

# Saving Energy: A Decline in Active Management of ESG-oriented Mutual Funds

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August, 2025

## Abstract

This paper examines the evolution of active management among conventional and ESG-oriented U.S. equity mutual funds. While active stock-picking is considered essential for responsible investing, an analysis of 4,183 actively managed mutual funds from 2011 to 2022 reveals a general decrease in active management across all funds, with ESG-oriented funds exhibiting an additional decline after 2018. Furthermore, the study finds a notable decrease in active management relative to ESG-screened market indexes for all funds after December 2015. Using a novel decomposition of active management into fund-to-market and market-to-fund changes, the analysis shows no evidence that ESG funds have begun to align more closely with market portfolios. However, the paper finds that major market-cap-weighted S&P 500 index began to more closely mirror the portfolio compositions of ESG-oriented funds after December 2018 compared to portfolios of non-ESG funds. Moreover, increased investor flows into ESG funds appear to have weakened the previously positive link between active management and fund flows, suggesting a shift by ESG funds toward more benchmark-aligned, passive strategies under heightened investor attention. These findings suggest that the growing demand for sustainable investing, which was once mainly a focus of ESG-oriented funds, has gradually spread across the broader market, contributing both to greater alignment with ESG principles and to the reduced reliance on active management strategies within ESG-oriented funds.

**Keywords:** Mutual funds · ESG-oriented funds · Active management · Active share · Fund flows · ESG-screened indexes

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# 1 Introduction

The Paris Agreement has brought significant attention to sustainable and climate-focused investing.<sup>1</sup> This attention fueled a large number of studies, giving rise to the field of climate finance (Giglio et al., 2021). Within this literature, ESG-oriented or sustainable mutual funds have received particular focus, driven by their rapid growth in both number and assets under management. Scholars have examined their performance (Hartzmark and Sussman, 2019; Gantchev et al., 2024) and investment behavior (Li et al., 2021; Orlov et al., 2022; Y. Chen and Dai, 2023; Ceccarelli et al., 2024), with some studies criticizing these funds for engaging in greenwashing and failing to deliver on their sustainability claims (Gibson Brandon et al., 2022; Raghunandan and Rajgopal, 2022; Cocharadt et al., 2023).

However, the complexity and inconsistency of ESG information (Christensen et al., 2018; Berg et al., 2021; Berg et al., 2022) underscore the need for mutual fund managers to possess strong expertise and stock-selection skills in order to identify genuinely responsible investments. The stock-picking skills can be assessed through the degree of active management or the deviation of fund’s holdings from positions in market indexes (Cremers and Petajisto, 2009). This deviation reflects a fund manager’s deliberate decision to invest in securities outside mainstream market indexes, signaling active stock selection efforts. In the context of complexity of ESG information, it is reasonable to expect that active management or active stock picking play a particularly important role for ESG-oriented funds as they need to select truly sustainable firms.

Figure 1 illustrates the central motivation and core puzzle of this paper. The figure presents the average levels of active management<sup>2</sup> of active U.S. mutual funds from March 2011 to December 2022, separately for conventional and ESG-oriented funds. Despite the presumed importance of active management for ESG-oriented funds, the figure shows that, in recent years, these funds have exhibited a decrease in active management levels compared to non-ESG funds with similar investment objectives.

The aim of this paper is to investigate this decrease. First, using data on 4,183 U.S. equity mutual funds from the CRSP US Mutual Funds database, I estimate this decline through a panel difference-in-differences regression, comparing ESG-oriented funds to non-ESG funds with similar investment objectives. The analysis shows that while active management declined across all mutual funds following both December 2015 and December 2018, ESG-oriented funds experienced an additional drop in active management of 0.04 points, approximately 5% of the unconditional mean, after December 2018, relative to their non-ESG counterparts. Furthermore, when active management is measured relative to ESG-screened benchmarks, all mutual funds, regardless of ESG orientation, exhibited a notable reduction in divergence from ESG-screened market portfolios: 0.015 points (2%

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<sup>1</sup>Article 2.1(c) of Paris Agreement states “making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development” and Article 9.3 mentions “mobilizing climate finance”.

<sup>2</sup>The active management is measured with Active Share measure by Cremers and Petajisto (2009). The calculation of the Active Share measure is described in Section 3.3.

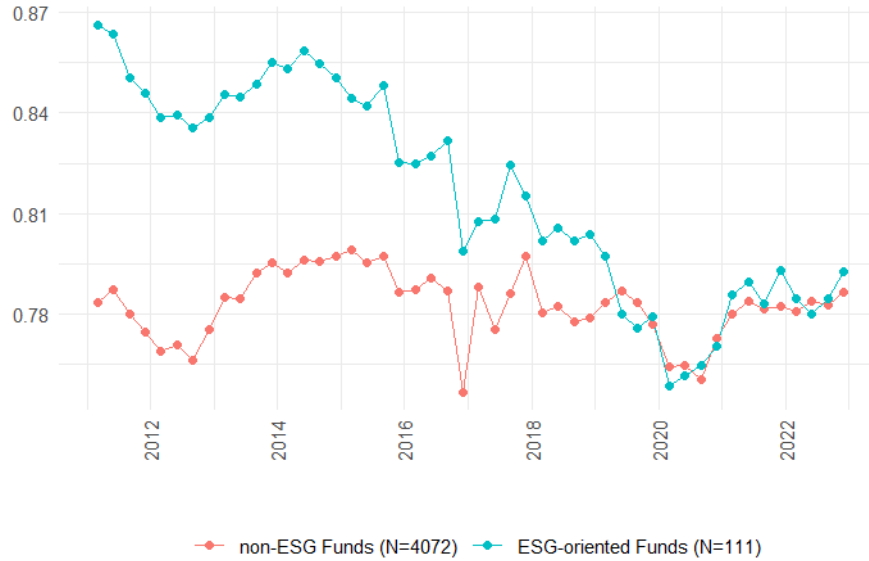


Figure 1: Active Share for non-ESG and ESG-oriented funds. The active share is calculated using 20 market cap. benchmarks. The red line depicts quarterly average active shares for active non-ESG funds ( $N=4,072$ ). The blue line depicts the quarterly average active shares for active ESG-oriented funds ( $N=111$ ). As the number of ESG-oriented funds is relatively small, one fund can largely impact the average active share of ESG-oriented funds. I test the robustness by re-calculating the averages of active shares, removing one fund at a time from the sample. The observed pattern remains consistent.

of the mean) after December 2015, and 0.034 points (4% of the mean) when the post-December 2018 period is considered.

Second, I propose a decomposition of the *Active Share* measure into fund-to-market and market-to-fund changes to investigate the direction of changes in active management. While I find that all mutual funds began to more closely follow both the S&P 500 and the ESG-screened FTSE4Good indexes after December 2015, there is no evidence that ESG-oriented funds exhibited a differential increase in alignment compared to non-ESG funds. However, examining the market indexes' alignment with mutual fund portfolios, I find that the S&P 500 became more similar to mutual fund holdings overall and exhibited a greater increase in alignment with the portfolios of ESG-oriented funds compared to those of non-ESG funds after December 2018. This suggests that the observed decline in active management among ESG-oriented funds may be partially explained by market indexes moving closer to the portfolio compositions of ESG-oriented funds.

Additionally, I investigate the impact of investor inflows on the observed changes in active management among ESG-oriented funds. The analysis reveals that ESG-oriented funds experienced higher inflows compared to non-ESG funds after December 2018. Furthermore, examining the relationship between active management and fund flows, I find that the typically positive association between active management and investor inflows reversed for ESG-oriented funds in the post-2018 period. This suggests that, in response to increased investor attention, ESG-oriented funds may

have shifted toward more passive, benchmark-aligned investment strategies.

The results indicate that while the Paris Agreement in 2015 increased attention to ESG criteria in investing, its effect was not immediate. This study finds the first signs of a shift toward more responsible or ESG-screened mainstream market benchmarks beginning after December 2015. The effect was reinforced in 2018, when major asset managers, such as BlackRock, further emphasized importance of ESG screening.<sup>3</sup> Correspondingly, a further decline in active management relative to ESG-screened portfolios was observed across all U.S. mutual funds after 2018, along with an additional reduction in the activeness of ESG-oriented funds relative to mainstream market portfolios.

Given the substantial growth in the number of mutual funds with explicit ESG criteria following the Paris Agreement, I account for the possibility that these newer funds, potentially less experienced in active management and stock selection, may drive the observed results. I remove these funds from the sample. The main conclusions hold on the restricted sample, suggesting that the decline in active management is driven by broader market forces affecting both newly launched and more experienced funds. In addition, I incorporate ESG-screened indexes that emerged in 2016 into the estimation of active management. The results further reinforce the observed decline in active management when these additional benchmarks are included. Nevertheless, the composition of traditional market-capitalization indexes remains notably distinct from that of ESG-screened benchmarks throughout the sample period.

The paper contributes to several strands of the finance literature. First, the paper contributes to the research on active management by examining trends in active portfolio management among ESG-oriented mutual funds. Second, this study adds to the literature on sustainable investing by analyzing how ESG preferences manifest within the US mutual fund industry. Third, this paper contributes to the growing body of work on ESG-oriented mutual funds by investigating the investment behaviors and distinguishing characteristics of these funds. This study is closely related to the works of Cremers et al. (2023) and Ceccarelli et al. (2023), who examine how actively managed ESG-oriented mutual funds approach stock selection. Building on this literature, the present paper investigates trends in the difference between ESG-oriented mutual fund holdings and market capitalization-weighted indexes. The findings of the paper suggest that preferences for sustainable investing, once primarily the domain of ESG-oriented mutual funds, have successfully entered the broader market as proxied by market indexes.

The remainder of the paper is organized as follows. Section 2 reviews previous studies and outlines the contribution of this paper to existing literature. Section 3 describes data and construction of the main variables. In Section 4, I analyze the trends in active management of ESG-oriented mutual funds and present regression results demonstrating the decline in their active management. Section 5 introduces a decomposition of the *Active Share* measure and tests potential mechanisms underlying the observed decrease. Section 6 conducts robustness checks and presents extensions to

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<sup>3</sup>BlackRock CEO Larry Fink's letter to CEOs: Andrew Ross Sorkin, *BlackRock's Message: Contribute to Society, or Risk Losing Our Support*, The New York Times, January 15, 2018 – [The New York Times Website](#).

the baseline results. Finally, Section 7 concludes.

## 2 Background

### 2.1 Prior Work on Active Management of Mutual Funds

This paper contributes to the literature on active management in mutual funds. Prior studies primarily examine factors influencing active management, such as fund size, age, flows (Gruber, 1996; Cremers and Petajisto, 2009; Pástor et al., 2015), as well as managers’ stock-picking abilities (Kacperczyk et al., 2005; Kacperczyk et al., 2008; Berk and Van Binsbergen, 2015; Kacperczyk et al., 2016). Findings generally indicate that active strategies rarely outperform passive investing (Gruber, 1996; Cremers et al., 2019).

Gruber (1996) highlights the rise of actively managed U.S. mutual funds, noting that stock selection can justify active management. Kacperczyk et al. (2005) show that managers’ stock-picking skills, especially when portfolios concentrate on specific industries, can enhance fund performance. Pástor et al. (2015) propose that managers develop selection skills through experience, though competition often limits performance gains. Management structure also matters: team-managed funds, for instance, tend to have superior security selection and returns from specialization (Dass et al., 2013). From a theoretical standpoint, Kacperczyk et al. (2016) argue that economic cycles influence managers’ information-processing and stock-picking abilities, resulting in “time-varying” skill.

Cremers and Petajisto (2009) influential work has attracted attention to measuring fund active-ness, which was previously commonly assessed by tracking error. However, they argue that tracking error alone overlooks key dimensions of active management and introduce *Active Share* as a measure that captures stock picking and selection strategies. Active share captures the difference between a fund’s portfolio weights and its benchmark and generally correlates with fund performance. Yet, the measure faces criticism, as funds might inflate active share to attract investors (Sensoy, 2009; H. Chen et al., 2025) or use “signal-jamming” to appear active (Brown and Davies, 2017: p.319). Further, Avramov et al. (2020) argue that active share is a noisy measure of managerial investment skill, as managers may deviate from the benchmark by overweighting overpriced stocks. Additionally, the relationship between active share and fund performance may depend on the benchmark used (Frazzini et al., 2016).

Despite criticisms, active share remains a common measure of stock selection and stock-picking skill (Petajisto, 2013; Berk and Van Binsbergen, 2015; Cremers et al., 2019; Pástor et al., 2020; Jiao et al., 2025). The present paper examines mutual fund active management through stock selection, focusing on ESG-oriented funds, where stock-picking skills are particularly relevant given the challenges of ESG stock selection amid greenwashing (Liang et al., 2021; Yang, 2022) and ambiguous ESG information (Christensen et al., 2018; Avramov et al., 2022; Berg et al., 2022).

While active management of ESG stocks is theoretically critical, this study finds a decline in ESG-oriented funds' activeness relative to market portfolio after December 2018.

## 2.2 Prior Work on Sustainable Investing

This paper also adds to research on sustainable investing preferences and strategies. The rise of responsible investing was investigated from both theoretical and empirical perspectives. Theoretical studies explore how preferences for responsible investing influence investor behavior and markets (Heinkel et al., 2001; Bénabou and Tirole, 2010; Albuquerque et al., 2019; Pástor et al., 2021), while empirical research tracks these preferences' effects on investment and corporate decisions (Hong and Kacperczyk, 2009; Gillan et al., 2021; Bolton and Kacperczyk, 2023).

Heinkel et al. (2001) model ethical investors' effects on firm valuations, concluding that avoiding unethical firms raises these firms' capital costs but requires a significant proportion of ethical investors. Bénabou and Tirole (2010) categorize motivations for social responsibility into altruism, material incentives, and esteem concerns, showing that support for social norms increases individual benefits from adhering to these norms. Starks (2023) distinguishes between "value" (financial return-driven) and "values" (socially motivated) reasons for sustainable investing. In their ESG model, Pástor et al. (2021) argue that investor preferences for green assets, especially during ESG shocks, drive the market toward greener portfolios (Pástor et al., 2021: p.551). Albuquerque et al. (2019), however, contend that consumer preferences shape corporate social responsibility (CSR) more than investors, viewing CSR as a tool for product differentiation and profit margin enhancement.

Hong and Kacperczyk (2009) provide empirical evidence on social norms' effects in investing, finding that socially responsible institutional investors drive down "sin stock" prices. Investor heterogeneity matters: responsible investors may accept losses from avoiding certain stocks, while less constrained investors, like mutual and hedge funds, can benefit if these stocks outperform. However, recent studies show that mutual fund flows now depend on their sustainability profiles (Hartzmark and Sussman, 2019; Ceccarelli et al., 2024; Gantchev et al., 2024). Giglio et al. (2023) find that 45% of retail investors see no reason to invest in ESG stocks, while those who do cite ethical and hedging motives. Bolton and Kacperczyk (2023) focus on carbon-transition risk, finding that investors demand higher returns for firms far from carbon compliance, suggesting that green policies are seen as irreversible (Bolton and Kacperczyk, 2023: p.3681).

Thus, research shows that investors can influence firms' cost of capital and CSR policies by ESG-based exclusions. ESG-driven investments, motivated by altruism, value, and policy-related transition risks, can shift the market equilibrium toward ESG preferences. Mutual funds are considered important market participants in making this shift. The present paper adds to the literature on sustainable investing by investigating ESG preferences in the mutual funds industry. By looking at the active choices made by mutual funds, the paper describes how ESG-oriented mutual funds' preferences for ESG securities move with market preferences.

## 2.3 Prior Work on ESG-oriented Mutual Funds

Finally, this paper aligns with growing research on sustainable mutual funds, which explores investor interest via fund inflows (Hartzmark and Sussman, 2019; Baker et al., 2022; Gantchev et al., 2024) and investment choices through funds’ portfolio composition (Raghunandan and Rajgopal, 2022; Orlov et al., 2022; Ceccarelli et al., 2023; Cremers et al., 2023).

Hartzmark and Sussman (2019) find that sustainability rankings positively impact fund inflows, with higher-ranked funds attracting more investments. Gantchev et al. (2024) argue that investors are now more cautious, weighing sustainability against financial returns when allocating funds. Baker et al. (2022), however, show that investors are willing to pay higher fees for ESG funds over comparable non-ESG options.

Sustainable mutual funds’ actual portfolios have received attention due to potential greenwashing incentives (Gibson Brandon et al., 2022). Raghunandan and Rajgopal (2022) examine ESG funds’ true commitment to responsible investing, finding that while ESG funds hold stocks with higher ESG-scores, they often invest in companies with poor labor and environmental compliance, highlighting challenges in evaluating ESG profiles. Ceccarelli et al. (2023) assess mutual fund managers’ ESG skills, distinguishing proactive managers, who select firms that later gain sustainable recognition, from reactive managers. Cremers et al. (2023) add to this by measuring ESG stock selection skills, differentiating between “directional” (following ESG ratings) and “active” (deviating from top-rated ESG stocks and benchmarks) strategies. They find that active ESG strategies correlate with better fund performance, especially for managers specializing in ESG, emphasizing the complexity of effective ESG investing.

The research is related to (Cremers et al., 2023) but with a different focus. First, it examines the overall decline in conventional and ESG-oriented funds’ active management post, unlike Cremers et al., who focus on comparing directional and active ESG funds. Rather than focusing on ESG stock selection skills, the paper examines time trends in the active management of ESG-oriented funds by analyzing their deviation from, or alignment with, the market portfolio to study shifts in market preferences for ESG securities.

## 3 Data

### 3.1 Mutual Funds Data

The data on mutual funds comes from the CRSP Survivor-Bias-Free US Mutual Funds Database. The sample spans from March 2011 to December 2022 with quarterly observations. Although CRSP provides holdings data for most funds starting in 2010, after applying data cleaning procedures, 2011 is the first year for which holdings are consistently available in the sample. First, I filter out non-equity funds, by keeping only funds that have more than 75% of assets invested in common equity. Next, I drop all funds, which CRSP identifies as an index fund or ETF. For each fund, I

collapse fund information across share classes. Total net assets are calculated as a sum of share classes data. Other fund-level characteristics such as management fee, expense ratio, and turnover ratio are asset-weighted averages of share-level characteristics. Following a common approach in the literature (Chevalier and Ellison, 1997; Cremers et al., 2023; Gantchev et al., 2024), I remove small funds with less than \$20 million in TNA to mitigate incubation bias (Evans, 2010). I require funds to have information on holdings, quarterly returns and fund flows. Further, I remove funds with less than 10 holdings and funds with more than 20% of assets invested in one holding to ensure that the fund’s portfolio is well diversified.

I identify ESG-oriented funds based on keywords.<sup>4</sup> If a fund’s name contains a keyword, I consider this fund as a ESG-oriented fund. I find 172 ESG-oriented mutual funds. Further, I review the sample for name changes. In the sample of 172 identified ESG-oriented funds, 61 funds have changed their names to include a sustainable keyword. I remove these funds from the sample to mitigate potential greenwashing concerns associated with them (Cochardt et al., 2023). Afterwards, I verify the identification by reading funds’ investment objectives and strategies disclosed in funds’ prospectuses. The final sample of ESG-oriented mutual funds consists of 111 funds. The number of sustainable funds is very close to that of (Gantchev et al., 2024), who uses the Morningstar US mutual funds data. The number of ESG-oriented funds by year is presented in Table 11 in the appendix.

In addition to the 111 ESG-oriented funds, I include 4,072 non-ESG-oriented funds that existed during the same period and share the same Lipper investment objective codes.<sup>5</sup> This yields a final sample of 4,183 actively managed, equity-oriented, U.S.-domiciled mutual funds, resulting in 106,380 fund-quarter observations.

### 3.2 Benchmarks Data

Data on index holdings are obtained using CRSP-reported holdings of index funds and index-tracking ETFs. I use the 20 most common market capitalization indexes similar to those in Cremers and Petajisto (2009) and Cremers et al. (2023) to calculate the level of active management for each fund. These indexes include: Russell 1000 Growth, Russell 1000 Value, Russell 1000, Russell 2000 Growth, Russell 2000 Value, Russell 2000, Russell 3000 Growth, Russell 3000 Value, Russell 3000, Russell MidCap Growth, Russell MidCap Value, S&P 500 Growth, S&P 500 Value, S&P 500, S&P

<sup>4</sup>I use the following keywords for identification of sustainable funds: sustain, responsi, pax, parnassus, SRI, ESG, screen, ethical, conscious, CSR, thematic, epiphany, better world, environm, green, climate, clean, carbon, solar, earth, renewable, water, alternative energy, wind energy, fossil, low carbon, ecolog, eco, social, impact, fair, gender, catholic, aquina, women, equality, amana, just, community, diversity. The list of keywords is a union set of keywords used in (Van der Beck, 2021; Cremers et al., 2023; Gantchev et al., 2024).

<sup>5</sup>The following Lipper investment objectives are retained in the sample: GI – Growth and Income Funds, G – Growth Funds, MC – Mid-Cap Funds, EM – Emerging Markets Funds, GL – Global Funds, SG – Small-Cap Funds, IF – International Funds, GNR – Global Natural Resources Funds, FX – Flexible Portfolio Funds, S – Specialty/Miscellaneous Funds, EI – Equity Income Funds, GIF – Global Infrastructure Funds, B – Balanced Funds, IS – International Small-Cap Funds, GRE – Global Real Estate Funds, GS – Global Small-Cap Funds, ID – Industrials Funds, AED – Alternative Event-Driven Funds, AGM – Alternative Global Macro Funds.

MidCap 400 Growth, S&P MidCap 400 Value, S&P MidCap 400, S&P SmallCap 600 Growth, S&P SmallCap 600 Value, and S&P SmallCap 600. These benchmarks represent the most widely used equity indexes and include companies with the largest market capitalizations. As such, they serve as appropriate benchmarks to evaluate a fund’s active deviation from mainstream market securities. The active share calculated using these 20 benchmarks is referred to as *Active Share*.

In addition, I calculate the active share relative to indexes with explicit ESG criteria to capture passive responsible investing strategies. The ESG benchmarks include the FTSE4Good US Select Index, MSCI USA ESG Select Index, MSCI Global Environment Select Index, MSCI KLD 400 Social Index, MSCI KLD 400 Social ex Fossil Fuels Index, Nasdaq Clean Edge Green Energy Index, and S&P Global Clean Energy Index. The active share calculated using this set of 7 ESG-screened benchmarks is referred to as *Active Share ESG*. Similar to mutual fund holdings, benchmark holdings of these 7 indexes are available quarterly from March 2011 to December 2022.

### 3.3 Active Share

To measure the active management of mutual funds, I calculate the active share measure introduced in (Cremers and Petajisto, 2009). The active share is defined as:

$$ActiveShare_{f,t} = \frac{1}{2} \sum_{i=1}^N |w_{f,j,t} - w_{b,j,t}|, \quad (1)$$

where  $w_{fjt}$  corresponds to the fund  $f$  weight on security  $i$  in quarter  $t$ , and  $w_{bjt}$  corresponds to the benchmark’s weight on the same security at the same quarter. The sum is calculated over the set of all stocks  $N$  in the fund’s or the benchmark’s portfolio. The values of the active share range from 0 to 1, with 0 meaning complete overlap in portfolio holdings and no activeness and 1 meaning no overlap in holdings and high fund’s activeness. Funds with an *Active Share* above 60% are generally classified as actively managed, whereas those with an *Active Share* below 20% are considered closet indexers (Cremers and Petajisto, 2009).

The active share (active share ESG) is calculated for each fund against each of the 20 (7) benchmarks for each quarter. To choose a benchmark for a fund in a quarter, among active shares for each benchmark, I look at the active share, which gives the highest overlap (lowest active share). The active share with the lowest value is considered a fund’s active share for the quarter, and the benchmark corresponding to the lowest active share indicates a fund’s empirical benchmark.

Table 1 provides summary statistics for the main variables. The average non-ESG fund in the sample has \$1759 million in total net assets, an expense ratio of 0.007%, portfolio turnover ratio of 0.418 in %TNA, experiences quarterly outflows of -0.002% of its TNA and excess returns of 0.006, holds 107 portfolio positions and has the age of 16 years. The average sustainable fund has \$873.9 million in total net assets, an expense ratio of 0.008%, portfolio turnover ratio of 0.357, experiences quarterly inflows of 0.007% of its TNA and excess returns of 0.005, holds 85 portfolio positions and

has the age of 13 years. The average active share of non-ESG funds is 0.783. For ESG-oriented funds, the average active share is 0.811. The average activeness is somewhat higher than the one observed in Cremers et al. (2023). However, the sample of this study differs in the time span, data cleaning process, and the resulting number of funds.<sup>6</sup>

Table 1: Summary Statistics

	Obs.	Mean	Std dev	Median	Min	Max
non-ESG Funds						
TNA (in m.\$)	103,976	1759	4310	415.4	22.6	31242
Age	103,976	16.84	12.07	15	0	98
Flows (in % TNA)	103,976	-0.002	0.041	-0.006	-0.123	0.247
Management Fee	103,976	0.504	0.371	0.606	-0.021	1.26
Expense Ratio	103,976	0.007	0.005	0.009	0	0.018
Number of Holdings	103,976	107.5	160.8	64	11	1948
Buy-and-hold returns	103,976	0.025	0.09	0.035	-0.255	0.255
4F Alphas	82,090	-0.004	0.003	-0.004	-0.012	0.003
Return volatility	103,976	0.011	0.006	0.009	0.004	0.036
Turnover Ratio	103,976	0.418	0.452	0.31	0	2.26
Active Share	103,976	0.783	0.157	0.808	0.001	1
Active Share ESG	103,976	0.858	0.133	0.897	0.168	1
Activeness (P2020)	103,972	40.07	64.6	20.31	0.0	869.3
ESG-oriented Funds						
TNA (in m.\$)	2,404	873.9	2445	196.7	22.6	31242
Age	2,404	13.84	9.9	12	0	40
Flows (in % TNA)	2,404	0.007	0.042	-0.002	-0.123	0.246
Management Fee	2,404	0.507	0.346	0.622	-0.021	1.26
Expense Ratio	2,404	0.008	0.005	0.009	0	0.018
Number of Holdings	2,404	85.89	127.5	43	11	825
Buy-and-hold returns	2,404	0.024	0.089	0.035	-0.255	0.255
4F Alphas	1,746	-0.004	0.003	-0.004	-0.012	0.003
Return volatility	2,404	0.011	0.006	0.009	0.004	0.036
Turnover Ratio	2,404	0.357	0.352	0.29	0	2.26
Active Share	2,404	0.811	0.167	0.85	0.038	1
Active Share ESG	2,404	0.802	0.165	0.839	0.185	1
Activeness (P2020)	2,404	40.19	54.03	22.82	0.0	625.5

This table reports summary statistics of quarterly mutual funds characteristics from March 2011 to December 2022. The sample includes active US equity mutual funds with at least 20\$ million in total assets and more than 10 holdings. Statistics are given separately for non-ESG funds ( $N = 4,072$ ) and funds identified as ESG-oriented ( $N = 111$ ). All variables are defined in the Appendix. The variables *management fee*, *expense ratio*, *turnover ratio*, *TNA*, *fund flows*, *buy-and-hold returns*, *Fama-French-Carhart four-factor alpha (4F Alpha)* and *return volatility* are winsorized at the 1st and 99th percentiles.

## 4 Trends in Active Management of Mutual Funds

### 4.1 Overview of Funds' Empirical Benchmarks

I begin the analysis of funds' active management with an overview of funds' empirical benchmarks and their changes. For each quarter, the fund's empirical benchmark is an index, which

<sup>6</sup>In Cremers et al. (2023), the average active share is 0.76 for 1,907 funds and time period from December 2003 to March 2021.

resulted in the lowest active share for the fund.

On average, in any given quarter, the assigned empirical benchmark changes for 20% of non-ESG funds and 25% of ESG-oriented funds, indicating that most benchmarks remain stable over time. Figure 2 shows the proportion of funds with the 10 most frequently assigned benchmarks over the sample period. Notably, while it is not immediately clear which benchmark dominates for non-ESG funds, for ESG-oriented funds, the S&P 500 Growth takes the largest proportion over the sample period. This finding aligns with prior evidence suggesting that ESG-oriented funds tend to favor growth stocks in their portfolios (Baily and Gnabo, 2022).

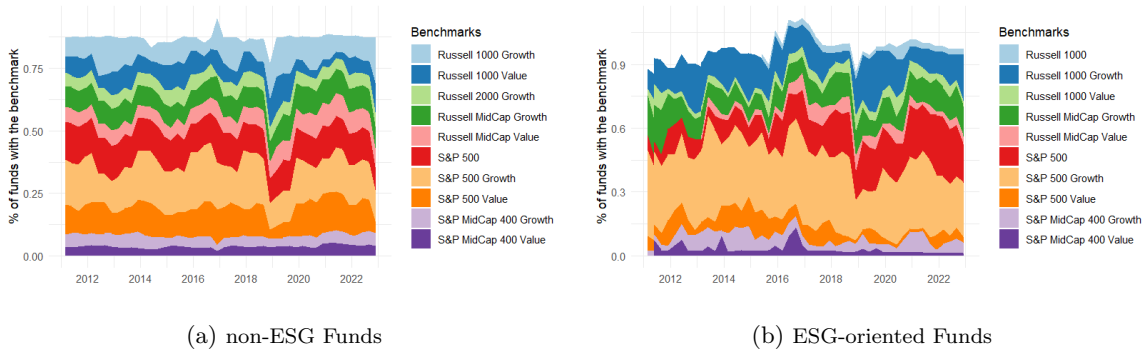


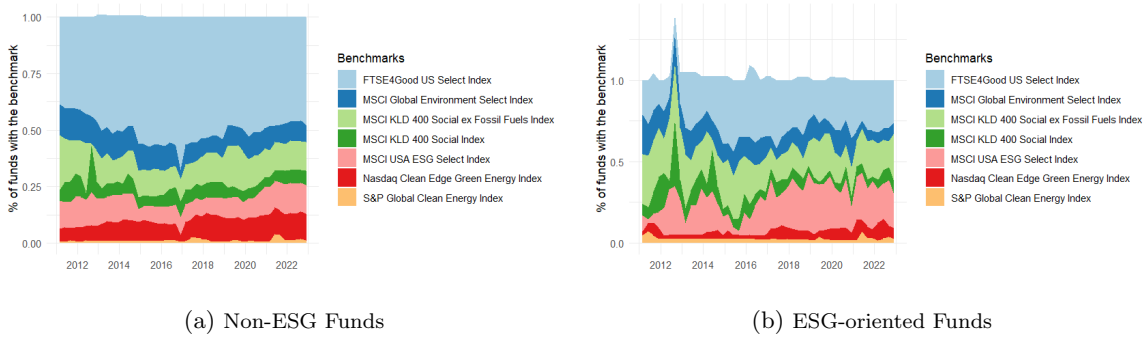
Figure 2: The figure shows the proportion of funds associated with the 10 most frequently assigned empirical benchmarks over the sample period. Fig. (a) presents the proportions for non-ESG funds, while fig. (b) shows those for ESG-oriented funds. The proportion is calculated as the number of funds using a given benchmark in a particular quarter divided by the total number of funds in that quarter with an *Active Share* not equal to 1. The benchmarks are from the set of 20 market capitalization indexes.

Figure 3 displays the most frequently assigned benchmarks for the set of 7 ESG-screened indexes. The FTSE4Good US Select Index appears to be the most commonly assigned benchmark for both ESG and non-ESG funds. Interestingly, the proportion of ESG-oriented funds with the MSCI USA ESG Select Index as an assigned benchmark increased notably after 2016.

## 4.2 Decrease in Active Management of ESG-oriented Funds

### 4.2.1 Graphical Evidence

Figure 1 in the introduction illustrated the decrease in active management, as measured by *Active Share*. One might raise a concern that this decrease is specific to the measure used. To address this, I explore the observed trend using alternative measures of active management. Specifically, I examine *Active Share ESG*, a version of *Active Share* that replaces purely market capitalization based indexes with ESG-screened market indexes; fund deviation from the constant benchmark, the S&P 500 index; the portfolio turnover ratio, which measures active management through the frequency of trades; and the activeness measure proposed by Pástor et al. (2020), which combines deviations from the market and trade frequency to assess fund active management.



**Figure 3:** The figure shows the proportion of funds associated with the most frequently assigned empirical benchmarks over the sample period. Fig. (a) presents the proportions for non-ESG funds, while fig. (b) shows those for ESG-oriented funds. The proportion is calculated as the number of funds using a given benchmark in a particular quarter divided by the total number of funds in that quarter with an *Active Share ESG* not equal to 1. The benchmarks are from the set of 7 ESG-screened indexes.

The results are presented in Figure 4. A similar downward trend is evident across several measures: *Active Share ESG* in fig. (a), the deviation from the S&P 500 in fig. (b), and activeness as measured by Pástor et al. (2020) in fig. (d). However, the portfolio turnover ratio in fig. (c) does not exhibit the same decline for ESG-oriented funds. These funds generally demonstrate lower trade frequencies on average.

Interestingly, the decline is observed in measures of active management that assess deviations from the market portfolio, but not in those that focus on trading frequency. This suggests that the decrease in active management is more closely tied to reduced deviations from the market, indicating that ESG-oriented fund portfolios are becoming more aligned with market benchmarks or are less actively managed. The graphical evidence from these alternative measures of active management thus supports the trend of declining active management, particularly when such management is assessed through market deviations or stock-picking ability. This signals a recent reduction in stock-picking activities among managers of ESG-oriented funds. In the following section, I provide regression analysis to further confirm the observed decline.

#### 4.2.2 Regression Evidence

In this section, I extend the analysis by estimating panel difference-in-differences regressions to assess the differential decline in active management among ESG-oriented mutual funds. While the increased attention to ESG criteria in investing represents an industry-wide shock, it is reasonable to expect that the effect would be stronger for explicitly ESG-oriented funds. Accordingly, I consider ESG-oriented funds as the differential treatment group. It is difficult to pinpoint the exact moment when the decline in active management became most pronounced. Figure 1 in the introduction suggests that the activeness of ESG-oriented funds converged with that of non-ESG funds after 2018. However, alternative measures presented in Figure 4 indicate a notable decline beginning

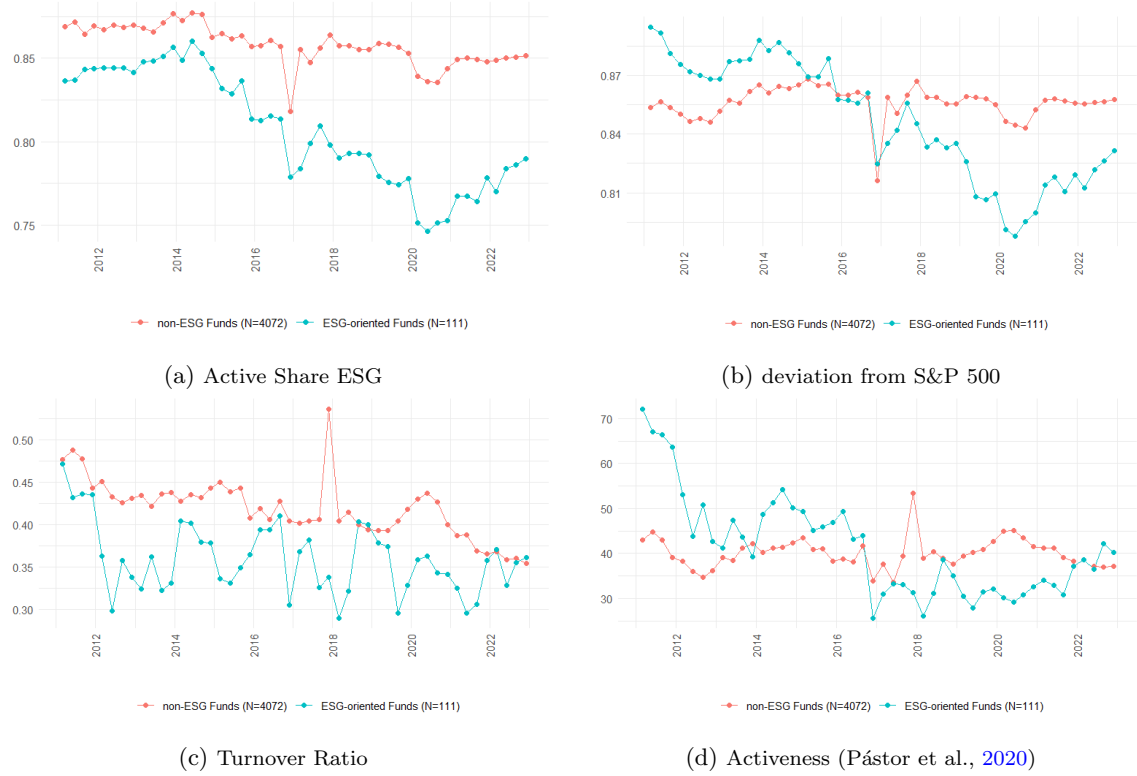


Figure 4: The figure displays the distribution of alternative measures of fund active management over the sample period for non-ESG and ESG-oriented funds. (a) shows the distribution of average *Active Share ESG*. (b) shows the average deviation of fund holdings from the S&P 500. (c) shows the distribution of average portfolio turnover. (d) shows the average activeness as measured by Pástor et al., 2020.

shortly after the end of 2015. To account for this ambiguity, I test both post-2015 and post-2018 periods in the empirical analysis of the observed decline. I further validate the robustness of the selected treatment years by testing the trends assumption in Section 6.1. The analysis is based on the following empirical specification:

$$\begin{aligned}
 ActiveManagement_{f,j,t} = & \beta_1 \times ESGFund_{f,t} \times Post2015(18)_{f,t} + \beta_2 \times ESGFund_{f,t} \\
 & + \beta_3 \times Post2015(18)_{f,t} + \beta_4 \times X_{f,t-1} + \gamma_j + \theta_y + \varepsilon_{f,t},
 \end{aligned} \tag{2}$$

where  $f$  denotes the CRSP mutual fund portfolio with Lipper investment objective  $j$  in quarter  $t$ . The dependent variable,  $ActiveManagement_{f,j,t}$ , represents one of the following measures of active management: *Active Share*, *Active Share ESG*, the activeness metric proposed by Pástor et al. (2020), or the portfolio turnover ratio. The interaction term,  $ESGFund_{f,t} \times Post2015(18)_{f,t}$ , captures the interaction effect of two indicator variables:  $ESGFund_{f,t}$ , which equals one if the fund is classified as ESG-oriented, and  $Post2015(18)_{f,t}$ , which equals one for quarters after December 2015 (December 2018). The coefficient of interest,  $\beta_1$ , estimates the change in activeness for ESG-

oriented funds in the post-2015 (post-2018) period. A negative and statistically significant  $\beta_1$  would indicate a decline in active share among ESG-oriented funds in the defined period. The model includes a vector of lagged control variables,  $X_{f,t-1}$ . The control variables are the natural logarithm of fund total net assets (TNA), the logarithm of fund age, fund flows, four factor alpha, expense ratio and return volatility. All control variables are winsorized at the 1% and 99% levels to reduce the effect of outliers. Correlations between the main variables used in the analysis are presented in Table 10 in the appendix. To ensure comparisons are made within similar fund categories, I include investment objective fixed effects, denoted by  $\gamma_j$ . This controls for time-invariant differences across funds by accounting for Lipper investment styles, thereby restricting comparisons to groups of funds with similar investment objectives. Additionally, to control for time-specific common trends affecting all funds, I include a set of year dummy variables, denoted by  $\theta_y$ .

Table 2 presents the regression results. Columns (2) and (4) show that, on average, ESG-labelled funds exhibited higher levels of active management prior to December 2015 (and December 2018), compared to non-ESG funds with similar investment objectives. This relationship does not appear in the models without interaction terms, columns (1) and (3), suggesting that ESG-oriented funds did not consistently display higher active management across the whole sample period. However, this difference is evident only when active management is measured using deviations from the 20 most commonly used market capitalization benchmarks (*Active Share*). In contrast, columns (5) and (7) indicate that ESG-oriented funds exhibit lower levels of active management relative to ESG-screened indexes (*Active Share ESG*) than non-ESG funds over the entire sample period. Furthermore, when portfolio turnover is used as a proxy for activeness, columns (13)–(16), ESG funds, on average, display lower trading frequency than their non-ESG counterparts.

Examining the period following December 2015, the Post2015 dummy is statistically significant, indicating a general decline in active management across all funds both relative to traditional market capitalization indexes, columns (1)–(2), and, to an even greater extent, relative to ESG-screened indexes, columns (5)–(6). The dummy variable for the post-December 2018 period is also significant, suggesting a more pronounced decline in active management after December 2018. This decrease is especially notable when using the *Active Share ESG* measure, compared to the traditional *Active Share*. Specifically, the reduction in active management relative to ESG-screened benchmarks after December 2018 across all funds is approximately 0.034 points, or about 4% of the unconditional mean of *Active Share ESG*.

Table 2: Decrease in Active Management of ESG-oriented Funds

	Active Share				Active Share ESG				Activeness P2020				Turnover			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
ESG Fund*Post2015		-0.019 (-1.088)				-0.028 (-1.536)				-5.519 (-1.041)				0.058* (1.703)		
Post2015	-0.005** (-2.284)	-0.005** (-2.073)			-0.015*** (-9.536)	-0.015*** (-9.011)			0.856 (0.854)	0.968 (0.961)			0.013* (1.798)	0.012 (1.63)		
ESG Fund*Post2018				-0.043** (-1.985)				-0.045** (-2.125)				-5.748 (-1.146)				0.052 (1.35)
Post2018			-0.018*** (-5.017)	-0.017*** (-4.702)			-0.034*** (-11.216)	-0.033*** (-10.841)			0.444 (0.274)	0.58 (0.356)			-0.025** (-2.292)	-0.026** (-2.398)
ESG Fund	0.022 (1.298)	0.036** (2.021)	0.022 (1.298)	0.042** (2.429)	-0.038** (-2.249)	-0.018 (-1.048)	-0.038** (-2.249)	-0.017 (-0.957)	-8.249* (-1.824)	-4.195 (-0.612)	-8.249* (-1.824)	-5.481 (-0.966)	-0.102*** (-3.329)	-0.144*** (-3.594)	-0.102*** (-3.329)	-0.127*** (-3.388)
logTNA <sub>t-1</sub>	-0.013*** (-9.83)	-0.013*** (-9.818)	-0.013*** (-9.83)	-0.013*** (-9.809)	-0.01*** (-8.681)	-0.01*** (-8.666)	-0.01*** (-8.681)	-0.01*** (-8.658)	-1.649*** (-3.974)	-1.646*** (-3.965)	-1.649*** (-3.974)	-1.646*** (-3.965)	0.002 (0.68)	0.002 (0.67)	0.002 (0.68)	0.002 (0.671)
logAge <sub>t-1</sub>	0.002 (0.535)	0.002 (0.524)	0.002 (0.535)	0.002 (0.487)	-0.002 (-0.725)	-0.002 (-0.746)	-0.002 (-0.725)	-0.003 (-0.788)	-8.581*** (-6.661)	-8.594*** (-6.666)	-8.581*** (-6.661)	-8.606*** (-6.667)	-0.064*** (-6.099)	-0.064*** (-6.083)	-0.064*** (-6.099)	-0.064*** (-6.072)
Flows <sub>t-1</sub>	0.011 (0.646)	0.012 (0.653)	0.011 (0.646)	0.012 (0.687)	0.030** (2.09)	0.030** (2.104)	0.030** (2.09)	0.031** (2.147)	17.78** (2.204)	17.810** (2.208)	17.78** (2.204)	17.87** (2.215)	0.07 (1.223)	0.069 (1.217)	0.07 (1.223)	0.068 (1.209)
4F Alpha <sub>t-1</sub>	-0.761 (-1.488)	-0.752 (-1.469)	-0.761 (-1.488)	-0.733 (-1.43)	-1.78*** (-4.397)	-1.767*** (-4.357)	-1.78*** (-4.397)	-1.750*** (-4.31)	-654.5*** (-2.859)	-652.03** (-2.846)	-654.5*** (-2.859)	-650.7*** (-2.841)	-9.353*** (-5.747)	-9.38*** (-5.762)	-9.353*** (-5.747)	-9.388*** (-5.767)
Return Volatility <sub>t-1</sub>	0.479*** (2.933)	0.478*** (2.931)	0.479*** (2.933)	0.479*** (2.937)	0.943*** (6.982)	0.942*** (6.978)	0.943*** (6.982)	0.943*** (6.989)	290.53*** (5.335)	290.4*** (5.333)	290.5*** (5.335)	290.6*** (5.338)	2.398*** (5.561)	2.399 (5.564)	2.398*** (5.561)	2.397*** (5.559)
Expense Ratio <sub>t-1</sub>	6.135*** (13.881)	6.132*** (13.87)	6.135*** (13.881)	6.128*** (13.863)	3.586*** (10.392)	3.581*** (10.376)	3.586*** (10.392)	3.578*** (10.369)	4659.4*** (33.128)	4658.6*** (33.125)	4659.4*** (33.128)	4658.5*** (33.125)	44.53*** (43.831)	44.53*** (43.834)	44.53*** (43.831)	44.53*** (43.839)
Adj. R <sup>2</sup>	0.393	0.393	0.393	0.393	0.493	0.493	0.493	0.493	0.36	0.36	0.36	0.36	0.302	0.302	0.302	0.302
FE	Obj, Year	Obj, Year	Obj, Year	Obj, Year	Obj, Year	Obj, Year	Obj, Year	Obj, Year	Obj, Year	Obj, Year	Obj, Year	Obj, Year	Obj, Year	Obj, Year	Obj, Year	Obj, Year
Obs.	80,179	80,179	80,179	80,179	80,179	80,179	80,179	80,179	80,175	80,175	80,175	80,175	80,179	80,179	80,179	80,179

This table reports the estimated decrease in active management among ESG-oriented mutual funds after December 2015 (December 2018). Columns (1)-(4) use *Active Share* calculated following the methodology of Cremers and Petajisto (2009) as the dependent variable. Columns (5)-(8) use *Active Share ESG*, which incorporates ESG-screened benchmarks into calculation of *Active Share*. Columns (9)-(12) employ the activeness measure developed by Pástor et al. (2020) as the dependent variable. In columns (13)-(16), the dependent variable is portfolio turnover ratio. Standard errors are clustered at the fund level. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels, respectively. *t*-statistics are reported in parentheses.

Turning to the differential change in active management for ESG-oriented funds after the dates under examination, the following trends emerge. Column (4) shows that ESG-oriented funds experienced an additional decrease in active management of 0.043 points after December 2018, relative to non-ESG funds with similar investment objectives, when active management is measured by deviation from the 20 market capitalization indexes. The effect is not significant for the post-2015 period, as the interaction term in column (2) is not statistically distinguishable from zero. Similar results are observed when using the *Active Share ESG* measure. The activeness measure proposed by Pástor et al. (2020) shows no significant change for either the post-2015 or post-2018 periods across all funds, and no differential change for ESG-oriented funds. The differential change in active management for ESG-oriented funds is positive but only marginally significant in the post-2015 period, column (14), and not statistically significant in the post-2018 period, column (16), when using the turnover ratio as a proxy for activeness. Interestingly, all funds, regardless of ESG orientation, show a reduction in trading frequency after December 2018, columns (15) and (16).

This section concludes that while all mutual funds have become less actively managed over time, ESG-oriented funds experienced an additional decline in active management after December 2018, particularly in terms of their deviation from market indexes. Although ESG funds exhibited significantly higher levels of active management prior to that date, their activeness has since converged with that of non-ESG funds. Notably, this decline is evident only in measures based on portfolio deviations from market benchmarks, not in those based on trading frequency. Interestingly, when active management is measured by deviation from ESG-screened market indexes, all mutual funds, regardless of ESG orientation, show a significant increase in similarity with these benchmarks in both the post-December 2015 and post-December 2018 periods. This trend points to a broader industry-wide shift toward alignment with ESG-screened portfolios. In combination with the differential effect observed for ESG-oriented funds after December 2018, the findings suggest the presence of both market-wide factors driving a general decline in active management, and ESG-specific factors contributing to a more pronounced decrease in active management among ESG-oriented funds after this period. The significance of different time periods, alongside the variation in findings across multiple measures of active management, indicates that the observed decline in activeness both among ESG-oriented funds and within the mutual fund industry more broadly may be driven by a range of underlying factors, potentially unfolding at different points in time. The following section investigates these mechanisms in greater detail, with the aim of addressing a central question: which underlying factors might explain the observed trends in active management?

## 5 What Can Explain the Decrease?

This section explores the potential channels that may have contributed to the decline in active management among US mutual funds. The previous section concludes that there was a general decline in active management among both conventional and ESG-oriented funds, which was more

pronounced when active management is measured by deviation from an ESG-screened market portfolio. This general decline was more substantial in the period following December 2018. However, the first signs of this decrease appeared as early as after the end of 2015, with the estimated decline being smaller but still statistically significant. This pattern suggests the presence of a market-wide factor that influenced mutual fund investment strategies, encouraging a shift toward more responsible investment practices. The Paris Agreement, which was adopted at the end of 2015 and attracted significant attention to the financing of a sustainable transition, may account for the enlarged focus on ESG criteria in investing. This shift likely impacted the investment behavior of mutual funds broadly, contributing to greater alignment with more responsible portfolios across the whole industry. Therefore, the first part of this section, Section 5.1, addresses the the increased market sustainability and its influence on active portfolio management among mutual funds.

Another observed trend: the differential decrease in active management for ESG-oriented funds when measured by deviation from market indexes, which becomes pronounced in the period following 2018. This finding suggests that an ESG-specific factor may have influenced the deviation of ESG-oriented funds from the mainstream market portfolio. The year 2018 marked several significant developments in the asset management industry. Notably, in January 2018, Larry Fink, CEO of BlackRock, the largest asset management firm and a major manager of U.S. mutual funds publicly stated that his company would begin to take social responsibility into account when making investment decisions.<sup>7</sup> This announcement underscored the rising importance of ESG criteria within the mutual funds industry. The reassured importance of ESG criteria in investing coincided with substantial investor inflows into ESG funds in 2018.<sup>8</sup> The second part of this section, Section 5.2, examines the flows into ESG-oriented funds and how the increase in the investors inflows may have contributed to the decreased level of active management among ESG-oriented funds relative to market indexes.

## 5.1 Sustainability of the Market

Since the Paris Agreement, financial markets have increasingly started to be oriented toward sustainability. For the mutual fund industry as a whole, this signifies a closer alignment with responsible investing strategies, possibly reflected in the growing convergence with ESG-screened indexes. Edmans (2023) argues that, in principle, there should be no distinction between ESG investing and conventional investing. In his view, a focus on ESG considerations aligns naturally with the assessment of company-specific risks, which are eventually incorporated into market prices. The shift toward sustainable investing, reinforced by the Paris Agreement, may help explain why mutual funds portfolios have become increasingly aligned with ESG-screened market indexes, and why conventional mutual funds have reduced their divergence from sustainable market portfolio. To

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<sup>7</sup>Andrew Ross Sorkin, *BlackRock's Message: Contribute to Society, or Risk Losing Our Support*, The New York Times, January 15, 2018 - [The New York Times Website](#).

<sup>8</sup>Jon Hale, *5 Things to Know About Sustainable Funds*, Morningstar, February 14, 2019 – [Morningstar Website](#).

investigate whether the growing emphasis on sustainability can account for the observed decline in active management, this section compares changes in fund portfolios relative to the market portfolio and, conversely, changes in the market portfolio relative to fund portfolios. These changes are then compared between ESG-oriented and non-ESG funds.

The *Active Share* measure, which quantifies the extent to which a fund’s portfolio deviates from the market portfolio, captures the overall level of difference between the two portfolios but does not reveal the source of the deviation. In other words, a change in *Active Share* could result either from the fund increasingly replicating a market index, or from the market portfolio itself shifting closer to the fund’s composition. However, the direction of this convergence or divergence is not distinguishable from a simple increase or decrease in *Active Share*. To uncover the directionality behind the observed change in active management, specifically, whether the decline is driven by ESG-oriented funds aligning more closely with market indexes, or by the market becoming more similar to the portfolios of ESG-oriented funds, I employ a decomposition of the *Active Share* measure into fund and market changes and run a panel regression to estimate the relative contributions of both adjustments.

Equation 1 estimates the difference between portfolios by comparing the compositions of the fund and market portfolios at time  $t$ , capturing the degree of divergence at a given point in time. However, to evaluate the direction of change in *Active Share*, I hold either the market or fund portfolio constant at time  $t$  and compare it to the corresponding fund (index) portfolio from period  $t - 4$ . This approach allows me to determine whether the difference between the fund’s holdings from a year ago and the current market portfolio is greater than the difference between the fund’s current holdings and the current market. In doing so, it reveals whether the fund has moved closer to the market portfolio over the past year. Conversely, by holding the fund’s composition constant at time  $t$  and comparing it to the market portfolio from  $t - 4$ , I assess whether the market has become more aligned with the fund’s current holdings. The decomposition for the fund’s trend is defined as follows:

$$FundChange_{f,t} = \frac{1}{2} \sum_{i=1}^N |w_{f,i,t-4} - w_{b,i,t}| - \frac{1}{2} \sum_{i=1}^N |w_{f,i,t} - w_{b,i,t}|, \quad (3)$$

where  $w_{f,i,t-4}$  denotes the weight of fund  $f$  in security  $i$  as held in the fund’s portfolio at time  $t - 4$ ,  $w_{f,i,t}$  represents the weight of fund  $f$  for the same security  $i$  at time  $t$ , and  $w_{b,i,t}$  denotes the weight of security  $i$  in the benchmark  $b$  at time  $t$ . The first term, similar to the *Active Share* measure, captures the difference between the fund’s portfolio composition a year ago and the current composition of the market. The subtraction term reflects the difference between the fund’s current portfolio and the current market portfolio. A value of  $FundChange_{f,t} > 0$  implies that the fund’s holdings have moved closer to the current market composition over the past year, i.e., the fund has become more aligned with the market. Conversely, a negative value of  $FundChange_{f,t}$  indicates

that the fund’s holdings were more closely aligned with the current market composition one year ago than they are at present. This suggests that the fund has diverged from the market over time, rather than adjusting its portfolio in line with changes in the benchmark.

The decomposition can be illustrated with a simple example. Suppose that one year ago, a fund allocated 60% of its TNA to security  $i_1$  and 40% to security  $i_2$ . In the current period, the fund holds 30% in  $i_1$  and 70% in  $i_3$ . Meanwhile, the current market portfolio consists of 50% in  $i_1$  and 50% in  $i_2$ . To assess how the fund has moved relative to the market, we can compare the fund’s past and present portfolios to the current market composition. The difference between the fund’s portfolio a year ago and the current market is  $0.5*(|0.6-0.5|+|0.4-0.5|) = 0.5*(0.1+0.1) = 0.1$ . The difference between the fund’s current portfolio and the current market is  $0.5*(|0.3-0.5|+|0-0.5|+|0.7-0|) = 0.5*(0.2+0.5+0.7) = 0.7$ . The resulting fund change is therefore  $0.1 - 0.7 = -0.6$ , indicating that the fund’s current holdings have moved further away from the market portfolio compared to a fund portfolio composition a year ago. This suggests that the fund is not following the market’s direction. It reduced its weight in  $i_1$ , removed  $i_2$  entirely, and introduced  $i_3$ , a security not included in the current market portfolio.

Similarly, the directional movement of the market can be assessed as follows:

$$MarketChange_{b,t} = \frac{1}{2} \sum_{i=1}^N |w_{b,i,t-4} - w_{f,i,t}| - \frac{1}{2} \sum_{i=1}^N |w_{b,i,t} - w_{f,i,t}|, \quad (4)$$

where  $w_{b,i,t-4}$  denotes the weight of security  $i$  included in the benchmark  $b$  portfolio at time  $t-4$ ,  $w_{b,i,t}$  represents the weight of security  $i$  in the benchmark  $b$  at time  $t$ , and  $w_{f,i,t}$  denotes the weight of fund  $f$  for the same security  $i$  at time  $t$ . For the market benchmark  $b$ , I use two indexes: the market capitalization-based S&P 500 index and the ESG-screened index FTSE4Good US Select. I calculate the fund and market changes separately for each benchmark. Estimating these changes requires holding the market portfolio constant; therefore, unlike in the standard *Active Share* calculation, the closest benchmark for a fund cannot vary from quarter to quarter. I choose the S&P 500 as the primary benchmark for estimating market composition, as it is one of the most commonly assigned empirical benchmarks in the sample, according to the results in Section 4.1. Moreover, the *Active Share* relative to the S&P 500, shown in Figure 4(b), effectively captures the declining trend in active management among ESG-oriented funds, closely mirroring the pattern observed when using a broader set of market indexes. To further explore the possibility of a more ESG-oriented market, I additionally compute the changes relative to the FTSE4Good US Select, an ESG-screened index.

Table 3 presents descriptive statistics for the estimated fund and market changes. The mean values for all change measures are close to zero, suggesting that, on average, the compositions of both mutual fund and market portfolios remain relatively stable over time. This indicates that mutual funds and market indexes typically maintain stable portfolio compositions, with limited rebalancing.

The longer tails in the distribution of fund changes indicate substantial heterogeneity across funds in how they adjust relative to the benchmarks. In contrast, the distribution of market shifts exhibits shorter tails, further reinforcing that indexes are rarely subject to significant rebalancing.

Table 3: Summary Statistics: Fund and Market Changes

	Obs.	Mean	Std dev	Median	Min	Max
non-ESG Funds						
Fund Change S&P500	96,068	0.003	0.035	0.000	-0.805	0.887
Fund Change FTSE4Good	96,068	0.003	0.032	0.000	-0.709	0.667
Market Change S&P500	96,068	0.005	0.014	0.001	-0.07	0.189
Market Change FTSE4Good	96,068	0.007	0.023	0.001	-0.127	0.219
ESG-oriented Funds						
Fund Change S&P500	2,166	0.009	0.055	0.001	-0.48	0.59
Fund Change FTSE4Good	2,166	0.009	0.05	0.002	-0.485	0.526
Market Change SP&500	2,166	0.006	0.014	0.002	-0.032	0.126
Market Change FTSE4Good	2,166	0.007	0.023	0.002	-0.108	0.167

This table presents summary statistics for the quarterly estimated fund and market shifts, as defined in Equations 3 and 4, respectively.

Additionally, Figure 6 in the appendix presents the time-series distribution of average fund and market changes. Prior to 2018, ESG-oriented funds exhibited higher average values of the fund change measure, indicating that their portfolios tended to adjust more significantly relative to the market over the subsequent year compared to non-ESG funds. Despite this, the overall directional movements of ESG and non-ESG funds were relatively aligned. However, around 2018, ESG-oriented funds began to deviate substantially in their adjustment patterns. Specifically, they displayed a decrease in fund-to-market shifts around 2018, followed by a sharp increase thereafter. This pattern suggests that, following the Paris Agreement in 2015, ESG-oriented funds initially diverged from market trends, but began realigning with the market around 2018, increasing their portfolio similarity to the market.

Next, I estimate how mutual funds adjusted to the market, and how the market responded to fund portfolios, using December 2015 and December 2018 as two cut-off periods. An increase in the fund change relative to the market for ESG-oriented funds would indicate that the observed decline in their active management is driven by these funds becoming more similar to the market portfolio. Conversely, an increase in the market change relative to ESG-oriented fund portfolios would suggest that the reduction in active management can, at least in part, be attributed to the market itself becoming more aligned with ESG-oriented investment strategies. To assess these dynamics, I employ a panel regression model with the following specification:

$$\begin{aligned}
 Fund(Market)Change_{f,j,t} = & \beta_1 * ESGFund_{f,t} \times Post2015(18)_{f,t} + \beta_2 * ESGFund_{f,t} \\
 & + \beta_3 * Post2015(18)_{f,t} + \beta_4 * X_{f,t-1} + \gamma_j + \theta_y + \varepsilon_{f,t},
 \end{aligned} \tag{5}$$

where  $f$  denotes the CRSP mutual fund portfolio with Lipper investment objective  $j$  in quarter

*t*. The dependent variable,  $Fund(Market)Change_{f,j,t}$ , represents one of the following measures of *Active Share* change: fund change to S&P500, S&P500 change to fund, fund change to FTSE4Good, and FTSE4Good change to fund. The interaction term,  $ESGFund_{ft} \times Post2015(18)_{ft}$ , is the interaction between  $ESGFund_{ft}$  dummy and the  $Post2015(2018)_{ft}$  dummy, as previously defined. The coefficient of interest,  $\beta_1$ , estimates the change in the dependent variable for ESG-oriented funds in the post-2015 (or post-2018) period. A negative and statistically significant  $\beta_1$  for fund changes indicates a decline in how ESG-oriented funds adjust relative to the market in post-periods. Conversely, a positive  $\beta_1$  suggests that, in the period after December 2015(2018), ESG-oriented funds started to align more with market over a subsequent year, relative to the response of non-ESG funds. For market change as the dependent variable, a negative  $\beta_1$  implies that the market is moving away from ESG-oriented fund portfolios over a subsequent year, while a positive  $\beta_1$  indicates that the market is moving closer to the portfolio compositions of ESG-oriented funds after December 2015 (or December 2018), relative to how the market is responding to the portfolios of non-ESG funds. The model includes a vector of lagged control variables,  $X_{ft-1}$ . The control variables are the natural logarithm of fund TNA, the logarithm of fund age, fund flows, four factor alpha, expense ratio and return volatility. As in previous specifications, investment objective fixed effects, denoted by  $\gamma_j$ , are included to ensure comparisons are made within similar fund categories, and year fixed effects,  $\theta_y$ , are used to control for year-specific common trends affecting all funds.

Table 4 presents the results. Columns (1)–(2) and (9)–(10), which examine fund changes relative to the market, show a positive shift in how funds adjusted to the market following December 2015. This indicates that, overall, mutual funds in the sample slightly increased their alignment with market benchmarks or reduced their activeness relative to market indexes, after December 2015. Similar results are observed when using the post-2018 dummy in columns (3)–(4) for fund changes relative to the S&P 500 index. However, in the case of fund adjustments toward the FTSE4Good index, as shown in columns (11)–(12), the post-2018 dummy is not statistically significant, indicating no substantial change in the degree to which funds aligned with this ESG-screened benchmark after December 2018.

The ESG-oriented fund dummy is positive and statistically significant across majority of specifications for fund-to-market change, suggesting that, on average, ESG-oriented funds follow trends in the market portfolio more closely than non-ESG funds with similar investment objectives. However, the interaction terms between the ESG fund dummy and both the post-December 2015, columns (2) and (10), and post-December 2018, columns (4) and (12), dummies are statistically insignificant. This implies that there was no significant difference in how ESG funds adjusted to the market after these dates relative to non-ESG funds to market changes.

Table 4: Fund and Market Changes Panel Regression

	Fund to Change S&P500				S&P500 Change to Fund				Fund Change to FTSE4Good				FTSE4Good Change to Fund			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
ESG Fund*Post2015		-0.002 (-0.318)				0.002* (1.661)				0.0004 (0.063)				0.001 (0.447)		
Post2015	0.013*** (13.583)	0.013*** (13.524)			0.002*** (9.059)	0.002*** (8.806)			0.006*** (7.13)	0.006*** (7.077)			0.001*** (2.996)	0.001*** (2.927)		
ESG Fund*Post2018				-0.0003 (-0.056)				0.004** (2.068)				-0.001 (-0.1)				0.002 (0.909)
Post2018			0.008*** (7.806)	0.008*** (7.862)			0.002*** (8.686)	0.002*** (8.317)			0.001 (1.459)	0.001 (1.481)			-0.003*** (-5.685)	-0.003*** (-5.776)
ESG fund	0.006** (2.394)	0.008** (2.001)	0.006** (2.394)	0.006*** (2.721)	0.001 (0.546)	-0.001 (-0.846)	0.001 (0.546)	-0.001 (-1.002)	0.006** (2.561)	0.005 (1.644)	0.006** (2.561)	0.006*** (2.774)	0.001 (0.403)	-0.0002 (-0.067)	0.001 (0.403)	-0.0004 (-0.201)
logTNA <sub>t-1</sub>	0.0002* (1.702)	0.0002* (1.707)	0.0002* (1.702)	0.0002* (1.701)	0.001*** (4.347)	0.001*** (4.335)	0.001*** (4.347)	0.001*** (4.328)	0.0003** (2.177)	0.0003** (2.172)	0.0003** (2.177)	0.0003** (2.177)	0.001*** (3.789)	0.001*** (3.784)	0.001*** (3.789)	0.001*** (3.781)
logAge <sub>t-1</sub>	-0.001* (-1.814)	-0.001* (-1.826)	-0.001* (-1.814)	-0.001* (-1.826)	0.0003 (0.867)	0.0003 (0.883)	0.0003 (0.867)	0.0003 (0.916)	-0.0003 (-0.779)	-0.0003 (-0.776)	-0.0003 (-0.779)	-0.0003 (-0.786)	0.001* (1.683)	0.001* (1.69)	0.001* (1.683)	0.001* (1.709)
Flows <sub>t-1</sub>	0.002 (0.41)	0.002 (0.413)	0.002 (0.41)	0.002 (0.411)	-0.001 (-0.599)	-0.001 (-0.608)	-0.001 (-0.599)	-0.001 (-0.636)	-0.002 (-0.451)	-0.002 (-0.452)	-0.002 (-0.451)	-0.002 (-0.448)	-0.003 (-1.188)	-0.003 (-1.192)	-0.003 (-1.188)	-0.003 (-1.205)
4F Alpha <sub>t-1</sub>	-0.176* (-1.772)	-0.175* (-1.759)	-0.176* (-1.772)	-0.176* (-1.765)	0.469*** (10.268)	0.468*** (10.232)	0.469*** (10.268)	0.466*** (10.188)	-0.264*** (-2.971)	-0.264*** (-2.968)	-0.264*** (-2.971)	-0.264*** (-2.959)	0.650*** (11.548)	0.65*** (11.535)	0.650*** (11.548)	0.648*** (11.501)
Return Volatility <sub>t-1</sub>	0.09*** (3.156)	0.09*** (3.156)	0.09*** (3.156)	0.09*** (3.156)	0.109*** (6.578)	0.109*** (6.581)	0.109*** (6.578)	0.109*** (6.578)	0.097*** (3.891)	0.097*** (3.893)	0.097*** (3.891)	0.097*** (3.891)	0.013 (0.839)	0.013 (0.84)	0.013 (0.839)	0.013 (0.838)
Expense Ratio <sub>t-1</sub>	-0.117** (-2.343)	-0.117** (-2.353)	-0.117** (-2.343)	-0.117** (-2.35)	-0.163*** (-4.5)	-0.162*** (-4.49)	-0.163*** (-4.5)	-0.162*** (-4.484)	-0.104** (-2.515)	-0.104** (-2.516)	-0.104** (-2.515)	-0.104** (-2.521)	-0.138*** (-3.359)	-0.138*** (-3.351)	-0.138*** (-3.359)	-0.138*** (-3.346)
Adj. R <sup>2</sup>	0.027	0.027	0.027	0.027	0.123	0.123	0.123	0.124	0.034	0.034	0.034	0.034	0.142	0.142	0.142	0.142
FE	Obj, Year	Obj, Year	Obj, Year	Obj, Year	Obj, Year	Obj, Year	Obj, Year	Obj, Year	Obj, Year	Obj, Year	Obj, Year	Obj, Year	Obj, Year	Obj, Year	Obj, Year	Obj, Year
Obs.	79,511	79,511	79,511	79,511	79,511	79,511	79,511	79,511	79,511	79,511	79,511	79,511	79,511	79,511	79,511	79,511

This table reports the estimated changes in the decomposition of *Active Share* into fund and market changes following December 2015 and December 2018. Columns (1)–(4) use the fund change relative to the S&P 500 index as the dependent variable. Columns (5)–(8) examine the S&P 500 index's change toward fund portfolio. In columns (9)–(12), the dependent variable is the fund change relative to the FTSE4Good US Select index, while columns (13)–(16) assess the FTSE4Good US Select index's change toward fund portfolio. Standard errors are clustered at the fund level. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels, respectively. *t*-statistics are reported in parentheses.

Turning to market-to-fund changes, columns (5) and (6) show that, on average, the S&P 500 index became slightly more similar to all fund portfolios after December 2015. A similar trend is observed for the post-December 2018 period, as indicated by the positive and statistically significant coefficient on the post-2018 dummy in columns (7) and (8). For the FTSE4Good index, columns (13) and (14) indicate that, in the post-December 2015 period, the index composition became more aligned with the portfolios of all mutual funds compared to the pre-period. However, this trend reverses after December 2018, as shown by the negative and statistically significant coefficient on the post-2018 dummy in columns (15) and (16), suggesting that the FTSE4Good index, on average, began to diverge from the mutual fund portfolios. The ESG-oriented fund dummies are insignificant across all specifications for market-to-fund changes, suggesting that there is no difference in how market indexes adjust in relation to ESG-oriented funds compared to non-ESG funds.

Importantly, we observe changes in these relationships after the cut-off periods, particularly for the S&P 500's alignment with ESG funds' portfolios in columns (6) and (8). Positive and statistically significant coefficients on the interaction terms between the ESG fund dummy and the post-period indicators suggest that the S&P 500 increased its similarity to ESG-oriented fund portfolios more than to those of non-ESG funds. Specifically, column (6), which captures changes in the S&P 500's alignment with fund portfolios, indicates a greater increase in similarity with ESG-oriented funds compared to non-ESG funds after December 2015. This implies that the market proxied by the S&P 500 narrowed the gap between its composition and that of ESG-oriented funds after this year, although the effect is only marginally significant ( $p$ -value  $< 0.1$ ). A similar but stronger pattern is observed for S&P 500 change to funds post-December 2018, as shown in column (8), with higher statistical significance and coefficient magnitude. In contrast, for the ESG-screened FTSE4Good index, the interaction terms are insignificant in both the post-December 2015 period, column (14), and the post-December 2018 period, column (16), suggesting that FTSE4Good did not move closer to ESG-oriented fund portfolios relative to non-ESG funds post-periods.

In this section, I introduced a novel decomposition of the *Active Share* measure from Cremers and Petajisto (2009) into fund-to-market and market-to-fund changes to analyze the underlying drivers of the previously documented decline in active management among ESG-oriented funds. I first find that all funds began to more closely follow the S&P 500 after both December 2015 and December 2018, and the ESG-screened FTSE4Good index after December 2015. These shifts likely contributed to the overall trend of declining active management. While the results do not indicate that ESG-oriented funds more actively adjusted their portfolios to resemble the market compared to non-ESG counterparts, they do show that the market proxied by the S&P 500 became more similar to the holdings of ESG-oriented funds after December 2018, relative to holdings of non-ESG funds. This suggests that the observed decline in active management, when measured as deviation from the market portfolio, can be partially explained by the market itself shifting toward ESG-oriented portfolios.

## 5.2 Flows to ESG-oriented Funds

Previous studies (e.g., Hartzmark and Sussman (2019); Gantchev et al. (2024)) indicate that ESG-oriented funds experienced substantial investor inflows in the years following the adoption of the Paris Agreement. While theoretical frameworks suggest that higher levels of active management can attract greater inflows, fund flows are highly sensitive to fund financial performance (Chevalier and Ellison, 1997; Berk and Green, 2004; Avramov et al., 2020). As a result, the relationship between active management and fund flows is not straightforward. Although one might expect a positive association, where actively managed funds attract more capital, this relationship may weaken or even reverse if those funds underperform. The objective of this section is to explore how the increase in inflows to ESG-oriented funds may have influenced their level of active management. To do so, I first estimate the change in fund flows to ESG-oriented funds after December 2015 and December 2018. I then examine the relationship between fund flows and active management to assess whether the inflow increase had an impact on the level of active management of ESG-oriented funds.

Figure 5 compares quarterly fund flows to ESG-oriented and non-ESG funds with similar investment objectives. The graphical evidence indicates that ESG-oriented funds experienced higher inflows between the end of 2018 and the beginning of 2022.

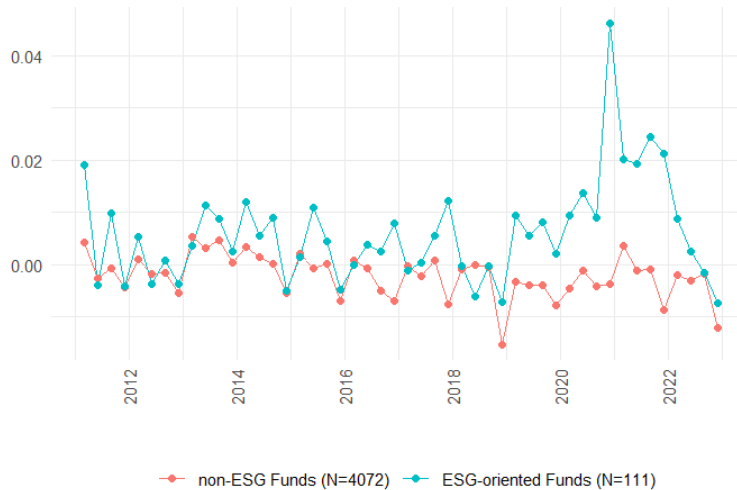


Figure 5: Investors flows to non-ESG and ESG-oriented funds. The red line depicts quarterly average flows to active non-ESG funds ( $N=4,072$ ). The blue line depicts the quarterly average flows to active ESG-oriented funds ( $N=111$ ).

Next, I examine trends in fund flows to ESG-oriented mutual funds using a panel regression framework, focusing on two key periods: post-December 2015 and post-December 2018. The results are reported in Table 5. In column (1), which evaluates the period following December 2015, there is no statistically significant difference in flows to ESG-oriented funds compared to non-ESG funds. However, column (2), which focuses on the post-December 2018 period, reveals a marginally significant increase ( $p$ -value  $< 0.1$ ) in flows to ESG-oriented funds relative to their non-ESG counterparts,

indicating a differential positive change in investor interest after December 2018.

Table 5: Fund Flows to ESG-oriented Funds

	Fund Flows	
	(1)	(2)
ESG Fund*Post2015	0.002 (0.858)	
Post2015	-0.008*** (-9.679)	
ESG Fund*Post2018		0.005* (1.925)
Post2018		-0.001 (-1.234)
ESG fund	0.005** (2.173)	0.004*** (2.678)
logTNA <sub>t-1</sub>	-0.001*** (-4.247)	-0.001*** (-4.256)
logAge <sub>t-1</sub>	-0.004*** (-10.338)	-0.004*** (-10.3)
4F Alpha <sub>t-1</sub>	2.360*** (24.531)	2.358*** (24.492)
Return Volatility <sub>t-1</sub>	0.124*** (3.77)	0.124*** (3.766)
Expense Ratio <sub>t-1</sub>	0.171*** (4.795)	0.171*** (4.808)
Adj. R <sup>2</sup>	0.032	0.032
FE	Obj,Year	Obj,Year
Obs.	80179	80179

This table reports the estimated change in investor flows to ESG-oriented mutual funds following December 2015 and December 2018, based on quarterly panel regressions of the following general form:  $Flows_{f,j,t} = \beta_1 * ESGFund_{f,t} * Post2015(8)_{f,t} + \beta_2 * ESGFund_{f,t} + \beta_3 * Post2015(8)_{f,t} + \beta_4 * logTNA_{f,t-1} + \beta_5 * logAge_{f,t-1} + \beta_6 * 4FAlpha_{f,t-1} + \beta_7 * ReturnVolatility_{f,t-1} + \beta_8 * ExpenseRatio_{f,t-1} + \gamma_j + \theta_y + \varepsilon_{f,t}$ .  $\gamma_j$  denotes investment objective fixed effects and  $\theta_y$  denotes the set of year dummies. Standard errors are clustered at the fund level. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels, respectively.  $t$ -statistics are reported in parentheses.

Although the coefficient is only marginally significant, industry evidence points to a notable increase in inflows to sustainable funds in 2018.<sup>9</sup> This supports the interpretation that the shift in investor interest toward ESG-oriented funds primarily occurred following 2018, with no significant difference observed before that period. Consequently, the post-2018 increase in fund flows may help explain the observed decline in active management after this year. Next, I turn to estimating the relationship between fund flows and active management, focusing on whether this relationship changed specifically for ESG-oriented funds after December 2018.

As previously noted, the relationship between a fund's degree of active management and the flows it attracts remains inconclusive. Fund flows are largely driven by past performance (Chevalier and Ellison, 1997; Berk and Green, 2004; Avramov et al., 2020), and actively managed funds, on average, tend to underperform their passive counterparts (Gruber, 1996; Fama and French, 2010; Berk and Van Binsbergen, 2015), which would imply a tendency for outflows from active funds.

<sup>9</sup>Previously mentioned Morningstar report outlines that ESG funds experienced significant inflows in 2018. Jon Hale, *5 Things to Know About Sustainable Funds*, Morningstar, February 14, 2019 – [Morningstar Website](#).

Nevertheless, a growing body of research documents that certain active strategies and managerial skills can yield superior returns (Kacperczyk et al., 2005; Kacperczyk et al., 2008; Cremers and Pareek, 2016; Cremers et al., 2019), complicating the expected link between activeness and investor flows. Taken together, these findings suggest that managers who lack a skill and experience in generating excess returns may prefer more passive investment approaches as a strategy to retain investor capital.

The results documenting the overall change in active management presented in Table 2, where fund flows are included as a control variable, indicate a positive association between fund flows in the preceding period and a fund’s subsequent level of active management, as measured by deviations from market indexes. To further explore this relationship, I extend the analysis by estimating a panel regression model with a triple interaction effect to examine whether the association between fund flows and active management has changed for ESG-oriented funds in the period following 2018, a year marked by a substantial increase in investor capital directed toward these funds. The analysis is employs the following model specification:

$$\begin{aligned}
ActiveManagement_{f,j,t} = & \beta_1 * ESGFund_{f,t} \times Post2018_{f,t} \times Flows_{f,t-1} \\
& + \beta_2 * ESGFund_{f,t} \times Flows_{f,t-1} + \beta_3 * Post2018_{f,t} \times Flows_{f,t-1} \\
& + \beta_4 * Post2018_{f,t} \times ESGFund_{f,t} + \beta_5 * Post2018_{f,t} + \beta_6 * ESGFund_{f,t} \\
& + \beta_7 * X_{f,t-1} + \gamma_j + \theta_y + \varepsilon_{f,t}
\end{aligned} \tag{6}$$

All variables and notations are defined as in previous sections. The primary coefficient of interest is the triple interaction term,  $\beta_1$ , which captures the change in the relationship between fund flows and active management for ESG-oriented funds after December 2018, relative to non-ESG funds.

Table 6 presents the results of the regression examining whether the relationship between fund flows and active management changed for ESG-oriented funds after 2018. Column (1) suggests that, following 2018, fund flows were positively correlated with active management for all funds, as indicated by the positive and statistically significant interaction between the fund flows variable and the post-December 2018 dummy. However, this relationship appears to be reversed for ESG-oriented funds after December 2018. The triple interaction term capturing the interaction between fund flows, the post-2018 period, and the ESG fund dummy is negative, although only weakly significant ( $p$ -value  $< 0.1$ ). This suggests that while increased flows were associated with greater active management among non-ESG funds post-2018, ESG-oriented funds may have experienced a different dynamic, reflecting the influence of inflows on their reduced activeness.

This relationship does not hold when using the *Active Share ESG* measure, as shown in column (2), which indicates no significant association between fund flows and the activeness of ESG-oriented funds after December 2018 under this specification. This suggests that increased investor flows primarily influenced fund active deviation from traditional market-capitalization indexes, rather

than ESG-screened benchmarks. This outcome is intuitive, as growing inflows likely compelled ESG-oriented funds to allocate more capital to larger stocks (Lowry et al., 2023), thereby increasing their resemblance to broader market indexes. For the activeness measure proposed by Pástor et al. (2020), the triple interaction term remains negative, as seen in column (3), reinforcing the earlier finding that inflows are associated with reduced active management among ESG-oriented funds in the post-2018 period. Consistent with previous results, no significant effect is observed when portfolio turnover is used as the measure of active management.

Table 6: Fund Flows and Active Management

	Active Share (1)	Active Share ESG (2)	Activeness P2020 (3)	Turnover (4)
ESG Fund*Post2018*Flows <sub>t-1</sub>	-0.445* (-1.905)	-0.201 (-0.768)	-237.2** (-2.118)	-0.529 (-0.65)
ESG fund* Flows <sub>t-1</sub>	0.269 (1.58)	0.034 (0.187)	125.5 (1.212)	0.308 (0.426)
Post2018*Flows <sub>t-1</sub>	0.073** (2.283)	0.025 (0.985)	25.32 (1.587)	0.151 (1.356)
ESG fund*Post2018	-0.041* (-1.886)	-0.044** (-2.053)	-4.8 (-0.962)	0.053 (1.399)
ESG fund	0.041** (2.397)	-0.017 (-0.956)	-5.76 (-1.029)	-0.127*** (-3.394)
Post2018	-0.017*** (-4.659)	-0.033*** (-10.818)	0.642 (0.392)	-0.026** (-2.369)
Flows <sub>t-1</sub>	-0.018 (-0.866)	0.022 (1.358)	7.777 (0.711)	0.006 (0.08)
4F Alpha <sub>t-1</sub>	-0.738 (-1.441)	-1.752*** (-4.31)	-654.2*** (-2.857)	-9.392*** (-5.769)
logTNA <sub>t-1</sub>	-0.013*** (-9.811)	-0.01*** (-8.659)	-1.646*** (-3.967)	0.002 (0.673)
logAge <sub>t-1</sub>	0.002 (0.495)	-0.003 (-0.79)	-8.598*** (-6.66)	-0.064*** (-6.065)
Return Volatility <sub>t-1</sub>	0.478*** (2.93)	0.942*** (6.98)	290.4*** (5.334)	2.395*** (5.554)
Expense Ratio <sub>t-1</sub>	6.129*** (13.867)	3.579*** (10.373)	4658.8*** (33.123)	44.54*** (43.833)
Adj. R <sup>2</sup>	0.393	0.493	0.36	0.302
FE	Obj,Year	Obj,Year	Obj,Year	Obj,Year
Obs.	80,179	80,179	80,179	80,179

This table reports the estimated association between fund flows and active management. Column (1) uses *Active Share* calculated following the methodology of Cremers and Petajisto (2009) as the dependent variable. Column (2) uses *Active Share ESG*, which incorporates ESG-screened benchmarks into calculation of *Active Share*. Column (3) employs the activeness measure developed by Pástor et al. (2020) as the dependent variable. In column (4), the dependent variable is portfolio turnover ratio. Standard errors are clustered at the fund level. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels, respectively. *t*-statistics are reported in parentheses.

The results indicate that the rise in investor inflows to ESG-oriented funds after December 2018 contributed to a reduction in their level of active management. This pattern is particularly evident when active management is measured relative to traditional market-capitalization benchmarks. The findings imply that ESG funds may have responded to growing investor demand by shifting toward less active, more benchmark-aligned strategies, allocating more capital to large-cap stocks as increased inflows required broader, more scalable investments.

## 6 Extensions

### 6.1 Pre-Trends

While estimating the differential change in active management of ESG-oriented funds in Section 4.2.2, it is important to address the concern that the observed change is not a continuation of a pre-existing trend. In other words, it is crucial to verify that significant differences in active management between ESG-oriented and non-ESG funds did not emerge prior to 2018. Figure 8 in the appendix displays the estimated interaction terms between the ESG-oriented fund dummy and year-specific dummy variables.<sup>10</sup> This allows for testing year-by-year differences in active management between ESG and non-ESG funds. The estimated coefficients suggest that ESG-oriented funds did not differ from non-ESG funds in the level of active management prior to December 2018. Using 2018 as the reference year, the results indicate no significant pre-trends, that is, there were no differences in active management between ESG and non-ESG funds in the years before 2018. However, starting in 2019, the interaction term becomes negative and statistically significant, reflecting a relative decline in the active management of ESG funds compared to their non-ESG counterparts. This effect remains significant in the following years, confirming 2018 as a pivotal turning point when ESG-oriented funds began to experience a notable difference in active management. Consistent with the baseline findings, alternative measures such as the activeness measure proposed by Pástor et al. (2020) and the portfolio turnover ratio show no differential changes for ESG-oriented funds, with all corresponding interaction terms statistically indistinguishable from zero.

### 6.2 Rise in ESG-screened Market Indexes

The attention drawn to ESG-oriented investing by the Paris Agreement sparked the introduction of a wide range of new ESG-screened indexes. This expansion created more opportunities for passive investment strategies that align with ESG criteria. To account for growing universe of passive ESG-oriented investment options in estimation of active management, I extend the set of benchmarks used in the estimation of *Active Share* by including nine additional indexes introduced after 2016: the MSCI ACWI Low Carbon Target Index, MSCI ACWI Climate Paris Aligned Index, MSCI USA Gender Diversity Select Index, MSCI ACWI Sustainable Impact Index, MSCI EAFE ESG Focus Index, MSCI Emerging Markets ESG Focus Index, MSCI World SRI Index, STOXX Global ESG Select KPIs Index, and STOXX USA ESG Select KPIs Index. I then re-calculate the *Active Share* measure using this expanded benchmark set referred to as *Active Share ESG2* and re-estimate trends in the active management of ESG-oriented funds relative to non-ESG funds with similar investment objectives.

Table 7 presents the regression results using *Active Share ESG2* as the dependent variable in

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<sup>10</sup>Figure 7 provides analogous estimates using 2015 as the reference year. Consistent with earlier findings in Table 2, no significant changes in active management for ESG funds relative to non-ESG funds were observed following that year.

the empirical model outlined in Equation 2. The overall decline in active management across all funds following both December 2015 and December 2018 remains statistically significant, with a larger coefficient magnitude observed for the post-2018 period. However, the differential decrease for ESG-oriented funds is only weakly significant ( $p$ -value  $< 0.1$ ) for the post-2018 specification and insignificant for post-2015 specification. The results largely follow the pattern observed in the main analysis; however, the inclusion of an additional set of ESG-screened benchmarks reduces the differential change for ESG-oriented funds after December 2018.

Table 7: Decrease in Active Management of ESG-oriented Funds: Extended ESG-screened Indexes

	Active Share ESG2	
	(1)	(2)
ESG Fund*Post2015	-0.019 (0.935)	
Post2015	-0.008*** (-3.512)	
ESG Fund*Post2018		-0.039* (1.178)
Post2018		-0.025*** (-6.758)
ESG Fund	0.016 (0.935)	0.021 (1.178)
logTNA $_{t-1}$	-0.012*** (-8.984)	-0.012*** (-8.977)
logAge $_{t-1}$	0.001 (0.228)	0.001 (0.196)
Flows $_{t-1}$	0.029 (1.585)	0.029 (1.616)
4F Alpha $_{t-1}$	-2.577*** (-4.775)	-2.560*** (-4.739)
Return Volatility $_{t-1}$	0.595*** (3.634)	0.596*** (3.64)
Expense Ratio $_{t-1}$	6.008*** (13.584)	6.004*** (13.579)
Adj. R <sup>2</sup>	0.325	0.326
FE	Obj,Year	Obj,Year
Obs.	80,179	80,179

This table reports the estimated decrease in active management among ESG-oriented mutual funds after December 2015 (December 2018). The dependent variable is *Active Share ESG2*, which uses 20 market capitalization and 16 ESG-screened indexes in the calculation of *Active Share*. Standard errors are clustered at the fund level. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels, respectively.  $t$ -statistics are reported in parentheses.

The convergence between the market portfolio and ESG-oriented portfolios, along with the introduction of a large number of new ESG-screened indexes, raises the question of whether capitalization-weighted indexes differ substantially from ESG-screened indexes. Next, I apply the concept underlying the *Active Share* measure to examine the similarity between market capitalization indexes and ESG-screened indexes. Figure 10 in the appendix displays the distribution of average portfolio differences between the two types of indexes. Overall, market capitalization indexes differ largely from ESG-screened indexes, with portfolio differences of no less than 70%, both for benchmarks present throughout the whole sample period and for those introduced after 2016. Notably, in recent

years, market indexes have shown a steady increase in similarity with four ESG-screened indexes: the FTSE4Good US Select Index, MSCI KLD 400 Social ex Fossil Fuels Index, MSCI KLD 400 Social Index, and MSCI USA ESG Select Index.

### 6.3 Small vs. Large ESG-oriented Funds

One might expect the decline in active management to differ between smaller and larger ESG-oriented funds, given that larger funds typically have greater exposure to the market. In this section, I divide ESG-oriented funds based on their total net assets (TNA) in the previous quarter. Funds with TNA below the median are classified as small, while those above the median are classified as large. Table 8 contains regression results with the estimated decline in active management for these subgroups: small vs. large ESG-oriented funds. The results indicate that among small ESG-oriented funds, the coefficient on the post-2018 dummy is negative and statistically significant when using both *Active Share* and *Active Share ESG*. In contrast, for the subsample of large ESG-oriented funds, the post-period coefficients are not statistically significant. These findings suggest that the differential decline in active management after 2018 was primarily relevant for smaller ESG-oriented funds. Interestingly, the results also show that large ESG-oriented funds significantly increased their trading frequency, as measured by portfolio turnover, following December 2015.

### 6.4 ESG-oriented Funds after 2015

Alternatively, a potential concern is that the observed decline in active management among ESG-oriented funds may be driven by funds that were launched more recently, in response to the growing attention to sustainable investing. These newer funds, with less experience in ESG integration and active stock selection, may be more inclined to adopt passive investment strategies to deliver returns. To address this concern, Table 12 in the appendix presents estimates of the baseline specification (equation 2) using a restricted sample that excludes funds whose first offer date was after December 2015. The number of ESG-oriented funds remaining in this restricted sample is 69.

For this subsample, the statistical significance of the interaction term is weaker, indicating only marginal significance ( $p$ -value  $< 0.1$ ) for the differential change in active management among ESG-oriented funds after December 2018 relative to non-ESG funds with similar investment objectives. This result holds when active management is measured using either *Active Share* or *Active Share ESG*. Nevertheless, the overall decline in active management across all funds post-December 2018 remains statistically significant, as shown by the negative and significant coefficients on the post-2018 dummy variable. Notably, the reduction is more pronounced when active management is measured by ESG-screened *Active Share ESG* than by the market-cap based *Active Share*. Thus, while the reduced number of ESG-oriented funds in the restricted sample lowers statistical power, the core findings, a general decline in active management and a differential effect for ESG-oriented funds remain robust. These results suggest that the observed decline is not solely driven by newly

launched funds.

Table 8: Decrease in Active Management of ESG-oriented Funds: Small vs. Large Funds

PANEL A:		Small ESG-oriented funds							
	Active Share		Active Share ESG		Activeness P2020		Turnover		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
Post2015	-0.009		-0.007		-4.84		0.053		
	(-0.268)		(-0.216)		(-0.502)		(0.881)		
Post2018		-0.064**		-0.085***		2.913		0.111	
		(-2.191)		(-3.007)		(0.296)		(1.515)	
logTNA <sub>t-1</sub>	-0.022	-0.022	-0.016	-0.016	10.23**	10.23**	0.111**	0.111**	
	(-0.866)	(-0.866)	(-0.675)	(-0.675)	(2.054)	(2.054)	(2.166)	(2.166)	
logAge <sub>t-1</sub>	0.02	0.02	0.053	0.053	-3.415	-3.415	-0.108	-0.108	
	(0.469)	(0.469)	(1.323)	(1.323)	(-0.675)	(-0.675)	(-1.162)	(-1.162)	
Flows <sub>t-1</sub>	0.131	0.131	0.111	0.111	76.63	76.63	0.638	0.638	
	(0.84)	(0.84)	(0.765)	(0.765)	(1.069)	(1.069)	(1.151)	(1.151)	
4F Alpha <sub>t-1</sub>	3.945	3.945	3.851	3.851	1498.8*	1498.8*	4.358	4.358	
	(0.545)	(0.545)	(0.657)	(0.657)	(1.772)	(1.772)	(0.637)	(0.637)	
Return Volatility <sub>t-1</sub>	0.926	0.926	1.778	1.778**	1.778**	373.5	5.022**	5.022**	
	(1.034)	(1.034)	(2.016)	(2.016)	(2.016)	(1.546)	(2.453)	(2.453)	
Expense Ratio <sub>t-1</sub>	5.978	5.978	7.025	7.025	3063.2***	3063.2***	30.40***	30.40***	
	(1.244)	(1.244)	(1.544)	(1.544)	(5.891)	(5.891)	(4.521)	(4.521)	
Adj. R <sup>2</sup>	0.532	0.532	0.52	0.52	0.568	0.568	0.359	0.359	
FE	Obj,Year	Obj,Year	Obj,Year	Obj,Year	Obj,Year	Obj,Year	Obj,Year	Obj,Year	
Obs.	722	722	722	722	722	722	722	722	
PANEL B:		Large ESG-oriented funds							
	Active Share		Active Share ESG		Activeness P2020		Turnover		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
Post2015	-0.012		-0.017		13.916*		0.149***		
	(-0.512)		(-0.615)		(1.669)		(2.895)		
Post2018		-0.026		-0.03		4.128		0.038	
		(-0.912)		(-0.926)		(0.494)		(0.722)	
logTNA <sub>t-1</sub>	-0.005	-0.005	-0.009	-0.009	-4.161	-4.161	-0.004	-0.004	
	(-0.267)	(-0.267)	(-0.405)	(-0.405)	(-1.04)	(-1.04)	(-0.12)	(-0.12)	
logAge <sub>t-1</sub>	0.032	0.032	0.043	0.043	1.648	1.648	-0.087	-0.087	
	(1.174)	(1.174)	(1.586)	(1.586)	(0.25)	(0.25)	(-1.571)	(-1.571)	
Flows <sub>t-1</sub>	-0.014	-0.014	-0.117	-0.117	-38.111	-38.11	-0.109	-0.109	
	(-0.09)	(-0.09)	(-0.71)	(-0.71)	(-0.978)	(-0.978)	(-0.306)	(-0.306)	
4F Alpha <sub>t-1</sub>	4.527	4.527	3.501	3.501	101.58	101.6	-16.06*	-16.06*	
	(1.033)	(1.033)	(0.732)	(0.732)	(0.078)	(0.078)	(-1.883)	(-1.883)	
Return Volatility <sub>t-1</sub>	-0.111	-0.111	0.11	0.11	121.4	121.4	1.487	1.487	
	(-0.186)	(-0.186)	(0.156)	(0.156)	(0.963)	(0.963)	(1.605)	(1.605)	
Expense Ratio <sub>t-1</sub>	10.39*	10.39*	13.36**	13.36**	4774***	4774***	36.91***	36.91***	
	(1.655)	(1.655)	(1.969)	(1.969)	(5.791)	(5.791)	(6.658)	(6.658)	
Adj. R <sup>2</sup>	0.452	0.452	0.45	0.45	0.49	0.49	0.413	0.413	
FE	Obj,Year	Obj,Year	Obj,Year	Obj,Year	Obj,Year	Obj,Year	Obj,Year	Obj,Year	
Obs.	938	938	938	938	938	938	938	938	

This table reports the estimated decrease in active management among ESG-oriented mutual funds after December 2015 (December 2018). Columns (1)-(3) use *Active Share* calculated following the methodology of Cremers and Petajisto (2009) as the dependent variable. Columns (4)-(6) use *Active Share ESG*, which incorporates ESG-screened benchmarks into calculation of *Active Share*. Columns (7)-(9) employ the activeness measure developed by Pástor et al. (2020) as the dependent variable. In columns (10)-(12), the dependent variable is portfolio turnover ratio. PANEL A shows the results for small ESG-oriented funds, i.e. funds with TNA below median value in a previous quarter, while PANEL B show results for large ESG-oriented funds. Standard errors are clustered at the fund level. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels, respectively. *t*-statistics are reported in parentheses.

## 7 Conclusion

The complexity of ESG and sustainability-related information, combined with growing investor interest in responsible investing, places greater pressure on managers of ESG-oriented funds to exercise diligence in stock selection. This effort is often reflected in higher levels of active management, measured as the degree of deviation from traditional market index benchmarks. Active management can be especially important for ESG-oriented funds, which are expected to demonstrate careful selection of genuinely responsible investments.

The striking finding of this paper is that, despite the foundational role of stock selection in ESG investing, active management among ESG-oriented funds has declined in recent years. While active management relative to market benchmarks decreased across all U.S.-based mutual funds, ESG-oriented funds experienced an additional 5% decline in their active management levels after 2018, compared to non-ESG funds with similar investment objectives. Additionally, when active management is assessed relative to ESG-screened market indexes, all mutual funds, regardless of ESG orientation, demonstrated a significant increase in similarity with these indexes: by 2% after December 2015, and 4% after December 2018. This convergence toward ESG-specific indexes suggests that ESG integration has become more mainstream, potentially reducing the distinction between ESG and non-ESG fund strategies in practice.

To help explain the observed decline in active management, this paper introduces a decomposition of the active management measure into two components: fund-to-market and market-to-fund changes. While there is no evidence that ESG-oriented funds began to more closely replicate the composition of major market indexes, specifically the S&P 500 and the FTSE4Good US Select relative to non-ESG funds, the analysis reveals a notable shift in the opposite direction. After December 2018, the S&P 500 began to align more closely with the portfolios of ESG-oriented funds than with those of non-ESG funds, suggesting that changes in market benchmarks, rather than fund behavior alone, contributed to the observed decrease in active management. As ESG characteristics become more widespread in benchmark indexes, the informational advantage or strategic necessity of ESG-specific active management may have diminished. Furthermore, the growing influence of large asset managers with ESG mandates could play a role in this shift, as their engagement and voting practices may indirectly shape index inclusion criteria and corporate behaviors.

Additionally, the paper finds that increased inflows to ESG-oriented funds contributed to the decline in their active management, particularly after December 2018. During this period, ESG-oriented funds received higher investor inflows than non-ESG funds with similar investment objectives. Notably, the relationship between fund inflows and active management reversed for ESG-oriented funds after 2018: whereas inflows were previously associated with increased activeness, they became negatively correlated. This shift suggests that as ESG funds attracted more capital, their managers may have adopted more passive, benchmark-aligned investment strategies, possibly due to a lack of stock-selection skills, scalability constraints, or a desire to retain investor capital.

Therefore, in examining the evolution of active management among conventional and ESG-oriented US mutual funds, this paper sheds light on broader shifts in market attitudes toward responsible investment. Specifically, the finding that the distinction between ESG-oriented fund portfolios and the market portfolio has narrowed in recent years, driven by the market's shift toward ESG fund composition, suggests that preferences for securities with stronger ESG characteristics have entered the mainstream market and are increasingly integrated into conventional investment strategies. This is further supported by a general decline in active management relative to ESG-screened portfolios across all U.S. mutual funds. The observed trend aligns with Edmans (2023)'s argument that ESG investing is fundamentally conventional investing, as ESG-related risks are just as relevant to firm value as traditionally recognized non-ESG risks. Understanding the extent to which this decline in active management affects the real-world sustainability outcomes of ESG investing remains a key avenue for future research.

The paper concludes with the caveat that the mechanisms contributing to the decline in active management among ESG-oriented funds were significant across different time periods. This suggests that the decrease may be driven by multiple factors operating at distinct times. These findings underscore the need for further research into the drivers of the observed decline, potentially disentangling the relative importance of each factor.

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## 8 Appendix

Table 9: Variables Definitions

Variable Name	Definition
PANEL A: FUNDS' ACTIVENESS	
<i>Active Share</i>	The measure of fund's activeness against 20 market cap. indexes, calculated following (Cremers and Petajisto, 2009). The active share of fund $f$ in quarter $t$ is defined as: $AS_{ft} = \frac{1}{2} \sum_{i=1}^N  w_{fjt} - w_{bjt} $ , where $b$ denotes a benchmark. For each fund and quarter, the fund's active share is the lowest active share from 20 active shares calculated against each benchmark in the set.
<i>Active Share ESG</i>	The measure of fund's activeness against 7 ESG-screened indexes, calculated following (Cremers and Petajisto, 2009). The active share of fund $f$ in quarter $t$ is defined as: $AS_{ft} = \frac{1}{2} \sum_{i=1}^N  w_{fjt} - w_{bjt} $ , where $b$ denotes a benchmark. For each fund and quarter, the fund's active share is the lowest active share from 27 active shares calculated against each benchmark in the set.
<i>Active Share ESG2</i>	The measure of fund's activeness against 20 market cap. and 16 ESG-screened indexes, calculated following (Cremers and Petajisto, 2009). The active share of fund $f$ in quarter $t$ is defined as: $AS_{ft} = \frac{1}{2} \sum_{i=1}^N  w_{fjt} - w_{bjt} $ , where $b$ denotes a benchmark. For each fund and quarter, the fund's active share is the lowest active share from 36 active shares calculated against each benchmark in the set.
<i>Activeness</i>	The empirical measure of fund activeness proposed by Pástor et al. (2020). The measure is calculated as the portfolio turnover ratio multiplied by the portfolio's liquidity raised to the power of -1/2.
<i>Turnover Ratio</i>	Fund's turnover ratio. Minimum (of aggregated sales or aggregated purchases of securities), divided by the average 12-month total net assets of the fund.
<i>Fund Change S&amp;P500</i>	The difference between the fund portfolio a year ago and the S&P500 index, compared to the difference between the current fund portfolio and the S&P500, formally defined as: $FundChange_{f,t} = \frac{1}{2} \sum_{i=1}^N  w_{f,i,t-4} - w_{b,i,t}  - \frac{1}{2} \sum_{i=1}^N  w_{f,i,t} - w_{b,i,t} $ .
<i>Fund FTSE4Good</i>	The difference between the fund portfolio a year ago and the FTSE4Good US Select index, compared to the difference between the current fund portfolio and the FTSE4Good US Select, formally defined as $FundChange_{f,t} = \frac{1}{2} \sum_{i=1}^N  w_{f,i,t-4} - w_{b,i,t}  - \frac{1}{2} \sum_{i=1}^N  w_{f,i,t} - w_{b,i,t} $ .
<i>Market S&amp;P500</i>	The difference between the S&P500 index composition a year ago and a fund portfolio, compared to the difference between the current S&P500 composition and the fund portfolio, formally defined as: $MarketChange_{b,t} = \frac{1}{2} \sum_{i=1}^N  w_{b,i,t-4} - w_{f,i,t}  - \frac{1}{2} \sum_{i=1}^N  w_{b,i,t} - w_{f,i,t} $ .
<i>Market FTSE4Good</i>	The difference between the FTSE4Good US Select index composition a year ago and a fund portfolio, compared to the difference between the current FTSE4Good US Select composition and the fund portfolio, formally defined as: $MarketChange_{b,t} = \frac{1}{2} \sum_{i=1}^N  w_{b,i,t-4} - w_{f,i,t}  - \frac{1}{2} \sum_{i=1}^N  w_{b,i,t} - w_{f,i,t} $ .
PANEL B: FUNDS' CHARACTERISTICS	
<i>logTNA</i>	Natural logarithm of a fund's quarter-end total net assets. Reported in millions \$.
<i>logAge</i>	Natural logarithm of a fund's age, calculated as the number of years since the date when the fund was first offered.
<i>Flows</i>	Fund's quarterly flows, calculated as $Flows_{ft} = \frac{TNA_{ft} - TNA_{ft-1} \times (1 + R_{ft})}{TNA_{ft-1}}$ .
<i>BH Returns</i>	Fund's quarterly buy-and-hold returns.

<i>4F Alphas</i>	Fund's quarterly alpha, estimated using Fama-French-Carhart four-factor model on a rolling-window between month t-36 to t-1.
<i>Return volatility</i>	Standard deviation of quarterly buy-and-hold returns of a fund.
<i>Number of Holdings</i>	Number of positions in fund's portfolio at each quarter.
<i>Lipper investment objectives</i>	Lipper investment objectives of a mutual funds sourced from CRSP. Objectives are assigned based on the language used in the fund's prospectus to describe its investment strategy.
<i>Management fee</i>	Management fee divided by the average net assets, in percentage, as reported by CRSP.
<i>Expense ratio</i>	Fund's expense ratio. The ratio of total investment that shareholders pay for the fund's operating expenses, which include 12b-1 fees.

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Table 10: Pearson Correlations

	Active Share	Active Share ESG	Activeness Pastor 2020	Turnover Ratio	Fund Shift S&P500	Market Shift S&P500	Fund Shift FTSE4Good	Market Shift FTSE4Good	log TNA	log Age	Fund Flows	Expense Ratio	Buy-and-hold Returns	4 Factor Alpha	Return Volatility
Active Share	1														
Active Share ESG	0.84***	1													
Activeness Pastor 2020	0.367***	0.285***	1												
Turnover Ratio	0.07***	0.09***	0.67***	1											
Fund Shift S&P500	-0.222***	-0.238***	-0.064***	-0.011***	1										
Market Shift S&P500	-0.428***	-0.453***	-0.076***	0.033***	0.173***	1									
Fund Shift FTSE4Good	-0.217***	-0.267***	-0.066***	-0.011***	0.875***	0.185***	1								
Market Shift FTSE4Good	-0.345***	-0.398***	-0.071***	0.006*	0.14***	0.592***	0.209***	1							
logTNA	-0.166***	-0.16***	-0.112***	-0.095***	0.003	0.078***	0.008**	0.071***	1						
logAge	-0.09***	-0.083***	-0.153***	-0.117***	-0.002	0.036***	0.003	0.02***	0.34***	1					
Flows	0.032***	0.025***	0.041***	0.019***	-0.012***	0.009***	-0.012***	0.007**	-0.029***	-0.171***	1				
Expense Ratio	0.258***	0.204***	0.423***	0.543***	-0.021***	-0.078***	-0.02***	-0.057***	-0.108***	-0.058***	0.031***	1			
Buy-and-hold Returns	-0.036***	-0.024***	-0.027***	-0.005*	-0.009***	0.077***	-0.006*	0.033***	0.022***	0	0.032***	-0.004	1		
4F Alpha	-0.171***	-0.136***	-0.178***	-0.061***	-0.01***	0.116***	-0.009**	0.16***	0.099***	-0.035***	0.133***	-0.028***	0.053***	1	
Return volatility	0.016***	0.067***	0.009***	0.021***	0.023***	0.033***	0.029***	0.038***	-0.027***	0.061***	-0.023***	-0.023***	-0.416***	-0.216***	1

This table reports the estimated Pearson correlation coefficients among the main variables used in the empirical analysis. Variable definitions are provided in Table 9. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 11: ESG-oriented funds over time

Year	Number of ESG-oriented funds	Assets held (m.\$)
2011	46	60,166
2012	44	80,316
2013	48	98,052
2014	50	107,315
2015	47	123,337
2016	54	133,473
2017	52	165,837
2018	57	177,639
2019	61	211,619
2020	66	239,189
2021	79	363,672
2022	82	341,132

This table reports the total number of ESG-oriented funds identified each year with the cumulative total net assets they hold.

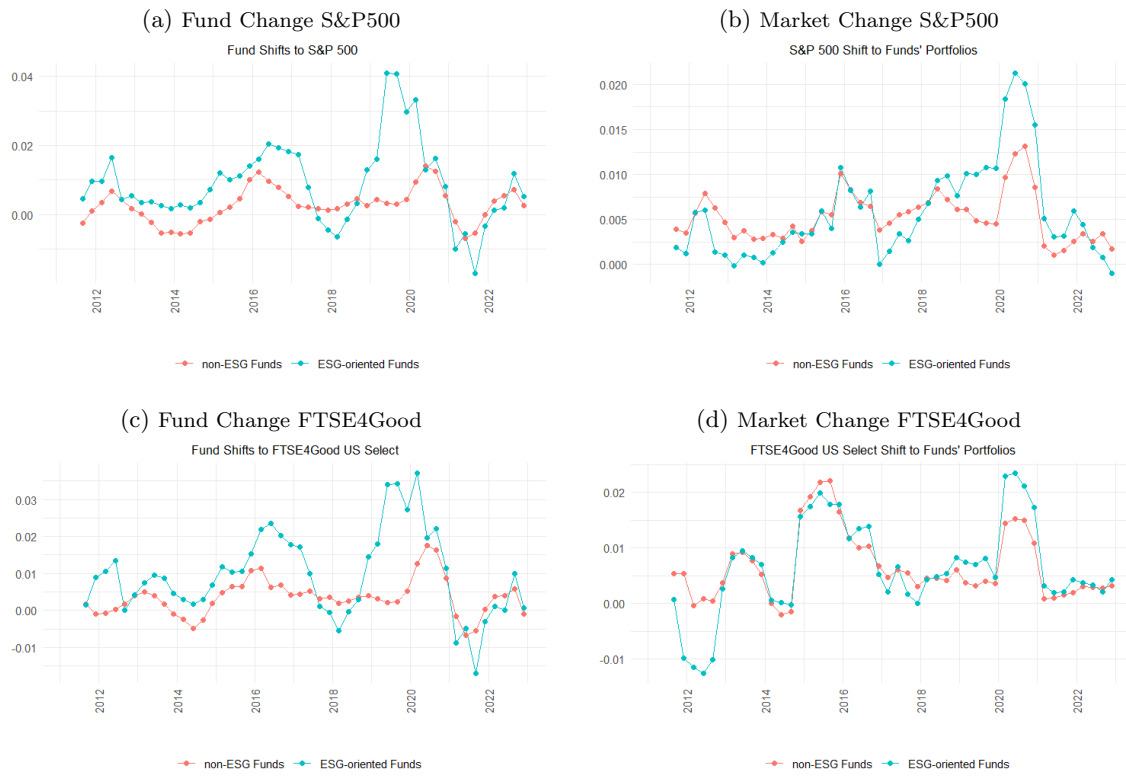


Figure 6: The figure displays the distribution of fund and market changes calculated as defined in Equation 3 and Equation 4 over the sample period for non-ESG and ESG-oriented funds.

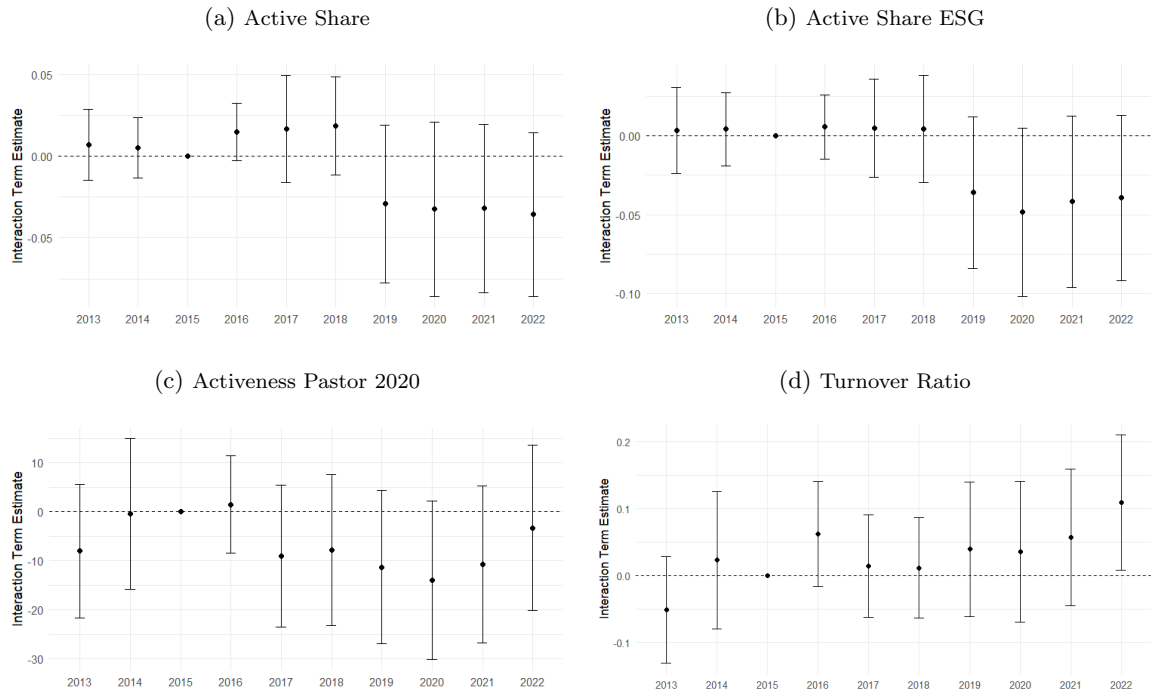


Figure 7: The figure presents the estimated interaction terms between the ESG fund dummy and a series of year dummy variables, based on the following regression specification:  $ActiveManagement_{f,t,j} = \beta_1 * ESGfund_{f,t} \times \theta_y + \beta_2 * ESGfund_{f,t} + \beta_3 \times X_{f,t-1} + \gamma_j + \theta_y + \varepsilon_{f,t}$ , where  $\theta_y$  represents year dummies,  $\gamma_j$  denotes investment objective fixed effects, and  $X_{f,t-1}$  includes lagged control variables. Fig.(a) uses *Active Share* as the dependent variable, while fig.(b) presents results for *Active Share ESG*. Fig.(c) employs the activeness measure of Pástor et al. (2020), and fig.(d) reports estimates for the portfolio turnover ratio. The year 2015 is omitted and serves as the reference category for the year dummies.

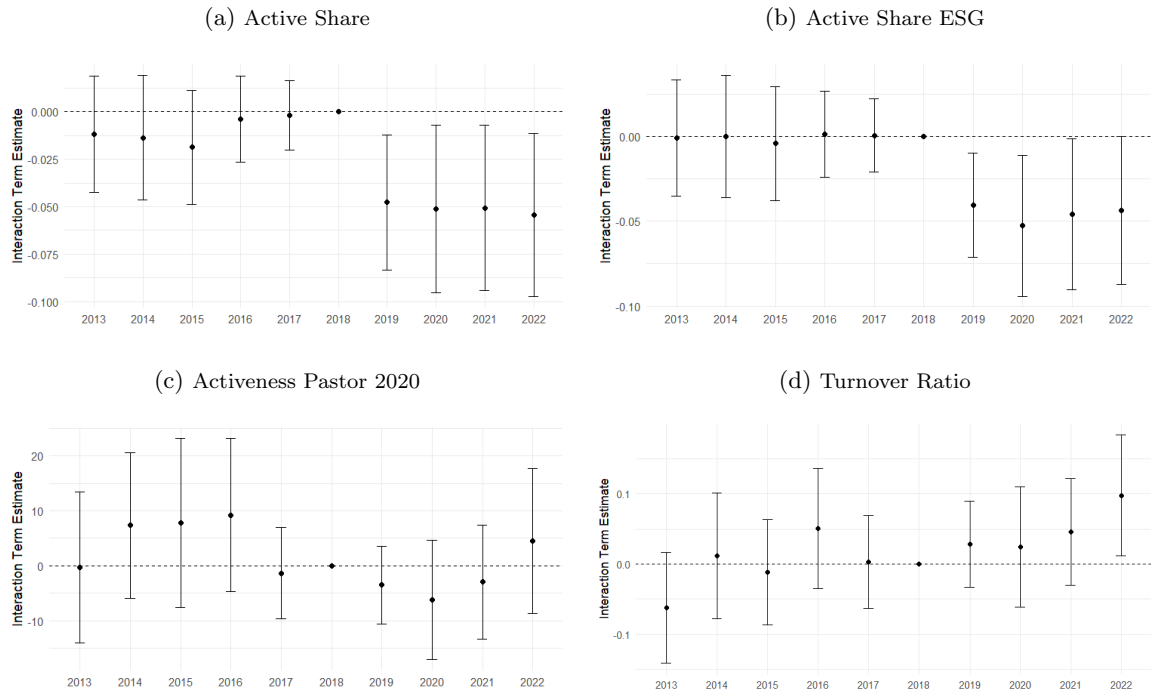


Figure 8: The figure presents the estimated interaction terms between the ESG fund dummy and a series of year dummy variables, based on the following regression specification:  $ActiveManagement_{f,t,j} = \beta_1 * ESGfund_{f,t} \times \theta_y + \beta_2 * ESGfund_{f,t} + \beta_3 \times X_{f,t-1} + \gamma_j + \theta_y + \varepsilon_{f,t}$ , where  $\theta_y$  represents year dummies,  $\gamma_j$  denotes investment objective fixed effects, and  $X_{f,t-1}$  includes lagged control variables. Fig.(a) uses *Active Share* as the dependent variable, while fig.(b) presents results for *Active Share ESG*. Fig.(c) employs the activeness measure of Pástor et al. (2020), and fig.(d) reports estimates for the portfolio turnover ratio. The year 2018 is omitted and serves as the reference category for the year dummies.

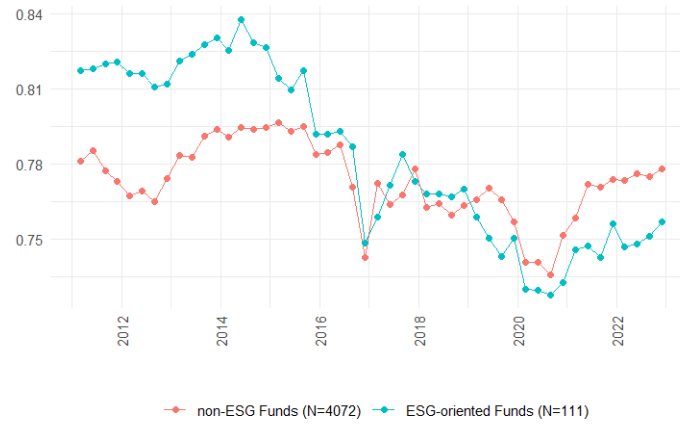
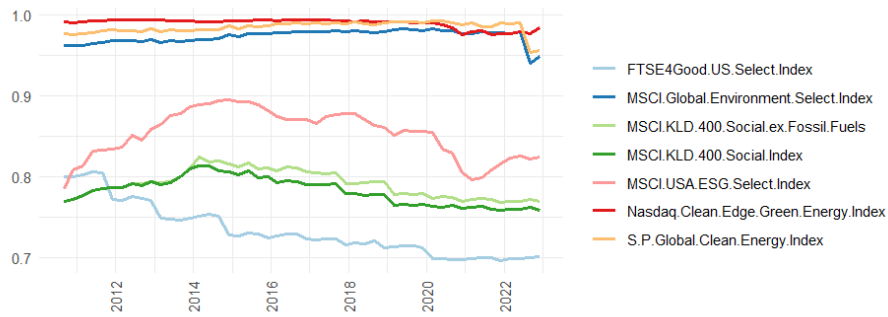
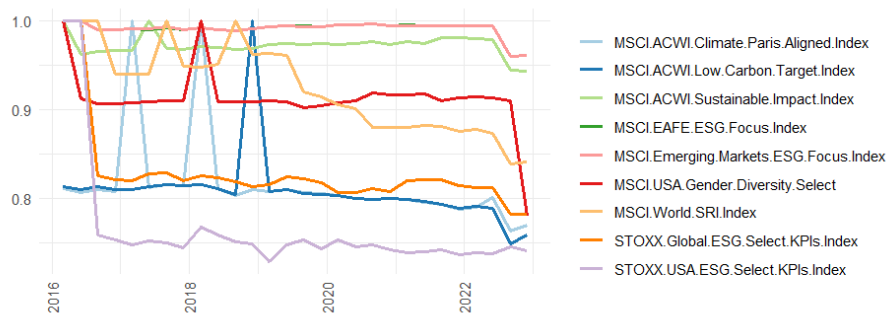


Figure 9: Active Share for non-ESG and ESG-oriented funds. The active share is calculated using 20 market cap. and 16 ESG-screened benchmarks. The red line depicts quarterly average active shares for active non-ESG funds ( $N=4,072$ ). The blue line depicts the quarterly average active shares for active ESG-oriented funds ( $N=111$ ).



(a) 7 ESG-screened indexes from 2011



(b) 9 ESG-screened indexes from 2016

Figure 10: The figure displays the distribution of average active shares of 20 market capitalization indexes relative to ESG-screened indexes. Fig. (a) shows the averages for 7 ESG-screened indexes with holdings from 2011. Fig. (b) shows the averages for 9 ESG-screened indexes with holdings from 2016.

Table 12: Decrease in Active Management of ESG-oriented Funds: No Funds Emerged after 2015

	Active Share		Active Share ESG		Activeness P2020		Turnover	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ESG Fund*Post2015	-0.014 (-0.788)		-0.023 (-1.248)		-3.173 (-0.616)		0.065* (1.907)	
Post2015	-0.005** (-2.047)		-0.015*** (-8.95)		0.733 (0.729)		0.011 (1.567)	
ESG Fund*Post2018		-0.037* (-1.696)		-0.041* (-1.818)		-2.103 (-0.426)		0.067* (1.665)
Post2018		-0.039*** (-9.901)		-0.049*** (-14.491)		-0.771 (-0.492)		-0.009 (-0.755)
ESG Fund	0.036** (2.027)	0.042** (2.433)	-0.018 (-1.043)	-0.016 (-0.953)	-4.092 (-0.599)	-5.433 (-0.963)	-0.144*** (-3.586)	-0.127*** (-3.386)
logTNA <sub>t-1</sub>	-0.013*** (-9.583)	-0.013*** (-9.573)	-0.009*** (-8.454)	-0.009*** (-8.446)	-1.626*** (-3.889)	-1.627*** (-3.891)	0.003 (0.729)	0.003 (0.729)
logAge <sub>t-1</sub>	0.001 (0.341)	0.001 (0.325)	-0.004 (-1.069)	-0.004 (-1.088)	-7.058*** (-5.534)	-7.059*** (-5.533)	-0.052*** (-4.649)	-0.052*** (-4.643)
Flows <sub>t-1</sub>	0.008 (0.422)	0.008 (0.45)	0.029** (2)	0.029** (2.036)	15.900* (1.949)	15.92* (1.951)	0.079 (1.377)	0.078 (1.365)
4F Alpha <sub>t-1</sub>	-0.858* (-1.66)	-0.846 (-1.636)	-1.820*** (-4.454)	-1.81*** (-4.425)	-604.3*** (-2.698)	-604.4*** (-2.699)	-9.803*** (-5.987)	-9.811*** (-5.992)
Return Volatility <sub>t-1</sub>	0.46*** (2.795)	0.459*** (2.791)	0.937*** (6.903)	0.936*** (6.903)	300.4*** (5.589)	300.5*** (5.591)	2.396*** (5.51)	2.396*** (5.509)
Expense Ratio <sub>t-1</sub>	6.082*** (13.611)	6.078*** (13.603)	3.52*** (10.108)	3.517*** (10.101)	4642.9*** (33.031)	4643*** (33.032)	44.57*** (43.543)	44.57*** (43.55)
Adj. R <sup>2</sup>	0.395	0.395	0.497	0.497	0.373	0.373	0.307	0.307
FE	Obj,Year	Obj,Year	Obj,Year	Obj,Year	Obj,Year	Obj,Year	Obj,Year	Obj,Year
Obs.	78,546	78,546	78,546	78,546	78,546	78,546	78,546	78,546

This table reports the estimated decrease in active management among ESG-oriented mutual funds after December 2015 (December 2018). The sample consists only of funds with first offer date before December 2015. Columns (1)-(3) use *Active Share* calculated following the methodology of Cremers and Petajisto (2009) as the dependent variable. Columns (4)-(6) use *Active Share ESG*, which incorporates ESG-screened benchmarks into calculation of *Active Share*. Columns (7)-(9) employ the activeness measure developed by Pástor et al. (2020) as the dependent variable. In columns (10)-(12), the dependent variable is portfolio turnover ratio. Standard errors are clustered at the fund level. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels, respectively. *t*-statistics are reported in parentheses.