amount to at least 30%, below which level we return missing variables for S_{it}.

We proceed by transforming mean portfolio emission and mean portfolio intensities into two portfolio-level green fund indicators. We set the variable *Low Carbon Emissions* equal to 1 if the fund's portfolio emissions are in the bottom 30% compared to that of other funds in the same CRSP objective code and otherwise equal to 0. We employ the same transformation for the variable *Low Carbon Intensity*, which equals 1 when the fund's portfolio intensity ranks in the bottom 30% of its fund style group.[15]

Table 9 presents portfolio-level, pairwise correlations for the ESG and emissions variables used in our analysis. The table reports generally high correlations between portfolio-level emissions obtained from any of the 5 providers, with the lowest correlations between Sustainalytics' and MSCI's emissions at 78%. All portfolio-level emissions are above 85% percent correlated with the mean across providers. The table further shows lower and *much* less consistent pairwise correlations between different portfolio-level ESG variables. Although reported at the portfolio level rather than at the holdings level, these numbers are grossly consistent with Berg et al. (2022a). None of the individual

[14] We normalise portfolio-level variables in this way to make sure that our calculated portfolio-level variables are free from biases due to coverage. If we would not do this, emerging market funds, for example, would mechanically have lower emission intensities than developed market funds, purely because a greater part of their portfolio holdings is missing intensities.

[15] In unreported results, we also test a stronger definition of these variables, where they rank among the bottom 10%. Our findings are stronger for this more restrictive definition.

portfolio ESG scores has a correlation above 35% with the mean across providers. Interestingly, the correlation between emissions and ESG tends to be positive: the cross-provider mean emissions and the cross-provider mean ESG score is 32% correlated. This observation stems from the strong size bias present in ESG ratings, combined with the fact that larger firms naturally tend to be larger emitters.

2.5 Summary statistics

Table 1 reports descriptive statistics for the funds and variables used in our analysis. Our main sample consists of about 180k quarterly fund observations, starting in the fourth quarter of 2007 and ending in the fourth quarter of 2022. The mean (median) fund in our sample charges 1.36% (1.14%) in annual Total Expense Ratios. The mean quarterly gross return is about 2%. The median fund in our sample has experienced net outflows, about -1.12% quarterly to -12.59% cumulatively over 3 years. The representative fund manages $2.8 billion, though there is significant positive skew in the funds' TNAs. A little over 20% of the funds in our sample are index funds or ETFs, and about 50% of the assets managed belong to institutional investors. About 1% to respectively 3% of the funds in our sample are labeled green by the fund's managers or by Morningstar. The mean fund in our sample has a portfolio carbon footprint of 5.6 million tonnes of CO_2-equivalents, and portfolio emission intensities of 285 tonnes CO_2-e per million US$ revenue (at the holdings level).

Figure 1 plots the combined Total Net Assets, combined quarterly fund flows, and the number of funds in our sample over time. Panels B and C of Figure 1 report the same information but for the subsamples of funds with respectively green labels by Morningstar and green names. Several observations stand out from the figure. First, while combined flows are mostly negative in the second half of our sample for the aggregate mutual fund industry, both green-labeled and green-named mutual funds have been met with relatively consistent net inflows. Second, a relatively similar number of funds are labeled green or named green. Growth in the number of green mutual funds is stronger than for the general sample, suggesting that newly founded funds are more often green, that funds repurpose into green funds, or that both effects occur. Third, the overall size of the average green mutual fund is rather limited, with about 1% of total assets invested in green mutual funds at the end of our sample.

We provide preliminary evidence for a "green fund fee premium" in Figure 2, which plots TNA-weighted average Total Expense Ratios (TERs) for the funds our sample, split by all funds, Morningstar-labeled green funds, and self-labeled green funds. The figure shows that over the majority of the sample period, the average green investor incurs higher fees than the average non-green investor, with the difference being largest for funds that are self-labeled green by their fund names. Figure 2 also strikingly shows the dramatic reduction in average expense fees over time. Table 8 further provides evidence of how fund expense ratios vary over CRSP objective codes. From the table it can also be seen that about 5% of the variation in expense ratios and about 10% of the variation in management fees is explained by fund investment style codes, motivating our choice in later regression specifications to include fund style fixed effect to any regression with fund fees as the dependent variable.

3 The green fund fee premium

3.1 Do green funds attract more flows?

We start our analysis by examining whether green funds attract larger flows. To do so, we estimate:

$$\text{Flow}_{it} = \alpha + \beta\ \mathbb{I}[\text{Green Fund}]_{it} + \gamma\ X_{it-1} + \sigma_{it} + \mu_i + \epsilon_{it}, \qquad (4)$$

where Flow_{it} is fund i's flow in quarter t as calculated in Equation (1); $\mathbb{I}[\text{Green Fund}]_{it}$ is an indicator variable equal to 1 if fund i at time t has (i) a green fund name, (ii) a green Morningstar label, (iii) a low-carbon portfolio, or (iv) a low-carbon-intensity portfolio; X_{it-1} controls for (lagged) fund characteristics, including the fund's total expense ratio, its size, and past-year and past-quarter fund performance; σ_{it} is a quarter $\times$ fund style fixed effect; and μ_i is an optional fund company fixed effect. Our interest lies in the β coefficient, as it indicates the additional flows (in percentage points) into green mutual funds in excess of the flows into funds with similar investment objective at the same point in time, but without a green label or mandate. When Equation 4 additionally includes a fund company fixed effect, the interpretation of β changes to the additional flows experienced by green funds in comparison to non-green funds that are managed by the same mutual fund company at the same point in time with similar investment objectives.[16]

Table 2 reports the estimated coefficients from Equation 4. All three types of green funds tend to attract higher flows. The effect is most pronounced for funds that are labeled green by Morningstar. The

[16]Since our identification relies on variation in $\mathbb{I}[\text{Green Fund}]_{it}$ *within* the fixed effects, one might worry if enough observations remain in our extended specifications for credible inference. We do not deem this problematic, however. Using *Green Fund Name* as our variable for $\mathbb{I}[\text{Green Fund}]_{it}$ for example, gives us 1583 green observations without the inclusion of fixed effects. Including quarter $\times$ fund style fixed effect leaves 1580 observations, indicating that for only a few green fund observations, no non-green "matching-fund" could be found within the same style group *and* year-quarter. In the more restrictive case where we additionaly add fund company fixed effects, more observation are left unused. Even though the average fund company manages more than 7.0 funds, around 41.79% of fund companies manage only one fund. Even this case leaves 1259 observations for inference, suggesting that green funds are generally managed by larger, more diversified fund companies.

average Morningstar-labeled green fund has between 3.46%-points and 3.66%-points higher quarterly flows than a typical fund offered by the same fund company without the Morningstar label (column (4)) in Table 2. A fund with a green name on average has about 1.98%-points higher inflows. The β coefficient is lower for funds that have low carbon footprints but still significantly positive. The average fund with a low carbon footprint attracts 0.43% higher inflows than its comparison fund with a higher footprint. Coefficients on control variables are in line with our expectations. Smaller, more affordable, and funds with higher recent financial performance attract larger flows. Compared to a median quarterly flow of -1.12% in our sample, the flow premia associated with being green are economically very large, amounting to between -30% and 327% of the median absolute flow (and up to 19% of a standard deviation in quarterly flows). Compared broadly, the additional flows with which the average Morningstar-labeled green fund is rewarded are roughly equal to the incremental flows associated with a 7% outperformance in the most recent quarter.[17] The values we observe are largely similar in magnitude to those reported by Baker et al. (2022) and Van der Beck (2021). A natural question we seek to answer in this paper is whether fund managers strategically exploit this strong demand for green investments: do they opportunistically repurpose into green mutual funds and do they charge a premium for catering towards green preferences?

3.2 Do green funds charge higher fees?

In this section, we quantify the "green fund fee premium" by estimating panel regressions of mutual fund fees on various proxy variables for green funds that we have introduced so far. As explanatory green fund variables we employ: whether the fund is self-labeled as green, whether it is labeled green by Morningstar, whether it has a low carbon emissions portfolio, and whether it has a low emission intensity portfolio. We then estimate:

$$\text{Total Expense Ratio}_{it} = \alpha + \beta\, \mathbb{I}[\text{Green Fund}]_{it} + \gamma\, X_{it-1} + \sigma_{it} + \mu_i + \epsilon_{it}, \tag{5}$$

where Total Expense Ratio_{it} is fund i's Total Expense Ratio in quarter t, $\mathbb{I}[\text{Green Fund}]_{it}$ is an indicator variable equal to 1 if fund i at time t has (i) a green fund name, (ii) a green Morningstar label, (iii) a low-carbon portfolio, or (iv) a low-carbon-intensity portfolio, X_{it-1} is a vector controlling for the fund's size, age, investor base, turnover ratio, fund structure, its number of shareclasses, number of portfolio holdings, mean holding market capitalisation, and portfolio sector concentration, σ_{it} is a quarter × fund style fixed effect, and μ_i is an optional fund company fixed effect. Our interest lies in the β coefficient, as it indicates the additional fee (in percentage points) charged for green

[17]The coefficient on $\text{Return}_{t-1,t}$ indicates that for a 1% outperformance, the average fund is rewarded with 0.51% higher flows. To be awarded 3.5% flows thus equals 0.035/0.005, hence a 7% outperformance.

mutual funds compared to their non-green counterparts with similar investment styles. When the regression includes a fund company fixed effect, the β coefficient can be interpreted as the extra fee charged by the fund company for a green mutual fund.

We report results in Table 3. Compared within fund companies, the average self-labeled green fund has a 3.56 bps higher total expense ratio, keeping all other factors constant. There is no fee premium associated with the Morningstar label. The highest "green fund fee premium" is observed for funds that invest sustainably. Funds that have a low-carbon-emissions portfolio tend to charge about 10 bps higher fees, and about 5.6 bps higher fees when we compare within fund companies. This constitutes about 10% to 5% of a standard deviation in total expense ratios. We also observe a green fund fee premium for low-intensity funds, yet it is smaller (about half in magnitude) than the premium for low-emission portfolios. Seemingly, fund management companies are able to levy the highest fee premium for emission reductions. The difference in portfolio footprints between the average low-emission and non-low-emission is about 5 million tonnes of CO_2 (6.5 million tonnes vs. 1.5 million tonnes). This suggests that for every one million tonnes reduction in portfolio CO_2 emissions, the average green investor is willing to pay between 1 and 2 additional basis points in fund fees.

4 Fund name changes

We now examine the implications of fund managers' decisions to include 'green'-related appellations in their fund name. This difference-in-differences setting allows us to infer whether or not name-changing funds are able to attract more flows and increase fund fees following the name change compared to similar funds that did not change names. In total, we observe 40 such name changes. Figure 6 in the Appendix shows that green name changes have become increasingly more common.

4.1 Characteristics of name-changing funds

As in Cooper et al. (2005), we start by examining how the characteristics of name-changing funds differ from the rest of our sample. We do so by running a logistic regression of an indicator variable equal to 1 if the fund changes its name into a greener alternative onto the following fund characteristics (observed in the previous quarter): the fund's total expense ratio, the natural log of the fund's age, the log of its total assets, the fund's investor base, whether it's an index fund, the fund's past-quarter and past-year return, and the fund past-quarter and past-year flow. Table 4 reports evidence that funds undertaking green name changes experience significantly lower flows in the year preceding the name change. Funds deciding to repurpose also tend to be smaller and older. These funds do not underperform, however. The mean name-changing fund has a 6%-points higher annual return performance than its non-name-changing counterpart. Lastly, funds that go green have lower portfolio emissions and better portfolio ESG scores already before implementing the name change. The fund's fees, the composition of its investor base, and the fund structure (whether or not it is an index fund) are not related to the decision to adopt a green fund name. These findings are generally consistent with those by Cooper et al. (2005) and El Ghoul and Karoui (2021), suggesting that the drivers to change fund names are generally similar, independent of whether the change signals environmental motivations, ESG considerations, or the chasing of a "hot" investment style.

4.2 Effect on flows

To empirically test the effect of green name changes on future flows, we estimate:

$$\text{Flow}_{it,t+q} = \alpha + \beta \, \mathbb{I}[\text{Green Fund Name}]_{it} + \gamma \, X_{it} + \sigma_{it} + \psi_i + \epsilon_{it}, \qquad (6)$$

where $Flow_{it,t+q}$ is fund i's cumulate relative flow from quarter t to $t+q$, $\mathbb{I}[Green\ Fund\ Name]_{it}$ is an indicator variable equal to 1 if fund i at time t has a green fund name, X_{it} is a vector which controls for (time-varying) variables that are known to affect flows, including the fund's size, expense ratio, past flows, and past returns, σ_{it} is a quarter $\times$ fund style fixed effect, and ψ_i is a fund fixed effect. The quarter $\times$ fund style fixed effect σ_{it} is included to control for flows that equally affect all funds in a style category at the same point in time. Inclusion of the fund fixed effect ψ_i is crucial to make the identification *within-fund*, so that the β coefficient is driven by the funds whose Green Fund Name indicator variable changes. Our interest lies in β, which can be interpreted as additional fund flows (in percentage points) accruing to a fund that changes its fund name into a green alternative, over the q quarters following the name change. The coefficient reflects an "abnormal" fund flow, i.e. a fund flow that is in excess of the fund flows experienced by a fund that is similar to the name-changing fund in terms of the characteristics included in X_{it} and its objective code, except in that it did not decide to adopt a green name.

The first 4 columns of Table 5 report the coefficients obtained from estimating regression equation (6). The table reports regression estimates using as the dependent variables the cumulative relative flows over 1, 4, 8, and 12 quarters into the future. Over all periods, the β coefficient is significantly positive. In terms of magnitude, flows into funds that have changed their names are large: in the quarter immediately following the name change, additional inflows are 4 percentage points larger for name-changing funds, which is more than three times larger (in absolute terms) than the median flow over the sample period.

Figure 3A plots the same coefficients as reported in Table 5, but for a longer period spanning the year before to the name change and the three years following it. Before the name change, we see that cumulative flows are slightly negative. The same tendency is reported in Table 4. It seems that unpopular funds decide to change their names in an attempt to recover outflows registered over the previous year. Flows are slowly growing after the change, but continue to do so even three years after, after which growth seems to slow. These findings indicate that investors seem to pay attention to greening fund names, and are willing to allocate toward funds undergoing such changes. Our next analysis will focus on whether investors blindly follow fund name changes and whether fund managers exploit this surge in investor interest by increasing their fund's fees.

4.3 Flows conditional on portfolio decarbonisation

Our analyses so far have shown that funds adopting greener-sounding names can attract substantial flows in the quarters following the name change. Cooper et al. (2005) conclude from their analysis of general name changes in mutual funds that investors are "irrationally influenced" by name changes and that they respond to similar extents to 'cosmetic' changes where the fund's behavior proves inconsistent with the implied name changes. An interesting question is thus whether these findings carry over to our setting: do funds adopting greener names always attract greater flows, irrespective of whether they invest accordingly?

This question is not easy to answer due to the lack of variables that precisely identify whether a fund is green. A rough proxy, however, is to examine the extent to which a fund improves its portfolio carbon footprint. We seek to answer this question by estimating an adoption of Equation (6) by conditioning on portfolio decarbonisation:

$$\begin{aligned}\text{Flow}_{it,t+q} =& \alpha + \beta_0\, \mathbb{I}[\text{Green Fund Name}]_{it} \times \mathbb{I}[\text{Decarbonising Fund}]_{it} + \\ & \beta_1\, \mathbb{I}[\text{Green Fund Name}]_{it} \times \mathbb{I}[\text{Non-Decarbonising Fund}]_{it} + \gamma\, X_{it} + \sigma_{it} + \psi_i + \epsilon_{it},\end{aligned} \tag{7}$$

where most variables are equal as in Equation (6), except for that we estimate two separate effects: a β_0 which reflects abnormal excess flows towards mutual funds that change their name and which *did* decarbonise their portfolios following the name change, and a β_1 which reflects abnormal excess flows towards mutual funds that change their name and which *did not* decarbonise their portfolios. We define portfolio decarbonisation by the percentage change in the fund's portfolio footprint over the year following the name change. *Decarbonising Funds* are those funds whose year-on-year portfolio's emission reduction is in the bottom 30%, while *Non-Decarbonising Funds* are those funds whose emission reduction is in the top 30%. Note that we do not define decarbonisation as an absolute measure of emission reductions per se, but as a relative measure across funds, hereby acknowledging that for some investment styles and/or for some periods in time it might be more easily or more difficult to decarbonise. Nonetheless, the mean absolute decarbonisation – that is, emission reduction in the year following the name change – amounts to about 0% in the subsample of non-decarbonising funds.

Figure 3B and columns 5 to 8 in Table 5 clearly show that the effect is entirely driven by decarbonising repurposed funds. In other words, the entire benefits of increased flows in response to green name changes accrue to those funds that at the same time incorporate emissions reductions into their portfolio holdings. Funds that did not decarbonise only have abnormal inflows in the quarter immediately following the name change, when it is too early for investors to assess whether the name change is cosmetic or real. This conclusion is at odds with those by Cooper et al. (2005). Yet it is consistent with El Ghoul and Karoui (2021)'s observation that among funds adopting an ESG mandate, the funds with higher portfolio turnover surrounding the adoption were awarded most of the higher flows. All in all, our findings seem to suggest that investors do not blindly follow a green label and that they consider detailed, portfolio-level information when evaluating the credibility of mutual fund managers' sustainability claims.

4.4 Effect on fees

Importantly, we now turn to investigate whether managers of green funds are able to benefit from this increased investor demand by strategically increasing their funds' fees. To empirically test this, we adjust Equation (6) accordingly:

$$\Delta \text{Total Expense Ratio}_{it,t+q} = \alpha + \beta\, \mathbb{I}[\text{Green Fund Name}]_{it} + \sigma_{it} + \psi_i + \epsilon_{it}. \tag{8}$$

where ΔTotal Expense Ratio$_{it,t+q}$ represents now the change in fund i's total expense ratio from from quarter t to $t+q$ and all other variables are as in Equation (6). Our interest lies in β, which can be interpreted as the increase in the fund's total expense ratio (in percentage points) over the q quarters following the name change.

The results of estimating regression Equation (8) are presented in Table 6. One year after incorporating the name change, fund fees have risen by about 4.5 bps, although the coefficient's statistical significance just fails to pass 10%. After 2 and continuing up to 3 years after the name change, name-changing funds have increased their total expense ratios by about 10 bps. This finding is economically significant, amounting to about one-quarter of the fee discount observed for the average index fund in our sample (see Table 3). Also, in this case, we find the effect is mostly driven by funds incorporating portfolio decarbonisation, even though the estimated coefficients are sometimes lacking statistical significance due to lower statistical power caused by fewer observations. Economically however the reported increases are similar in magnitude to the unconditional case. These findings are suggesting that decisions by mutual fund managers to adopt green names are motivated strategically in an attempt to capture flows and fees. Our results show that funds successfully do so once they also act on the implied name change, that is if they incorporate green consideration in their investment decisions.

4.5 Effect on other variables

Figure 4 shows mean fund characteristics *pre-* and *post-*name change. Quite strikingly, funds heavily decarbonise their portfolios after the name change. The representative name-changing fund has a portfolio footprint amounting to 5.5 million tonnes of CO_2-equivalent emissions around the name change and reduces this to less than 3 million tonnes two years later. Portfolio-average ESG scores improve by about 8%, from 63 to about 68 (on a scale from 0 to 100). These changes to the fund's portfolio lead to larger turnover, which spikes around the name change and then gradually decreases.

5 Conclusion

Our paper sheds light on how a rising trend in green investing has affected the market for U.S. mutual funds. Over our sample period, the average "green" mutual funds has been met with considerably larger flows than the average traditional fund. Our first contribution is that we provide evidence that green mutual funds tend to be more expensive in terms of the fund fees they charge. On average, the "green fund fee premium" amounts to between 5 and 10 basis points in additional fees per year. We also distinguish between different types of green mutual funds, and report the largest fee premium for mutual funds that invest in a low-carbon portfolio. Investors are willing to pay more for carbon emission reductions than for green labels (either self-labeled or classified by Morningstar) and low-intensity portfolios. Expressed in economically meaningful terms, green mutual fund investors' are willing to pay between 1 and 2 basis points in additional fees for a 1 million tonne reduction in CO_2 emissions.

Second, by exploiting a setting where mutual fund managers decide to repurpose their funds into a seemingly greener mandate, we provide evidence for fund managers' strategic behaviour in exploiting investors' green preferences. Our findings suggest that struggling funds – i.e. funds that are older, smaller, and that have experienced lower flows – are most likely to engage in the strategic decision to repurpose into green funds by adopting fund names that include green terms. We do not find, however, that funds are opportunistic in deciding to go green: most repurposing funds already had a better environmental profile before the name change, they reallocate their portfolio towards greener assets around the name change, and they continue to improve their portfolio's environmental profile after the change.

Third, our analysis shows that investors respond favourably to changes in fund names. Investors reward greening funds with large flows. This effect surfaces in the quarter following the name changes and persists over more than three years after the name change. Managers of repurposed funds furthermore benefit from increased investor interest by raising fees by about 12 basis points over the 3-year period following the name change. Contrary to prior findings, investors are not naively following fund names. Our results are not driven by "cosmetic" name changes, but rather, are entirely driven by those repurposed funds that also incorporated meaningful emissions reductions into their portfolios in the period following the name change. Hence, these findings suggest that funds do not only look at labels but also consider more detailed, portfolio-level information when they decide to act on their green preferences.

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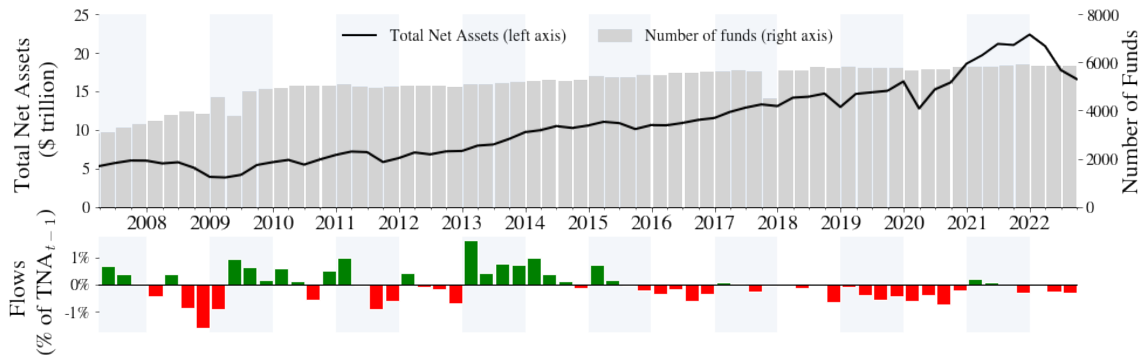
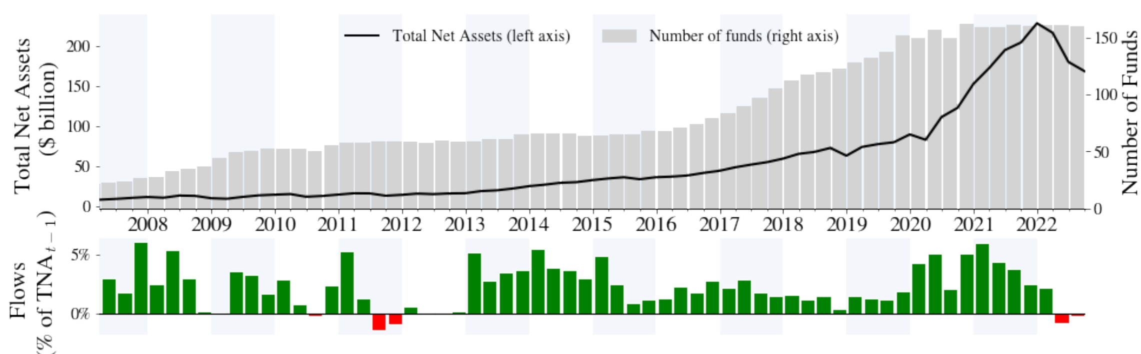
6 Figures and Tables

Figure 1: TNAs, Flows, and Number of Funds
The figure plots the total assets under management, quarterly flows, and number of funds for our complete sample (Panel A), as well as for funds with green labels (Panel B) and with green names (Panel C). Green-labeled funds are funds labeled green by Morningstar. Green-named' funds are funds whose name indicates any of the 'green' terms in Appendix A.

(a) All funds in sample



(b) Funds with green label



(c) Funds with green name

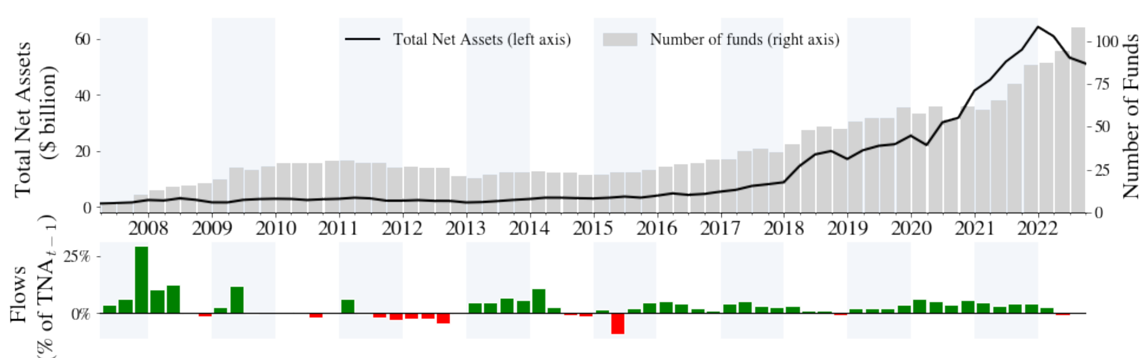


Figure 2: Total Expense Ratios over Time

The figure displays average expense ratios for the mutual and index funds in our sample. Numbers reported are value-weighted averages by fund total net assets. 'Green-labeled' funds are funds labeled green by Morningstar. 'Green-named' funds are those funds whose fund name indicates any of the 'green' terms in Appendix A. The sample period runs from 2007Q4 to 2022Q4.

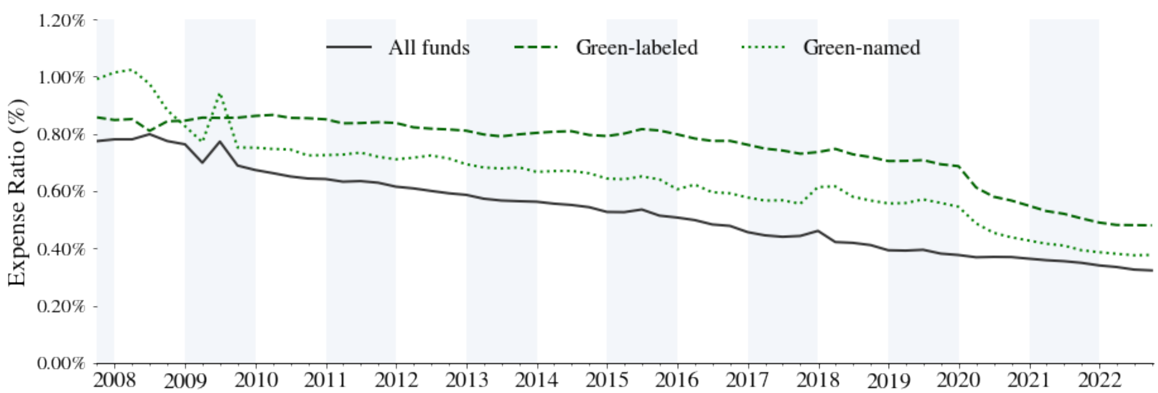
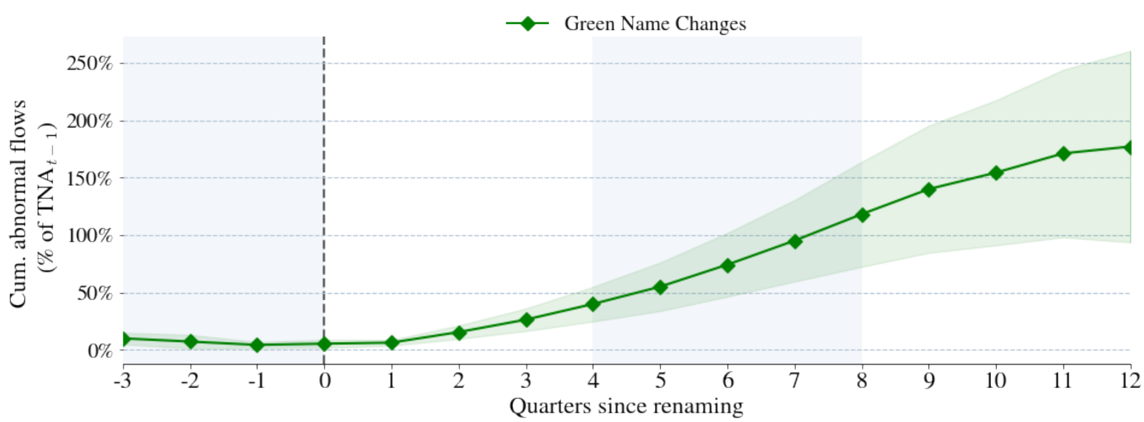


Figure 3: Flows in Response to Green Name Changes

This figure plots abnormal fund flows in response to green name changes for the 4 quarters before the fund name change up to the 16 quarters after the name change. Panel B conditions on portfolio decarbonisation. *"Decarbonising"* funds have emissions reductions in the year following the name changes in the bottom 30% of the sample. *"Non-Decarbonising"* funds have emissions reductions in the year following the name changes in the top 30% of the sample. 95% confidence intervals are indicated by the shaded areas and are based on robust standard errors clustered at the fund level.

(a) Green vs. general name changes



(b) Green name changes conditional on high vs. low portfolio decarbonisation

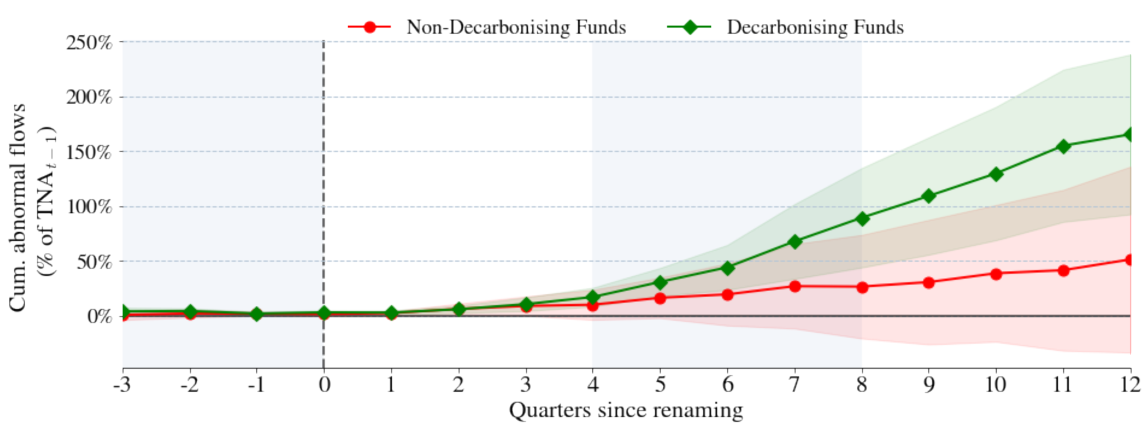


Figure 4: Other Variables in Response to Green Name Changes

This figure plots the mean of various variables 4 quarters before the fund name change and up to the 16 quarters after the name change. The variables shown are the fund's portfolio-level scope 1&2 emissions, it's portfolio level ESG-score, the fund's management fees, and the fund's portfolio turnover ratio. 95% confidence intervals around the means are indicated by the shaded areas.

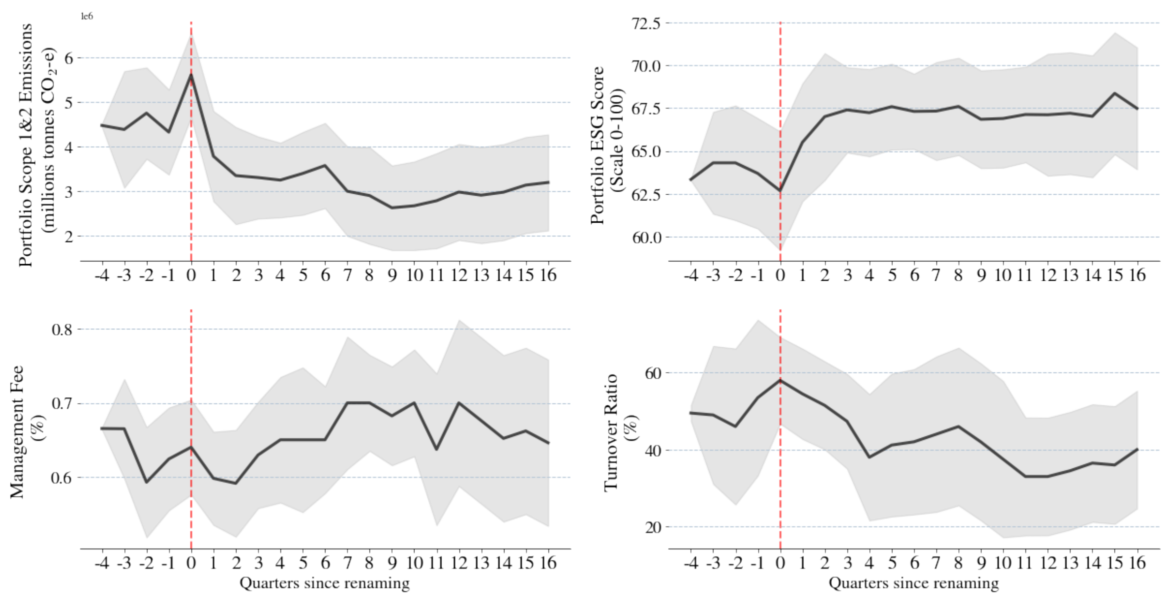


Figure 5: Fund Costs by Emissions Quintiles

This figure plots fund expense ratios and management fees by quintiles obtained from sorting on fund portfolio emissions. The mean of all available emissions providers has been used to form quintiles.

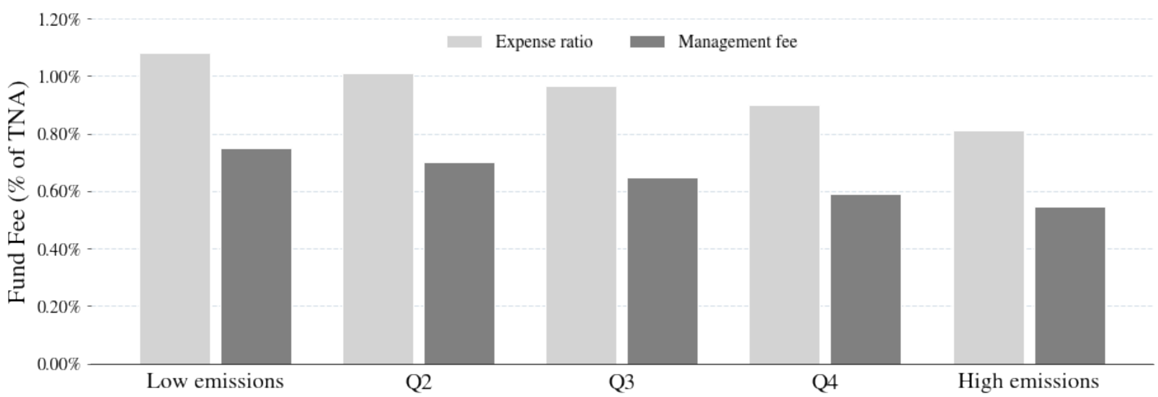


Table 1: Descriptive Statistics

This table reports descriptive statistics on the variables used in our analysis. Observations are at the fund-by-quarter level. The sample period is from 2007Q4 to 2022Q4. *Panel A* reports fund-level variables, *Panel B* reports portfolio-level variables, and *Panel C* reports environmentally-related fund and portfolio-level variables.

				Percentiles						
	N. Obs.	Mean	SD	1%	5%	25%	Median	75%	95%	99%
Panel A: Fund-level variables										
Total Expense Ratio (%)	181,603	1.36	1.01	0.03	0.14	0.63	1.14	1.82	3.49	4.51
$\text{Return}_{t,t+1}$ (%)	178,624	2.01	10.45	-27.48	-17.86	-2.49	3.19	7.88	17.18	26.76
$\text{Flow}_{t,t+1}$ (% of TNA_{t-1})	177,944	1.48	19.28	-34.99	-14.89	-4.36	-1.12	3.20	23.97	76.48
$\text{Flow}_{t,t+4}$ (% of TNA_{t-1})	161,839	8.99	80.41	-62.74	-38.09	-15.06	-4.46	11.77	87.91	268.48
$\text{Flow}_{t,t+8}$ (% of TNA_{t-1})	145,270	24.95	177.17	-81.27	-57.77	-27.12	-8.40	23.64	188.30	608.04
$\text{Flow}_{t,t+12}$ (% of TNA_{t-1})	129,766	43.05	264.01	-92.09	-71.43	-37.49	-12.59	33.34	289.86	1013.46
Total Net Assets ($ millions)	181,589	2,780	17,204	16	25	103	389	1,438	9,424	41,360
$\mathbb{I}$(Index Fund)	181,603	0.27	0.44	0.00	0.00	0.00	0.00	1.00	1.00	1.00
$\mathbb{I}$(ETF)	181,603	0.21	0.41	0.00	0.00	0.00	0.00	0.00	1.00	1.00
Fund Age (years)	181,603	15.44	12.36	1.26	2.25	6.68	13.00	20.80	35.57	66.26
Fund manager age (years)	180,470	32.53	19.70	3.24	7.24	18.45	26.83	46.06	71.15	86.01
Institutional share (%)	181,603	52.55	42.63	0.00	0.00	3.49	54.66	100.00	100.00	100.00
Panel B: Portfolio-level variables										
Turnover ratio (%)	181,602	61.45	460.99	2.00	6.00	21.00	41.00	75.00	160.71	337.00
Portfolio equity share (%)	181,603	93.97	4.59	81.03	84.20	91.53	94.95	97.36	99.79	100.01
Mean holding mkt. cap. ($ billions)	181,603	95,426	125,603	675	1,625	9,711	60,939	128,330	352,693	684,959
Portfolio sector concentration	181,603	0.24	0.23	0.00	0.11	0.13	0.15	0.20	0.95	1.00
Number of portfolio holdings	176,828	232.82	489.57	17.00	30.00	53.00	88.00	186.00	920.00	2413.46
Panel C: Portfolio-level and fund-level environmental variables										
$\mathbb{I}$(Green Fund Name)	181,603	0.01	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00
$\mathbb{I}$(Morningstar Green Label)	181,603	0.03	0.16	0.00	0.00	0.00	0.00	0.00	0.00	1.00
$\mathbb{I}$(Low Carbon Emissions)	181,603	0.26	0.44	0.00	0.00	0.00	0.00	1.00	1.00	1.00
$\mathbb{I}$(Low Carbon Intensity)	181,603	0.24	0.43	0.00	0.00	0.00	0.00	0.00	1.00	1.00
Emissions (mlns tons CO_2)	144,212	5.61	6.82	0.06	0.18	1.09	3.27	7.52	18.36	39.10
Emission intensity (tons CO_2 / $ million revenue)	144,212	285.60	326.13	17.02	35.01	97.83	185.97	334.21	891.77	2089.77

Table 2: Flows into Green Funds

This table reports quarterly relative flows to green funds in excess of flows to non-green funds. The coefficients reported are obtained by estimating Equation 4. The regression controls for lagged fund characteristics, quarter × fund style fixed effect and additionally includes fund company fixed effects. t-statistics reported in parenthesis are based on robust standard errors clustered at the fund level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Dependent variable:	Quarterly Flows (%)					
	(1)	(2)	(3)	(4)	(5)	(6)
$\mathbb{I}$(Green fund name)	0.0150**	0.0198**	-	-	-	-
	(2.029)	(2.478)	-	-	-	-
$\mathbb{I}$(Morningstar green fund)	-	-	0.0346***	0.0366***	-	-
	-	-	(6.378)	(4.836)	-	-
$\mathbb{I}$(Low carbon emissions)	-	-	-	-	0.0043***	0.0033**
	-	-	-	-	(2.847)	(2.109)
Total Expense Ratio (bps)	-0.0060***	-0.0006	-0.0059***	-0.0005	-0.0061***	-0.0007
	(-7.890)	(-0.663)	(-7.726)	(-0.528)	(-7.969)	(-0.689)
log(Total Net Assets ($ millions))	-0.0024***	-0.0028***	-0.0022***	-0.0026***	-0.0024***	-0.0028***
	(-7.040)	(-5.462)	(-6.456)	(-5.108)	(-6.808)	(-5.499)
$\text{Return}_{t-3,t}$ (%)	0.3152***	0.2752***	0.3131***	0.2736***	0.3142***	0.2747***
	(29.700)	(28.699)	(29.481)	(28.544)	(29.627)	(28.645)
$\text{Return}_{t-1,t}$ (%)	0.5062***	0.4228***	0.5045***	0.4229***	0.5055***	0.4219***
	(21.189)	(21.659)	(21.097)	(21.667)	(21.165)	(21.598)
Year-Quarter × Fund Style FE	Yes	Yes	Yes	Yes	Yes	Yes
Fund Company FE	No	Yes	No	Yes	No	Yes
N. Obs.	175,660	175,652	175,660	175,652	175,660	175,652
R^2-Adj.	0.025	0.021	0.026	0.022	0.026	0.021

Table 3: Green Fund Fees

This table reports total expense ratios (in percentages) for green funds in excess non-green funds. The regression controls for fund size, fund age, insitutional investments, turnover, index funds, number of shareclasses, number of portfolio holdings, mean portfolio holding market capitalisation, and portfolio sector concentration, as well as quarter × fund style fixed effect and additionally includes fund management fixed effects. t-statistics based on robust standard errors are clustered at the fund level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Dependent variable:	Total Expense Ratio (percentages)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
𝕀(Green fund name)	-0.0133	0.0356***	-	-	-	-	-	-
	(-0.411)	(2.556)	-	-	-	-	-	-
𝕀(Morningstar green fund)	-	-	-0.0003	-0.0020	-	-	-	-
	-	-	(-0.012)	(-0.108)	-	-	-	-
𝕀(Low carbon emissions)	-	-	-	-	0.0963***	0.0569***	-	-
	-	-	-	-	(14.302)	(11.491)	-	-
𝕀(Low carbon intensity)	-	-	-	-	-	-	0.0524***	0.0313***
	-	-	-	-	-	-	(8.602)	(7.154)
log(Total Net Assets ($ millions))	-0.0868***	-0.0468***	-0.0868***	-0.0468***	-0.0858***	-0.0463***	-0.0869***	-0.0468***
	(-34.995)	(-24.035)	(-34.959)	(-24.047)	(-35.151)	(-24.035)	(-35.202)	(-24.089)
log(Fund age (years))	0.0503***	0.0165***	0.0503***	0.0165***	0.0482***	0.0152***	0.0495***	0.0156***
	(8.795)	(3.504)	(8.798)	(3.500)	(8.522)	(3.243)	(8.689)	(3.322)
Institutional funds (%)	-0.3041***	-0.3034***	-0.3041***	-0.3034***	-0.3067***	-0.3068***	-0.3042***	-0.3044***
	(-28.513)	(-30.046)	(-28.501)	(-30.040)	(-29.152)	(-30.609)	(-28.679)	(-30.241)
Turnover ratio (%)	0.0006***	0.0004***	0.0006***	0.0004***	0.0006***	0.0004***	0.0006***	0.0004***
	(9.008)	(6.865)	(9.001)	(6.864)	(9.060)	(6.896)	(9.023)	(6.864)
𝕀(Index fund)	-0.3961***	-0.3719***	-0.3962***	-0.3719***	-0.3894***	-0.3707***	-0.3920***	-0.3709***
	(-35.158)	(-32.391)	(-35.114)	(-32.341)	(-34.891)	(-32.615)	(-34.855)	(-32.407)
Number of shareclasses	0.0263***	0.0292***	0.0263***	0.0292***	0.0271***	0.0292***	0.0266***	0.0291***
	(15.333)	(12.695)	(15.329)	(12.694)	(15.998)	(12.926)	(15.607)	(12.739)
log(Number of holdings)	-0.0299***	0.0239***	-0.0299***	0.0239***	-0.0266***	0.0252***	-0.0263***	0.0258***
	(-7.569)	(6.822)	(-7.571)	(6.823)	(-6.795)	(7.270)	(-6.544)	(7.327)
log(Mean holding mkt. cap. ($ billions))	-0.0022	-0.0075***	-0.0022	-0.0075***	0.0050	-0.0041	-0.0040	-0.0085***
	(-0.617)	(-2.654)	(-0.616)	(-2.653)	(1.490)	(-1.469)	(-1.163)	(-3.028)
Portfolio sector concentration	0.0194	0.0235	0.0195	0.0235	0.0157	0.0219	0.0175	0.0224
	(1.332)	(1.312)	(1.331)	(1.312)	(1.424)	(1.331)	(1.367)	(1.321)
Year-Quarter × Fund Style FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Manager FE	No	Yes	No	Yes	No	Yes	No	Yes
N. Obs.	189,767	189,767	189,767	189,767	189,767	189,767	189,767	189,767
R^2-Adj.	0.426	0.236	0.426	0.235	0.426	0.235	0.426	0.235

Table 4: Logistic regression: Characteristics of Name-Changing Funds
This table reports estimated coefficients of logistic regressions of the form

$$\mathbb{I}(\text{Green Name Change})_{it} = \alpha + \beta\, X_{it-1} + \sigma_{it} + \epsilon_{it}$$

where $\mathbb{I}(\text{Green Name Change})_{it}$ equals 1 if fund i undertakes a green name change in quarter t, X_{it} is a vector of potentially explanatory variables for the green name change, including the fund's fee, age, size, investor base, whether or not it is an index fund, past-quarter and past-year returns, past-quarter and past-year flows, its portfolio's emissions and its portfolio's ESG score, and σ_{it} is a year-quarter × fund style fixed effect. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Dependent variable:	$\mathbb{I}$(Green Name Change)	
	(1)	(2)
Total Expense Ratio (bps)	0.195	0.229
	(0.1836)	(0.1870)
log(Fund age (years))	0.494*	0.517*
	(0.2652)	(0.2693)
log(Total Net Assets ($ millions))	-0.347***	-0.340***
	(0.1120)	(0.1119)
Institutional funds (%)	0.399	0.498
	(0.4808)	(0.4850)
$\mathbb{I}$(Index fund)	-0.422	-0.496
	(0.5675)	(0.5842)
$\text{Return}_{t-3,t}$ (%)	6.415***	6.377***
	(1.7881)	(1.8427)
$\text{Return}_{t-1,t}$ (%)	-0.621	-1.644
	(4.3851)	(4.3314)
$\text{Flow}_{t-4,t}$ (%)	-3.605***	-3.682***
	(1.3928)	(1.3803)
$\text{Flow}_{t-1,t}$ (%)	0.017	0.015
	(0.0644)	(0.0648)
log(Mean Emissions S1&2)	-	-0.326**
	-	(0.1557)
Mean ESG score	-	0.038**
	-	(0.0185)
Year-Quarter × Fund Style FE	Yes	Yes
N. Obs.	173,514	151,548
Pseudo R^2	0.133	0.151

Table 5: Effect of Green Name Changes on Cumulative Future Flows
This table reports coefficients obtained from estimating regression equation 7. "Decarbonising Funds" are funds that have the highest 30% of portfolio emission reductions in the year following the name change, while "Non-Decarbonising Funds" are funds that have the lowest 30% of portfolio emission reductions in the year following the name change. The regression controls for fund size, expense ratio, past (pre-change) flows, past returns, as well as quarter × fund style fixed effects and fund fixed effects. t-statistics based on robust standard errors are clustered at the fund level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Dependent variable:	Cumulative $\text{Flow}_{t,t+q}$							
Quarters ahead:	1Q	4Q	8Q	12Q	1Q	4Q	8Q	12Q
$\mathbb{I}$(Green Name Change)	0.0606***	0.3975***	1.1808***	1.7704***	-	-	-	-
	(4.718)	(5.156)	(5.051)	(4.160)	-	-	-	-
$\mathbb{I}$(Green Name Change) × $\mathbb{I}$(High Decarbonisation)	-	-	-	-	0.0176**	0.1329***	0.9035***	1.6276***
	-	-	-	-	(2.047)	(2.706)	(3.955)	(4.638)
$\mathbb{I}$(Green Name Change) × $\mathbb{I}$(Low Decarbonisation)	-	-	-	-	0.0226**	0.1071	0.3105	0.5768
	-	-	-	-	(2.349)	(1.241)	(1.131)	(1.118)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Quarter × Fund Style FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N. Obs.	169,723	156,995	140,665	125,424	138,358	126,599	111,420	97,197
R^2-Adj.	0.009	0.003	0.002	0.003	0.009	0.002	0.002	0.002

Table 6: Effect of Green Name Changes on Future Fee Changes
This table reports coefficients obtained from estimating regression equation 8. "Decarbonising Funds" are funds that have the highest 30% of portfolio emission reductions in the year following the name change, while "Non-Decarbonising Funds" are funds that have the lowest 30% of portfolio emission reductions in the year following the name change. The regression controls for fund size, pre-change expense ratio, past flows, past returns, as well as quarter × fund style fixed effects and fund fixed effects. *t*-statistics based on robust standard errors are clustered at the fund level. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Dependent variable:	Δ Total Expense Ratio$_{t,t+q}$ (percentage points)							
Quarters ahead:	1Q	4Q	8Q	12Q	1Q	4Q	8Q	12Q
$\mathbb{I}$(Green Name Change)	0.0091	0.0467	0.1024***	0.1063***	-	-	-	-
	(0.734)	(1.628)	(2.613)	(2.734)	-	-	-	-
$\mathbb{I}$(Green Name Change) × $\mathbb{I}$(High Decarbonisation)	-	-	-	-	-0.0095	0.0294	0.1292**	0.1128
	-	-	-	-	(-0.818)	(0.961)	(2.104)	(1.235)
$\mathbb{I}$(Green Name Change) × $\mathbb{I}$(Low Decarbonisation)	-	-	-	-	-0.0047	0.0202	-0.0323	-0.0113
	-	-	-	-	(-0.436)	(0.697)	(-0.635)	(-0.248)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Quarter × Fund Style FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N. Obs.	176,865	162,965	145,611	129,563	140,016	127,606	111,865	97,189
R^2-Adj.	0.002	0.001	0.001	0.000	0.002	0.001	0.000	0.000

7 Appendix

Figure 6: Frequency of Green Name Changes
This figure plots the number of funds that change their name to green in each year. A list of terms indicating green names is provided in Table 7 below.

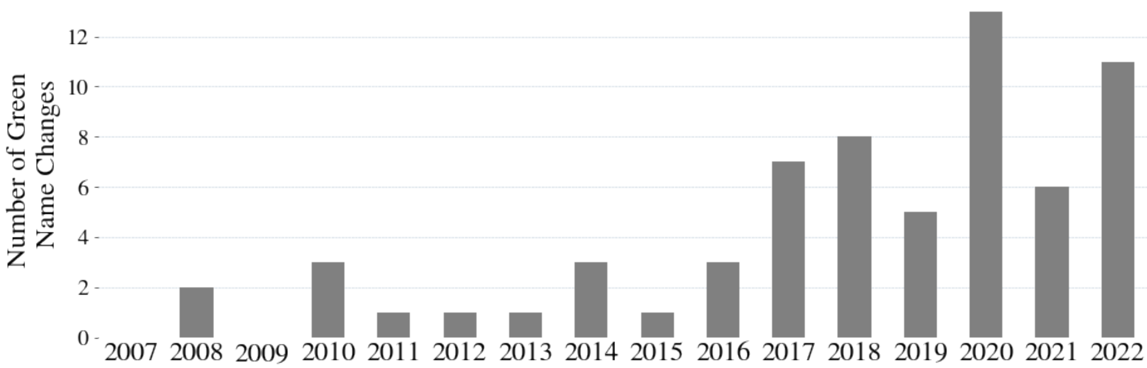


Table 7: Green Terms in Sample
This table reports a frequency distribution of green / sustainability fund name appelations. The funds names including at leas on of below temrs are labeled 'green-named' in our analysis.

Green Term	N.o. Funds with Green Term in Name	N.o. Name Changes
SUSTAINAB	57	33
CLEAN	9	0
CLIMATE	8	3
CARBON	5	1
ENVIRONMENT	4	1
TRANSITION	3	1
FOSSIL	2	0
RENEWABLE	2	0
EARTH	1	0
ECOLOG	1	0
SOLAR	1	1
WIND	0	0
GREEN	0	0
ALTERNATIVE ENERGY	0	0
ALIGNED	0	0
BETTER WORLD	0	0
WATER	0	0

Table 8: Mutual Fund Costs by CRSP Objective Code (cont'd on next page)
The table reports coefficients of regressing fund expense ratios (Specification (1)) and fund management fees (Specification (2)) on CRSP objective code dummies. t-statistics based on robust standard errors clustered at the fund-level are presented in parentheses.*, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Dependent variable:					Exp. Ratio (1)	Mgmt. Fee (2)
EDSO	Equity	Domestic	Sector	Gold	1.4584***	0.6478***
					(6.494)	(17.201)
EDSH				Health	1.0225***	0.5696***
					(8.995)	(16.092)
EDSF				Financial	1.0348***	0.5289***
					(7.915)	(15.180)
EDSN				Natural Resources	1.1130***	0.5109***
					(7.781)	(15.353)
EDSR				Real Estate	0.8122***	0.5636***
					(6.971)	(8.357)
EDST				Technology	1.1292***	0.6248***
					(11.884)	(18.798)
EDSU				Utilities	1.1253***	0.5121***
					(6.600)	(11.341)
EDSG				Consumer Goods	1.0712***	0.5118***
					(6.794)	(11.024)
EDSC				Commodities	1.2118***	0.5740***
					(2.945)	(8.315)
EDSS				Consumer Services	0.8630***	0.4415***
					(5.895)	(11.949)
EDSI				Industrials	0.7386***	0.4718***
					(8.639)	(16.497)
EDSM				Materials	0.7117***	0.4654***
					(5.986)	(10.763)
EDSA				Telecom	0.5735***	0.4334***
					(6.034)	(8.567)
EDCL	Equity	Domestic	Cap-Based	Large Cap	0.6487***	0.1524***
					(6.974)	(7.968)
EDCM				Mid Cap	1.2913***	0.6175***
					(27.516)	(40.656)
EDCS				Small Cap	1.5071***	0.7009***
					(35.250)	(54.938)
EDCI				Micro Cap	1.6469***	0.9367***
					(15.845)	(18.688)
EDYG	Equity	Domestic	Style	Growth	1.3996***	0.6025***
					(48.617)	(68.661)
EDYB				Growth & Income	1.3601***	0.5471***
					(27.826)	(37.475)
EDYI				Income	1.2883***	0.5744***
					(18.197)	(32.266)

Table 8: Mutual Fund Costs by CRSP Objective Code (cont'd)
The table reports coefficients of regressing fund expense ratios (Specification (1)) and fund management fees (Specification (2)) on CRSP objective code dummies. t-statistics based on robust standard errors clustered at the fund-level are presented in parentheses.*, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

Dependent variable:					Exp. Ratio (1)	Mgmt. Fee (2)
EFRQ	Equity	Foreign	Regional	China	1.4089***	0.7700***
					(9.966)	(19.061)
EFRM				Emerging Markets	1.5433***	0.7339***
					(19.657)	(29.802)
EFRE				European	0.7927***	0.5527***
					(10.747)	(21.135)
EFRI				India	1.2943***	0.7786***
					(5.956)	(13.118)
EFRJ				Japan	0.8769***	0.6093***
					(8.117)	(14.560)
EFRL				Latin America	0.6556***	0.5542***
					(10.689)	(18.900)
EFRP				Pacific	1.4499***	0.6289***
					(5.040)	(9.624)
EFRX				Pacific ex Japan	1.1520***	0.7242***
					(7.555)	(14.832)
EFSH	Equity	Foreign	Sector	Health	1.2615***	0.6137***
					(5.980)	(10.110)
EFSF				Financial	1.2426***	0.6330***
					(5.408)	(11.710)
EFSN				Natural Resources	1.2468***	0.6213***
					(9.323)	(18.915)
EFSR				Real Estate	2.1840***	0.6551***
					(4.415)	(5.424)
EFST				Technology	1.2119***	0.7103***
					(7.804)	(15.990)
EFSI				Industrials	1.5840***	0.6721***
					(9.775)	(20.747)
EFCS	Equity	Foreign	Cap-Based	Small Cap	1.7702***	0.8639***
					(17.079)	(26.982)
EF	Equity	Foreign	-	-	1.5269***	0.6379***
					(40.583)	(63.270)
M	Mixed Fixed Income & Equity				1.4601***	0.5399***
					(13.793)	(13.420)
N. Obs.					181,603	181,603
R^2-Adj.					0.045	0.096

Table 9: Correlations across Portfolio ESG-Scores and Emissions

This table reports correlations across portfolio-level ESG-scores and emissions. Emissions are provided by Asset4, MSCI, Refinitiv, Sustainalytics, and Trucost. All emissions numbers are Scope 1&2. Scores are provided by Asset4 (ESG Rating), FTSE (ESG Score), MSCI (IVA Industry-Weighted Rating), Refinitiv (TR.ESG), S&P Global (ESG Score), Sustainalytics (ESG Risk Rating), TruValue Labs (Insight Score), and RepRisk (Reputational Risk Index). All scores are normalised to account for differences in scaling. The signs on Sustainalytics' and RepRisk's scores have been reversed to make them similar to other providers. 'Mean' denotes the mean score of all available emissions values or ESG-scores.

	Portfolio Emissions						*Portfolio ESG-scores*								
	Asset4	MSCI	Refinitiv	Sust.	Trucost	**Mean**	Asset4	FTSE	MSCI	Refinitiv	RepRisk	S&P	Sust.	TruValue	**Mean**
Portfolio Emissions															
Asset4	1.00	-	-	-	-	**-**	-	-	-	-	-	-	-	-	**-**
MSCI	0.81	1.00	-	-	-	**-**	-	-	-	-	-	-	-	-	**-**
Refinitiv	0.85	0.89	1.00	-	-	**-**	-	-	-	-	-	-	-	-	**-**
Sustainalytics	0.78	0.85	0.79	1.00	-	**-**	-	-	-	-	-	-	-	-	**-**
Trucost	0.80	0.94	0.90	0.84	1.00	**-**	-	-	-	-	-	-	-	-	**-**
Mean	**0.85**	**0.92**	**0.88**	**0.88**	**0.92**	**1.00**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Portfolio ESG-scores															
Asset4	0.19	0.35	0.28	0.29	0.33	**0.33**	1.00	-	-	-	-	-	-	-	**-**
FTSE	-0.06	-0.17	-0.05	0.01	-0.16	**-0.19**	0.00	1.00	-	-	-	-	-	-	**-**
MSCI	-0.13	0.04	-0.06	-0.12	-0.03	**0.02**	0.49	0.17	1.00	-	-	-	-	-	**-**
Refinitiv	0.02	0.23	0.15	0.08	0.17	**0.25**	0.55	-0.06	0.54	1.00	-	-	-	-	**-**
RepRisk	-0.09	-0.35	-0.18	-0.18	-0.32	**-0.36**	-0.35	0.54	-0.15	-0.38	1.00	-	-	-	**-**
S&P Global	0.05	0.20	0.17	0.11	0.22	**0.21**	0.44	0.15	0.21	0.24	-0.17	1.00	-	-	**-**
Sustainalytics	-0.19	-0.17	-0.25	-0.32	-0.22	**-0.21**	0.19	0.13	0.44	0.11	0.07	0.10	1.00	-	**-**
TruValue	0.15	0.23	0.10	0.10	0.21	**0.23**	0.33	-0.22	0.11	0.33	-0.37	0.10	0.38	1.00	**-**
Mean	**0.06**	**0.35**	**0.26**	**0.04**	**0.32**	**0.32**	**0.63**	**-0.04**	**0.63**	**0.53**	**-0.38**	**0.44**	**0.29**	**0.43**	**1.00**