

Active Management and Sustainability Performance of US Mutual Funds

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Abstract

This paper investigates the role of active management in the sustainability performance of U.S. equity mutual funds. Despite the rise of passive investment strategies, actively managed funds continue to account for the majority of assets in the mutual fund industry. Using a sample of 2,860 mutual funds and a comprehensive set of sustainability measures, including compliance violations, CO2 emissions and emissions intensity, ESG scores, and reputational risk, we document that greater active management, measured as deviation from market indexes, is associated with improved portfolio-level sustainability. A one-standard-deviation increase in active management corresponds to a 6% reduction in overall and environmental violations as well as a 13% decrease in labor and consumer violations. Actively managed funds also show 3.6% lower Scope 1 CO2 emissions and a 12% lower Scope 1 emissions intensity. In addition, these funds tend to hold firms with higher environmental scores and lower reputational risk. Our results are robust to a range of alternative specifications, including categorical definition of active management, incorporation of ESG-screened market indexes, and sensitivity tests that account for missing data and disclosure bias. Furthermore, although we find no evidence that actively managed funds are able to align ESG performance with financial returns, or that more sustainable portfolios attract greater investor flows. We find a positive association between stronger sustainability outcomes and higher management fees, indicating that managers may use portfolio sustainability outcomes to signal their active stock-selection skill. Overall, our findings suggest that the value of active management may lie in its ability to identify and invest in firms with superior sustainability performance, compared to passive strategies that replicate the market portfolio.

Keywords: ESG · Mutual funds · Active management · Responsible investing · Violation tracker · ESG ratings

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1 Introduction

Sustainable investing has been in the spotlight for both practitioners and academic researchers. Among the most widely discussed tools in this domain are ESG-oriented funds, which have seen remarkable growth in recent years.¹ In the U.S. alone, ESG funds managed nearly \$150 billion in assets by 2022—nine times the amount in 2012. However, this rapid expansion has not been without controversy. Critics argue that many ESG-oriented funds lack diligence in selecting stocks that truly contribute to a more sustainable world. Their critique is supported by anecdotal evidence. For instance, a combined \$1.4 billion exposure to companies linked to forced labor camps in China was revealed for ESG-oriented funds.² JP Morgan’s ESG labeled funds invested over £200 million in a mining company criticized for environmental violations in South Africa.³ BlackRock, one of the world’s largest asset managers, faces allegations of contributing to deforestation and human rights violations through its investments in agribusinesses.⁴

Academic work also documents records of greenwashing by ESG-labeled mutual funds. Gibson Brandon et al. (2022) find that US-based signatories of the Principles for Responsible Investment do not demonstrate superior portfolio sustainability. Raghunandan and Rajgopal (2022) show that while ESG-oriented funds tend to hold stocks with higher ESG scores, they frequently invest in companies with worse labor and environmental compliance records. Additionally, Abouarab et al. (2024) find that the carbon footprints of environmental funds do not improve following announcements of ESG integration into their investment processes. One possible explanation is that ESG-related information is often complex and inconsistent (Berg et al., 2021, 2022; Christensen et al., 2018), which may require fund managers to have strong stock-selection skills to identify firms with genuinely sustainable practices and to more actively deviate from passive investment strategies. This implies that a higher degree of active management may enhance a fund’s sustainability performance, as more diligent stock selection could lead to outperformance in terms of sustainability. Examining ESG investment skill, Ceccarelli et al. (2023) find that proactive mutual fund managers tend to hold firms that the market eventually recognizes as sustainable, rather than frequently trading based on ESG rating changes.

On the other hand, active management may lead to poorer sustainability performance if active deviations from the market move in the opposite direction of ESG considerations. When the market substantially incorporates ESG criteria, moving away from it will imply reduced alignment with sustainable investing. Unlike passive strategies, which are inherently constrained by index

¹For example, the Investment Company Institute reported a continued increase in the number of U.S. ESG mutual funds and ETFs, rising from 484 in 2019 to 913 in 2023: Investment Company Institute, *Investment Company Fact Book*, 2024 – [ICI](#).

²Chloe Leung, *ESG funds Found to Have \$1.4bn Exposure to Xinjiang Labour Camps*, The Financial Times, December 26, 2024 - [The Financial Times](#).

³Josephine Moulds, Stefano Valentino, Giorgio Michalopoulos & Julia Evans, *JP Morgan’s Sustainable Funds Hold Stake in Mining Giant Glencore*, The Guardian, March 1, 2025 - [The Guardian](#).

⁴Jonathan Watts, *BlackRock Accused of Contributing to Climate and Human Rights Abuses*, The Guardian, November 20, 2024 - [The Guardian](#).

composition, active managers are less bound by market index inclusions and have greater flexibility to diverge, without accounting for prevailing market trends. As a result, this flexibility of active funds does not necessarily translate into improved ESG outcomes, particularly in the absence of a clear ESG mandate or strong incentives to prioritize sustainable investments. Consequently, active management may be associated with weaker portfolio-level sustainability.

In this paper, we aim to examine whether more active stock selection, as measured by the level of active management of a fund, is associated with improvements or deteriorations in portfolio sustainability performance. We incorporate approach of Cremers and Petajisto (2009) and utilize CRSP Survivor-Bias-Free US Mutual Funds Database to measure stock-picking or level of active management. This measure compares a fund’s holdings to market index positions, indicating the extent to which its portfolio deviates from well-known market benchmarks.

To assess the impact of active strategies on a fund’s sustainability performance, we employ a wide range of sustainability indicators. First, we use Violation Tracker data on penalties for labor, environmental, and consumer-related offences to measure fund exposure to violations committed by companies the fund holds. Second, we analyze CO2 emissions and emissions intensity data from LSEG to evaluate the carbon footprint of portfolio companies. Third, we use LSEG’s ESG scores to measure portfolio-level sustainability as determined by a third-party ESG performance assessor. Finally, we incorporate RepRisk data to evaluate reputational risk based on negative incidents linked to portfolio companies. Combining these datasets with CRSP mutual fund holdings yields 16,554 fund-year observations spanning 11 years between 2011 and 2022.

A common challenge in evaluating fund performance is the inherent heterogeneity in investment strategies across funds. To address this, we restrict our analysis to funds within the same advisor company and include advisor-year fixed effects, following (Abis and Lines, 2024; Raghunandan and Rajgopal, 2022). This approach enables us to compare less actively managed funds with more actively managed ones within the same advisor firm and year, controlling for heterogeneity arising from differences in financial institutions’ investment approaches. Additionally, we control for the average size of portfolio firms to account for funds targeting large-asset versus smaller firms, as well as the dependence of firm sustainability outcomes on firm size (Aswani et al., 2024).

Our main finding is that higher levels of active management are generally associated with better sustainability outcomes. Actively managed funds exhibit lower incidences across all violation types, reduced penalty amounts, decreased CO2 emissions and emissions intensity for all scopes, and lower reputational risks among their portfolio companies. These effects are economically meaningful: a one-standard-deviation increase in active management corresponds to a 6% reduction in any violation, a 13% decrease in labor violations, a 6.1% decrease in environmental violations, and a 13.3% reduction in consumer violations. Additionally, increased active management is linked to a 4.5% reduction in total penalty amounts, an 11% lower labor violation fines, a 15% reduction in environmental violation penalties, and a 10.7% lower consumer-related fines. Regarding environmental performance, the same increase in deviation from market benchmarks is associated with a 3.6%

reduction in log Scope 1 unscaled CO2 emissions, a 1.4% decrease in log Scope 2, and a 2.5% decline in log Scope 3. Emissions intensity is also positively associated with active management, showing corresponding reductions of 12% for Scope 1, 3% for Scope 2, and 7% for Scope 3.

Interestingly, we find that the effect of active management is not homogeneous across ESG-oriented and non-ESG funds managed by the same advisor. Our results show that an increase in active management within ESG-oriented funds is associated with a higher incidence of compliance violations and higher carbon emissions, compared to this effect for their non-ESG counterparts under the same management. The poorer sustainability performance among firms held by highly active ESG funds may indicate the presence of activist investors who intentionally invest in underperforming firms with the aim of engaging and driving improvements in their sustainability practices.

Our findings remain robust across a range of alternative specifications. First, we use a discrete rather than continuous measure of active management to account for the concentration at the upper end of the active management distribution. The results hold: highly actively managed funds are associated with stronger sustainability outcomes, while passive funds exhibit poorer performance compared to moderately active funds. Moreover, we estimate active management relative to a broader set of market benchmarks, including ESG-screened indexes, to account for passive ESG investment strategies. The results remain consistent. Higher levels of activeness are associated with fewer violations, lower penalty amounts, reduced CO2 emissions and emissions intensity, and lower reputational risks. Third, we use the portfolio turnover ratio as an alternative proxy for active management. Portfolio turnover captures a different dimension of active management, namely, trading frequency (Pástor et al., 2020). However, unlike active share, it does not account for the direction of trades, making it difficult to determine whether improved sustainability outcomes stem from deviations from the market portfolio, that is, from stock selection and active bets by fund management. For this reason, active share remains our primary measure of active management. Nonetheless, we show that turnover ratio is positively associated with less favorable sustainability outcomes, including higher penalty amounts and increased CO2 emissions and their intensity. We test the sensitivity of our findings to firm-level disclosure limitations, addressing the concern that more active funds may disproportionately invest in smaller-cap firms with limited sustainability data. Under alternative assumptions for handling undisclosed or missing firm-level sustainability data, our main results remain robust.

Further, we investigate potential incentives for active managers to improve portfolio-level sustainability. First, we examine whether active management moderates the relationship between sustainability and financial performance. Specifically, we hypothesize that active managers may use ESG criteria to enhance a fund's financial performance, which could, in turn, explain the stronger sustainability performance observed in actively managed portfolios. However, our findings provide no evidence that actively managed funds consistently align sustainability with financial performance. Next, we examine investor flows as a potential incentive for funds to hold more sustainable firms. If mutual fund investors value sustainability, they may reward funds with stronger ESG performance by

allocating greater capital inflows. However, our analysis reveals no significant relationship between a fund’s realized sustainability performance and subsequent investor inflows. Although some of the adverse effects, when poorer portfolio sustainability was associated with greater investor inflows, were partially mitigated after 2016, this shift was insufficient to create a strong and consistent link between better sustainability performance and capital inflows. Instead, we find that ESG-labeled funds, those with ESG-related terms in their names or prospectuses, attracted significantly higher flows post-2016. This suggests that investors may rely more on marketing signals than on the actual sustainability of fund holdings. Third, we investigate management fees as a potential incentive mechanism. If active managers can leverage strong sustainability outcomes as a credible signal of their stock-selection skill, they may justify charging higher fees. This creates an incentive to demonstrate better sustainability performance, even in the absence of an explicit ESG orientation. We find that a higher incidence of violations, greater violation penalties, and increased Scope 1 and 3 CO₂ emissions intensity within fund portfolios are associated with lower management fees. While the weak link between realized sustainability outcomes and fund flows may reflect an adverse selection problem, where outside investors struggle to assess managerial skill, self-assessed superior stock-selection ability reflected in higher management fees, does correlate with more diligent portfolio construction.

The paper contributes to several strands of research in finance and economics. First, it adds to the literature on mutual fund active management. Prior studies have explored various determinants of fund activeness, including fund size, age, and investor flows (Gruber, 1996; Cremers and Petajisto, 2009; Pástor et al., 2015); managers’ investment skill and the benefits of portfolio concentration (Kacperczyk et al., 2005; Kacperczyk et al., 2016; Cremers and Pareek, 2016; Champagne et al., 2018; Lantushenko and Nelling, 2021); as well as the role of structural characteristics of mutual funds, such as team management (Dass et al., 2013) and the presence of institutional share classes (Evans and Fahlenbrach, 2012). Regarding the consequences of active management, the prevailing evidence suggests that active strategies rarely outperform passive ones in terms of financial returns (Chevalier and Ellison, 1997; Baks et al., 2001; Fama and French, 2010; Berk and Van Binsbergen, 2015; Cremers et al., 2019). Our paper offers a different perspective on the value of active management by focusing on sustainability outcomes, rather than the financial performance of actively managed portfolios, a dimension that has not yet been explored in relation to active management.

Second, this paper contributes to the expanding literature on sustainable investing in mutual funds. Prior research has examined investor interest in sustainability, generally finding that ESG labels and ESG-oriented investment strategies can attract capital (Hartzmark and Sussman, 2019; Van der Beck, 2021; Baker et al., 2022; Cocharde et al., 2023). However, this effect tends to weaken when uncertainty about sustainable investing outcomes increases or when such strategies fail to align with strong financial performance (Pedersen et al., 2021; Gantchev et al., 2024; Agoraki et al., 2025). Additionally, the literature has examined the investment behavior of ESG-oriented funds by analyzing their portfolio compositions (Raghunandan and Rajgopal, 2022; Orlov et al., 2022; Ceccarelli et al., 2023; Cremers et al., 2023), with most studies finding that many ESG-labeled

funds fall short of fulfilling their stated sustainability objectives. Our paper extends this literature by providing evidence on the sustainability outcomes of actively managed mutual funds.

The remainder of the paper is organized as follows. Section 2 describes our data sources and the sample selection process. Next, Section 3 outlines the empirical methodology, describes the construction of key variables, and presents summary statistics for the sample. Section 4 presents our main findings. Section 5 assesses the robustness of these results. In Section 6, we investigate potential motives behind our main findings. Finally, Section 7 concludes.

2 Data

2.1 Mutual Funds data

We obtain data on mutual funds from the CRSP Survivor-Bias-Free US Mutual Funds Database. The sample period spans from 2011 to 2022. Although CRSP provides holdings data for most funds beginning in 2010, after applying the data cleaning procedures described below, 2011 is the first year in which holdings are consistently available across our sample. Therefore, we begin our analysis in 2011. Fund information and fund holdings are available on a quarterly basis.

To focus on equity funds, we exclude non-equity funds and retain only those with more than 75% of assets invested in common equity. We consolidate fund information across share classes at the portfolio level: total net assets are computed as the sum of share-class-level TNA, while other fund-level characteristics such as the percentage of shares available to retail investors, fund flows, annual returns, and annual return volatility are calculated as asset-weighted averages of share-class-level data. Following a common approach in the literature (Chevalier and Ellison, 1997; Cremers et al., 2023; Gantchev et al., 2024), we exclude small funds with less than \$20 million in TNA to mitigate incubation bias (Evans, 2010), as well as funds with fewer than 10 holdings or more than 20% of TNA allocated to a single holding to ensure that the funds' portfolios are well diversified. Additionally, we require funds to have available information on the industry composition of portfolio holdings and returns data.

We identify ESG-oriented funds based on keywords.⁵ A fund is classified as ESG-oriented fund if its name contains at least one of the keywords. We then verify this classification by reviewing the fund's investment objectives and strategies as disclosed in its prospectus, ensuring the presence of sustainability-related investment practices. Using this approach, we identify 309 sustainable mutual funds. Next, we review the sample for name changes. Among the identified ESG funds, 64 funds have changed their names to include a sustainable keyword during the sample period. We exclude these funds from the analysis to mitigate potential greenwashing concerns associated with them

⁵We use the following keywords for the 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).

(Cochardt et al., 2023). As a result, the number of ESG-oriented mutual funds decreases to 245. Of these, 28 funds were not matched with CRSP portfolio holdings, further reducing the sample to 217 sustainable funds. Since this paper incorporates advisor-by-year fixed effects, we remove ESG-oriented funds that lack a conventional counterpart under the same advisor company in a given year. A total of 37 ESG mutual funds did not have a non-ESG counterpart, leading to a final sample of 180 ESG-oriented mutual funds paired with 2,680 conventional funds managed by 73 different advisor institutions. The sample of identified sustainable funds is somewhat larger than that of Raghunandan and Rajgopal (2022). However, their sample period ends in 2018, whereas the growing attention to sustainable investing has led to the inception of a large number of ESG-oriented mutual funds in recent years. The number of ESG-oriented funds by year is presented in Table 19 in the appendix. The final sample comprises 16,554 fund-year observations.

2.2 Benchmarks data

To measure the level of active management of a mutual fund, we adopt the approach of Cremers and Petajisto (2009). Specifically, we benchmark each fund’s portfolio against 20 market capitalization indexes to assess the extent to which its holdings align with the constituents of widely used market benchmarks. A detailed description of the activeness measure’s construction is provided in Section 3.1. We use the 20 most common market capitalization indexes, following (Cremers and Petajisto, 2009; Cremers et al., 2023). The selected indexes are the following: 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 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 commonly used equity indexes and include companies with the largest market capitalizations. As such, they serve as appropriate benchmarks for assessing a fund’s activeness relative to mainstream market securities. The selection of the benchmark set is critical for accurately estimating active management using the *Active Share* measure. In Section 5.1.1, we examine an expanded set of benchmarks, including those with explicit ESG criteria. Data on benchmark constituents is obtained from CRSP-reported holdings of index funds or benchmark-tracking ETFs. We require the benchmark data to be available for the same time period as our holdings data.

2.3 Violations

To evaluate the sustainability performance of funds, we utilize data on compliance violations committed by companies within mutual fund portfolios. The construction of portfolio-level sustainability measures based on violation data is described in Section 3.2. The data is obtained from the Violation Tracker database, provided by the non-profit organization Good Jobs First. This database

tracks penalties imposed on companies for violations of federal laws in the US (Violation Tracker dataset) and across 52 countries globally (Violation Tracker Global dataset), covering 428,864 public and private companies and fines exceeding 5,000 US dollars. All penalties issued worldwide are converted to US dollars. The highest number of violations in the global dataset originates from the United Kingdom, with the Environment Agency and the Employment Tribunal being the most frequent penalizing agencies. In the US, violations are most commonly related to workplace safety and are primarily enforced by the Occupational Safety & Health Administration. Violation Tracker provides the date of each penalty announcement. We aggregate violations to an annual level, using the year in which the penalty was announced.

Following Raghunandan and Rajgopal (2022), we categorize violations into three main types based on the agency issuing the penalty: consumer violations, labor violations, and environmental violations. Consumer violations include penalties for competition-related and consumer protection offences, as identified by Violation Tracker. Labor violations encompass fines related to employment and workplace safety regulations. Environmental violations correspond to offences classified under the environment-related offence group. All other violations, including financial offences, healthcare-related offences, government-contracting-related offences, and miscellaneous offences, are grouped into a separate category labeled "other" violations. Examples of offences by type are presented in Table 20 in the appendix. The yearly occurrence of violations by type, along with cumulative penalty amounts, is reported in Table 21 in the appendix. Labor violations account for the largest share, with approximately 20,000 companies identified as violators each year, while consumer-related violations represent the smallest proportion, with no more than 1,593 companies violating consumer-protection or competition regulations annually.

We match violation data with companies in mutual fund portfolios using a two-step process: first we match by parent company ISIN numbers and then by parent company names to enhance the coverage of compliance violation data. Subsequently, we manually verify the accuracy of matches between ISINs and company names in the Violation Tracker dataset and those in the CRSP mutual fund holdings data. The number of matched companies by year is reported in Table 22 in the appendix.

2.4 Emissions

To give a more detailed assessment of sustainability performance and environmental performance in particular, we incorporate data on companies' CO2 emissions. CO2 emissions are widely used as an objective measure of firms' environmental performance (Flammer, 2021, Raghunandan and Rajgopal, 2022, Bolton and Kacperczyk, 2023, Bolton and Kacperczyk, 2024). We obtain data on Scope 1, Scope 2, and Scope 3 CO2 emissions from LSEG Workspace (formerly Eikon/Refinitiv). LSEG collects and standardizes self-reported emissions based on publicly available sources, including annual reports, NGO websites, and sustainability disclosures. The dataset covers 138,890 public and private companies worldwide and is reported on an annual basis. In our analysis, we use CO2

emissions data across all three scopes. Scope 1 emissions refer to direct CO₂ and CO₂-equivalent emissions from sources owned or controlled by a company. Scope 2 refers to indirect emissions from consumed or purchased energy (e.g., electricity, heat, or steam) occurring at the facility level. Scope 3 includes emissions associated with contractor-owned vehicles, employee business travel, waste disposal, outsourced activities, product use by customers, and supply chain operations. Emissions intensity is the total emissions divided by a firm’s net sales as reported by LSEG.

Although widely used in previous studies, unscaled CO₂ emissions as a measure of environmental performance have recently been criticized for their strong correlation with firm size (Aswani et al., 2024). To address this concern, we additionally employ CO₂ emissions intensity, which normalizes total firm CO₂ emissions by firm size. Specifically, we use two scaling factors: total net assets and gross sales, both obtained from Compustat fundamentals. In our main specification, emissions intensity is calculated by dividing total CO₂ emissions by gross sales. As a robustness, we also scale emissions by firm total assets and report these results separately.

We merge the emissions data with the CRSP Mutual Funds Holdings database to construct a portfolio-level measure of funds’ environmental performance. The matching between LSEG emissions data and companies in the CRSP Mutual Funds Holdings database is presented in Table 22 in the appendix. The availability of emissions data varies across years, with only a small number of companies reporting Scope 3 of CO₂ emissions.

2.5 Third-Party Sustainability Ratings

In addition to compliance violations and CO₂ emissions, which serve as direct and objective indicators of firms’ social and environmental performance, we incorporate third-party sustainability assessments or sustainability ratings. Although such ratings have faced significant criticism as measures of firms’ actual sustainability performance (Berg et al., 2021, Larcker et al., 2022, Berg et al., 2022), they provide a useful contrast to more transparent metrics such as regulatory fines and CO₂ emissions. Specifically, we utilize data from two independent sustainability indicator providers: LSEG Workspace and RepRisk.

The LSEG Workspace provides annual company-level ESG scores (formerly Refinitiv/ASSET4 ESG scores), constructed using LSEG’s proprietary methodology, which evaluates firms’ ESG performance on a scale from 0 (low performance) to 100 (high performance) based on publicly available and auditable data. We employ both the aggregate ESG score and the individual scores for the Environmental, Social, and Governance pillars. The coverage of LSEG ESG scores for firms within mutual fund portfolios is reported in Table 22 in the appendix.

RepRisk collects data on ESG-related incidents reported in the media and assesses firms’ reputational risk based on the novelty, severity, and geographical reach of these incidents. Specifically, we use the RepRisk Index (RRI), which quantifies firms’ reputational risk on a scale from 0 (low risk) to 100 (high risk). Incorporating RepRisk data allows for the evaluation of an additional dimension

of sustainability concerns that may influence investor decisions, namely, firms’ reputational risk. As discussed in Albuquerque et al. (2019), reputation plays a crucial role in firm risk and value, as strong corporate social responsibility (CSR) practices can mitigate consumer backlash in response to negative ESG events. The RepRisk dataset is available for the period from 2012 to 2021. The number of firms covered each year is presented in Table 22 in the appendix.

2.6 Control Variables

We incorporate a range of fund-level control variables obtained from CRSP and Compustat. To account for economies of scale in fund management, we include the logarithm of fund total net assets and the logarithm of fund age. Additionally, we control for governance structure by incorporating the percentage of fund shares available to retail investors. This variable reflects the extent to which a fund is oriented toward retail rather than institutional clientele, with a larger presence of the latter generally associated with greater external monitoring over fund management (Evans and Fahlenbrach, 2012). We also control for annual buy-and-hold returns and annual return volatility to account for fund financial performance. Additionally, we account for the industry composition of a fund portfolio. Specifically, we include the percentage of sin stocks in the fund portfolio, following the approach in Hong and Kacperczyk (2009). We also include the percentage of technology stocks, as defined by Heckler (2005). Finally, we control for the percentage of oil, gas, and coal stocks, identified based on two-digit SIC codes. To account for firm size of portfolio firms at the fund level, we compute value-weighted averages of firm-level total net assets and gross sales, resulting in a portfolio-level firm size measure for each fund-year. These controls address the documented correlation between firm size and firm-level sustainability metrics. For instance, larger firms may emit more in absolute terms due to scale, not necessarily due to poor environmental performance. In addition to controlling for firm size, the portfolio-level firm size measures allow us to capture differences in investment strategies across mutual funds. Specifically, they allow us to account for the fact that some funds invest in large or value firms, while others may focus on growth-oriented firms that emphasize revenue-based metrics.

3 Variables Construction and Methodology

3.1 Active Share

The objective of this paper is to evaluate the relationship between the active management of mutual funds and their sustainability performance. To this end, it is essential to define active management. The active management of a fund portfolio is a multidimensional concept (Pástor et al., 2020). First, active management can be defined through active trading, where a more active fund is the one that engages in trades more frequently. Alternatively, active management can be viewed as a deviation from a passive strategy, capturing the fund’s active decisions to invest in

non-mainstream stocks. In this latter case, the focus is on the fund management’s stock-selection skills, specifically, whether the fund manager is able to select stocks that outperform a market index or a passive strategy. Since the aim of our paper is to investigate whether active management can enhance sustainability performance through more diligent evaluation of firm-level sustainability, we consider the stock-picking dimension to be a central focus of our analysis.⁶

To measure the stock-picking dimension of active management, we use the *Active Share* measure, developed by Cremers and Petajisto (2009). The *Active Share* is defined as:

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

where $w_{f,i,t}$ corresponds to the fund f weight in security i at time t , and $w_{b,i,t}$ represents the weight of the benchmark in the same security and time period. The summation is performed over all stocks N held in both the fund’s and benchmark’s portfolios. 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).

We calculate *Active Share* for each fund relative to the 20 market capitalization indexes outlined in Section 2.2. The lowest *Active Share* value across these benchmarks is used as the fund’s active management measure for a given period to capture the closest empirically identified passive portfolio for a fund. Since portfolio holdings data are available quarterly, we compute *Active Share* for each quarter and define a fund’s annual activeness as the average *Active Share* over the four quarters of the year. By measuring active management of mutual funds, we aim to investigate whether more actively managed funds exhibit stronger or worse sustainability performance compared to more passive counterparts.

3.2 Indicators of Portfolios’ Sustainability Performance

To evaluate the sustainability performance of mutual funds, we incorporate a comprehensive set of firm-level sustainability indicators, including penalties for compliance violations, CO2 emissions, emissions intensity, ESG scores and reputational risks. For compliance violations, we construct both an indicator variable, which equals one if a company has been penalized for a violation, and a continuous variable representing the dollar amount of penalties. We aggregate these firm-level measures to the portfolio level by constructing a value-weighted fund-level measure for each firm-

⁶In Section 5.1.2, we explore another dimension of active management, namely, trade frequency, as captured by the portfolio turnover ratio.

level sustainability indicator. The portfolio-level sustainability measures are computed as follows:

$$SustainabilityIndicator_{f,t} = \frac{\sum_n^N MarketValue_{i,t} \times FirmSustainability_{i,t}}{AdjustedTNA_{f,t}} \quad (2)$$

where $MarketValue_{i,t}$ represents the market value of fund f 's holdings in firm i with a non-missing firm-level sustainability indicator at year t . $AdjustedTNA_{f,t}$ denotes the total net assets of fund f invested in all firms with available sustainability data at year t or TNA adjusted for missing information. $FirmSustainability_{i,t}$ corresponds to one of the firm-level sustainability indicators (e.g. the dollar amount of violations, the presence of a violation, or Scope 1 CO2 emissions). Importantly, we exclude firms that have never appeared in the Violation Tracker database when constructing violation-related variables, firms not covered by the LSEG database when calculating emissions and ESG scores variables, and firms not covered by RepRisk when assessing fund-level reputational risk.

When handling the Violation Tracker database, it is crucial to differentiate between missing values and the absence of violations. Following the approach in Raghunandan and Rajgopal (2022), we assume that if a company has appeared at least once in the Violation Tracker database, it is covered by the dataset. Consequently, for years in which a covered company is not reported as having committed a violation, we assign a penalty amount of zero. Conversely, firms that have never appeared in the Violation Tracker database are excluded from the computations, as their absence suggests that they are not covered by the dataset. This approach ensures a balanced dataset for firm-level violations. We examine an alternative assumption for handling unreported data in Section 5.2. Specifically, we assume that all firms are covered by the database, given that Violation Tracker monitors penalizing agencies rather than firms themselves. Consequently, we assign a penalty amount of zero to firms without penalties. Our results remain robust to this adjustment.

We present descriptive statistics for all fund-level variables in Table 1. Similar to unscaled CO2 emissions, scaled emissions or emissions intensity exhibit considerable skewness in the distribution. To address this issue, we apply a log transformation to emissions intensity, even though this approach is relatively uncommon in the existing literature.⁷ The correlations between our main variables are reported in Table 23 in the appendix. As expected, fund-level firm size variables are strongly correlated with sustainability measures, underscoring the importance of controlling for size when estimating sustainability outcomes. Active management is negatively correlated with fund total net assets, suggesting that larger funds tend to be less actively managed.

⁷While log-transforming emissions intensity is not standard practice, log transformations are often used for other financial ratios that remain skewed even after scaling. For instance, studies of cash holdings frequently apply a log transformation to the cash-to-assets ratio to correct for skewness (Opler et al., 1999).

Table 1: Summary Statistics

Variable	Q1	Median	Mean	Q3	Sd.	N
Active Share	0.598	0.801	0.715	0.932	0.279	16,554
Any violation (indicator)	0.434	0.63	0.582	0.744	0.209	16,554
Environmental violation (indicator)	0.094	0.191	0.209	0.29	0.157	16,554
Labor violation (indicator)	0.281	0.414	0.401	0.53	0.183	16,554
Consumer violation (indicator)	0.063	0.23	0.24	0.389	0.183	16,554
Other violation (indicator)	0.031	0.103	0.128	0.198	0.12	16,554
Any violation (log amount)	14.7	17.35	16.5	18.98	3.39	16,554
Environmental violation (log amount)	9.927	12.47	11.47	14.42	4.339	16,554
Labor violation (log amount)	11.74	14.05	13.2	15.55	3.615	16,554
Consumer violation (log amount)	13.01	16.08	14.55	18.17	5.204	16,554
Other violation (log amount)	11.62	15	13.31	17.59	5.783	16,554
log CO2 Scope 1	12.66	14.15	13.83	15.24	1.895	16,267
log CO2 Scope 2	12.54	13.59	13.28	14.22	1.189	16,268
log CO2 Scope 3	14.44	16	15.45	16.86	1.99	15,962
log Emissions Intensity (Emissions to Sales) Scope 1	3.035	4.612	4.216	5.429	1.787	15,958
log Emissions Intensity (Emissions to Sales) Scope 2	2.965	3.460	3.459	3.964	0.840	15,996
log Emissions Intensity (Emissions to Sales) Scope 3	4.678	5.719	5.447	6.412	1.548	15,835
ESG Score	46.92	59.18	56.82	67.6	12.94	16,508
E Score	37.5	54.85	50.7	65.52	18.47	16,508
S Score	49.29	61.81	59.78	71.26	13.74	16,508
G Score	52.67	60.8	58.67	65.94	9.921	16,508
RepRisk Index	11.44	22.35	21.02	29.93	10.23	12,928
% of fund shares available to retail investors	0	0	0.234	0.452	0.368	16,554
% sin stocks	0	0.006	0.016	0.02	0.035	16,554
% oil, gas, coal stocks	0	0.013	0.035	0.034	0.096	16,554
% technology stocks	0.116	0.213	0.217	0.274	0.172	16,554
log Fund Age	2.079	2.639	2.476	3.045	0.804	16,554
log Fund TNA	5.082	6.34	6.383	7.524	1.749	16,554
log weighted-average firm TNA	9.391	10.908	10.511	11.791	1.493	16,529
log weighted-average firm Sales	8.766	10.187	9.870	11.086	1.436	16,529
Annual buy-and-hold returns	-0.044	0.108	0.092	0.236	0.187	16,554
Annual return volatility	0.008	0.01	0.012	0.015	0.006	16,554

This table presents summary statistics for fund-year variables used in the analysis. Definitions of all variables are provided in the Appendix. *logTNA*, *annual buy-and-hold returns*, *annual return volatility*, *log firm TNA*, *log firm sales*, *log amount of any violations*, *log amount of environmental violations*, *log amount of labor violations*, *log amount of consumer violations*, *log amount of other violations*, *log emissions*, *log emissions to sales* are winsorized at the 1% and 99% levels.

3.3 Estimation Strategy

One of the key challenges in evaluating the sustainability outcomes of mutual funds is that portfolio outcomes may be influenced by heterogeneity in investment strategies across funds. Following prior literature (Raghunandan and Rajgopal, 2022; Abis and Lines, 2024), we address this issue by restricting the analysis to funds managed by the same financial institution and including advisor-year fixed effects. The inclusion of advisor-year fixed effects enables comparisons between funds managed by the same advisory firm, thereby controlling for differences in investment strategies across asset managers.⁸

⁸For instance, Gaspar et al. (2006) find that mutual funds within the same managing advisor strategically allocate performance across member funds to benefit those more likely to enhance overall profitability. Ibert et al. (2018)

We examine how the active management of a fund relates to the fund-level sustainability outcomes by estimating the following regressions:

$$PortfolioSustainability_{f,j,t} = \beta_1 * ActiveShare_{f,t} + \beta_2 * Controls_{f,t} + \lambda_{jt} + \epsilon_{f,j,t} \quad (3)$$

where f, j, t denote fund, advisor, and year, respectively. $PortfolioSustainability_{f,j,t}$ represents various fund-level sustainability measures, including portfolio-average penalties for environmental, labor, and consumer violations, as well as CO2 emissions, emissions intensity, ESG scores and reputational risks. The main independent variable of interest is $ActiveShare_{f,t}$, which measures the degree of active management by comparing a fund’s holdings to those of market indexes. In subsequent specifications, we include an interaction term between the fund’s ESG-orientation indicator, $ESGfund_{f,t}$, and $ActiveShare_{f,t}$ to capture potential differences in how active management relates to sustainability outcomes for ESG versus non-ESG funds managed by the same advisor. We expect that, for ESG-oriented funds, greater active management will lead to higher portfolio sustainability performance, as these funds should be specifically intended to prioritize investments in sustainable stocks. The vector of fund-level control variables, $Controls_{f,t}$, includes the logarithm of fund total net assets (log TNA), the logarithm of fund age, the percentage of fund shares available to retail investors, the percentage of sin stocks in the fund portfolio, the percentage of technology stocks, the percentage of oil, gas, and coal stocks, annual buy-and-hold returns, annual return volatility, and the logarithm of the value-weighted average of portfolio firms’ total net assets or gross sales. Advisor-year fixed effects are captured by $\lambda_{j,t}$.

4 Results

4.1 Active Management

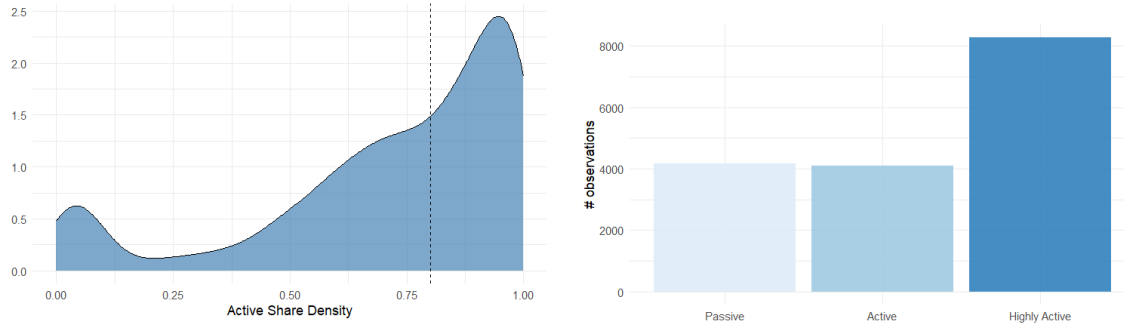
The full sample, although composed of both active and passive funds, exhibits relatively high levels of active management, with a sample mean value of 0.72 and a median of 0.80 (Table 1). Figure 1a displays the density distribution of *Active Share*. The distribution is right-skewed, with a notable concentration of observations near the upper bound of 1, indicating that a substantial share of funds deviate significantly from market capitalization benchmarks.⁹ According to Cremers and Petajisto (2009), funds with an *Active Share* below 0.6 are classified as having low active management. Based on this threshold, over half of the fund-year observations in the sample can be considered actively or highly actively managed. This aligns with the broader trend of a substantial portion of mutual fund assets continuing to be actively managed, amid the recent surge in passive

highlight the influence of fund family revenues and profits on manager compensation.

⁹This distribution of the *Active Share* measure is common in the empirical literature; see, for example, (Champagne et al., 2018), (Lantushenko and Nelling, 2021), and (Cremers et al., 2022).

investing.¹⁰ Despite the concentration near the upper bound, there is also a notable cluster of observations near the lower bound, indicating the presence of near-index funds in the sample.

Panel 1b illustrates the distribution of fund-year observations across active management categories: passive (*Active Share* below 0.6), active (*Active Share* between 0.6 and 0.8), and highly active (*Active Share* above 0.8). The majority of observations fall into the highly active category. The substantial number of active fund observations reflects considerable heterogeneity in active management strategies across the sample. The descriptive evidence of concentrated yet heterogeneous active management underscores the importance of appropriately modeling variation in fund active management levels, which is crucial for identifying its robust relation to portfolio-level sustainability. In our analysis, we use both the continuous *Active Share* measure and a categorical variable that groups funds into groups of active management, thereby testing potential non-linear relationships.



(a) The figure shows the distribution of the Active Share variable for the sample. The density is estimated using a Gaussian kernel with a bandwidth adjustment factor of 1.5 to smooth the curve. A dashed vertical line indicates the sample median.

(b) The figure displays the number of fund-year observations across three categories of active management based on Active Share: passive (*Active Share* < 0.6), Active ($0.6 \leq \text{Active Share} < 0.8$), and Highly Active (*Active Share* ≥ 0.8).

Figure 1

4.2 ESG-funds and Portfolio Sustainability

Before turning to the main analysis on the relation of active management to portfolio sustainability, we first replicate the findings of Raghunandan and Rajgopal (2022), hereafter R&R (2022), to validate their results within our sample. The outcomes of this replication are presented in Tables 24-26 in the appendix.

Table 24 reports the estimated impact of being an ESG-oriented fund on portfolio-level compliance violations. Consistent with the R&R (2022)'s findings, we find that, on average, ESG-oriented funds exhibit a higher incidence of overall violations and labor-related violations within their portfolios compared to non-ESG funds managed by the same advisor in the same year. Similarly, ESG

¹⁰The Investment Company Institute reported that assets managed by index funds and ETFs grew by 29% between 2010 and 2023. However, as of the end of 2023, 52% of total net assets were still actively managed: Investment Company Institute, *Investment Company Fact Book*, 2024 – ICI.

funds tend to hold stocks associated with higher penalties for labor and environmental violations. However, in contrast to R&R (2022), we find no significant effect on consumer-related violations, whereas their results indicate that ESG funds hold companies with fewer consumer violations. We also control for firm size in our extended specifications. The firm-level size variable is consistently positive and highly statistically significant across all sustainability measures. Its inclusion substantially increases the R^2 values, indicating that firm size explains a considerable portion of the variation in firm sustainability performance. The significantly positive coefficients of ESG fund dummy for the incidence of violations remain robust and consistent, however, the ESG fund label becomes insignificant for the penalty amount once firm size is accounted for. Additionally, after controlling for firm size, the ESG fund dummy turns negative and statistically significant for both the incidence of consumer violations and the log of penalty amounts. This suggests that ESG-oriented funds tend to hold firms with fewer consumer-related violations compared to non-ESG funds under the same management, aligning with the findings of R&R (2022).

Table 25 presents the results for the sustainability measures based on CO2 emissions. Overall, the findings closely align with those of R&R (2022) in terms of both the direction and magnitude of the coefficients. We find that ESG funds tend to hold companies with higher levels of unscaled Scope 2 and Scope 3 CO2 emissions compared to non-ESG counterparts managed by the same advisor in the same year, as well as companies with higher Scope 3 emissions intensity (emissions to sales). However, the results weaken with the inclusion of firm size controls. After accounting for value-weighted firm TNA, the significance of the coefficients for unscaled Scope 2 and Scope 3 emissions decreases. In contrast, the results for emissions intensity remain robust, reinforcing the concern that unscaled CO2 emission estimates may be substantially driven by firm size.

Lastly, we examine the impact of the ESG fund label on the aggregated ESG scores of companies within a fund’s portfolio. Table 26 presents the results. R&R construct their portfolio-level ESG score measures using scores from two providers: KLD and Asset4. However, due to data availability constraints, we replicate the analysis using only Asset4 scores (formerly Refinitiv, now LSEG ESG scores) and RepRisk data. The findings are consistent with those of R&R, as ESG funds, on average, exhibit higher portfolio-level ESG scores than those of non-ESG funds managed by the same advisor in the same year. Moreover, the positive impact extends across all ESG pillars, with ESG funds holding portfolios that score higher on the environmental, social, and governance dimensions. These results remain robust to the inclusion of firm size controls, although the magnitude of the coefficients is somewhat reduced. We do not find a significant relationship between ESG fund label and portfolio-level reputational risk, as the ESG fund dummy remains insignificant both before and after controlling for firm size.

Therefore, the findings of R&R (2022) largely hold within our sample, reinforcing their conclusions over a broader time frame and demonstrating that the data used in the present study align closely with theirs. Moreover, we add control for firm size to test whether their results could be confounded by size effects. Our findings show that their original results remain robust to this control.

In the following sections, we introduce active management as an independent variable to examine its relationship with mutual fund sustainability performance and assess whether active management can help mitigate greenwashing concerns.

4.3 Portfolio Violations

To assess the role of active management in portfolio sustainability of mutual funds, we estimate equation 3. In all specifications, the key variable of interest is *Active Share*, which estimates a fund’s level of active management by comparing the portfolio’s security weights to those in market capitalization indexes. Table 2 reports the results for fund-level sustainability, measured using an aggregated indicator that captures the presence of a violating company in a fund’s portfolio, as well as the natural logarithm of the actual penalty amount. Across all measures, active management has a significantly negative coefficient, indicating that higher levels of active management are linked to a lower incidence of violations across all categories, as well as reduced penalty amounts. Specifically, a one-standard-deviation increase in active management corresponds to a 6% reduction in the presence of any type of violation, a 13% decrease in labor violations, a 6.1% reduction in environmental violations, and a 13.3% reduction in consumer-related violations.¹¹ Thus, deviation from the market portfolio is associated with fewer compliance violations, suggesting that active management helps avoid firms with regulatory infractions. Since information about such offences is publicly available through regulatory disclosures, this further indicates that active managers might be better equipped to incorporate and act on this information. Similarly, higher levels of active management are associated with lower penalty amounts, reinforcing the finding that actively managed funds are less exposed to portfolio firms’ misconduct. A one-standard-deviation increase in active management corresponds to a 4.5% reduction in total penalty amounts, an 11% reduction for labor violations penalties, a 15% decrease in environmental penalties, and a 10.7% reduction for consumer-related fines. Importantly, across all specifications, the control for firm size measured by the value-weighted average of portfolio firms’ total net assets is consistently positive and statistically significant. This result supports the argument that larger firms, due to their scale, tend to exhibit inherently worse sustainability performance. Controlling for firm size is therefore essential for obtaining robust estimates.

Next, we interact *Active Share* with the ESG fund indicator to investigate whether the relationship between active management and portfolio sustainability differs for explicitly ESG-oriented funds. We expect that, for these funds, higher levels of active management should be associated with even stronger sustainability performance. The results, presented in Table 3, show that while the overall positive effect of active management persists, the interaction with the ESG fund indicator yields mixed and somewhat unexpected results. Specifically, within ESG-oriented funds, active management is positively associated with the incidence of labor and environmental violations in columns

¹¹Percentages are calculated as $(\frac{\text{MeanViolationIndicator}}{\text{MeanViolationIndicator} - \beta_n \cdot 0.279} - 1) \cdot 100$, where β_n is the corresponding coefficient from Table 2, and 0.279 is the standard deviation of *Active Share*.

Table 2: Active Management and Compliance Violations

	Violations Indicator				log Amount of Penalties			
	Any (1)	Labor (2)	Environ. (3)	Consumer (4)	Any (5)	Labor (6)	Environ. (7)	Consumer (8)
Active Share	-0.118*** (-11.81)	-0.165*** (-14.797)	-0.043*** (-4.927)	-0.101*** (-16.03)	-2.561*** (-19.248)	-4.660*** (-22.654)	-5.361*** (-23.409)	-5.059*** (-23.978)
% available to retail	-0.001 (-0.097)	-0.0004 (-0.038)	-0.006 (-0.75)	-0.002 (-0.429)	0.115 (1.226)	0.305** (2.162)	0.205 (1.146)	0.336** (2.054)
% sin stocks	0.284** (2.355)	0.489** (2.246)	0.227 (1.487)	0.138* (1.845)	2.404*** (3.277)	6.924*** (3.477)	5.445 (1.533)	4.590*** (4.845)
% oil/gas/coal stocks	0.309*** (10.102)	0.185*** (4.646)	0.629*** (12.287)	-0.237*** (-10.554)	1.555*** (4.27)	1.205*** (2.629)	9.816*** (12.739)	-5.385*** (-7.656)
% tech. stocks	-0.121*** (-4.859)	-0.136*** (-5.672)	-0.137*** (-7.12)	0.014 (0.943)	2.179*** (7.416)	0.719 (1.544)	-2.399*** (-4.939)	1.454*** (2.982)
log Fund TNA	-0.007*** (-4.094)	-0.009*** (-4.834)	-0.006*** (-3.514)	-0.003*** (-2.917)	-0.075*** (-3.406)	-0.188*** (-5.428)	-0.137*** (-3.284)	-0.141*** (-4.114)
log Fund Age	0.019*** (5.554)	0.020*** (5.442)	0.009*** (2.775)	0.013*** (5.77)	0.228*** (5.245)	0.413*** (6.478)	0.267*** (3.339)	0.378*** (5.419)
Annual return	-0.047*** (-3.445)	0.013 (0.936)	-0.028*** (-2.637)	-0.007 (-0.699)	0.331 (1.47)	1.779*** (6.037)	-0.006 (-0.019)	0.384 (1.088)
Return volatility	-1.668 (-1.602)	-1.524 (-1.343)	-5.183*** (-5.732)	1.563** (2.494)	-3.164 (-0.192)	-18.72 (-0.972)	-117.6*** (-4.584)	-119.8*** (-4.062)
log Firm TNA	0.085*** (56.077)	0.046*** (24.922)	0.031*** (20.206)	0.092*** (73.16)	1.448*** (54.355)	0.917*** (28.416)	0.801*** (17.571)	1.818*** (45.199)
Adj. R ²	0.475	0.295	0.369	0.653	0.52	0.347	0.327	0.484
FE	adv-year	adv-year	adv-adv	adv-year	adv-year	adv-year	adv-year	adv-year
Obs.	16,529	16,529	16,529	16,529	16,529	16,529	16,529	16,529

This table presents the estimated relationship between a fund's level of active management and its portfolio-level compliance violations. The key independent variable is active share, which measures the level of active management by quantifying the similarity between a fund's holdings and the constituents of market indexes, following the methodology of Cremers and Petajisto (2009). Standard errors are clustered at the fund level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. t-statistics are reported in parentheses.

(2) and (3), suggesting that increasing activeness among these funds is linked to a higher rate of such violations relative to non-ESG funds managed by the same advisor. However, the interaction is negative for consumer violations and penalty amounts, columns (4)-(5) and (8), indicating that ESG-oriented funds achieve a greater reduction in penalty size and consumer-related violations as active management increases, compared to their non-ESG counterparts. One possible explanation for these counterintuitive findings is the presence of activist investors among actively managed ESG-oriented funds. Such funds may deliberately hold firms with weaker labor or environmental records in order to engage with them and promote better practices through a voice strategy.

Another potential explanation, frequently discussed in the context of ESG investing, is greenwashing, i.e. funds failing to adhere to their stated commitments to responsible investing. Actively managed ESG funds, given their greater flexibility and looser ties to benchmark indexes, may have more room to greenwash. However, this would not fully explain the observed reduction in actual penalties, suggesting that some ESG-focused active managers may still be effective in mitigating certain types of sustainability risks, particularly those with direct financial implications. Moreover, the stronger sustainability performance with increase in active management for non-ESG funds under the same advisor firm raises questions. It is difficult to justify why explicitly ESG-oriented funds

would engage in greenwashing while their non-ESG counterparts from the same advisor would hold portfolios with better sustainability metrics.

Table 3: Active Management of ESG Funds and Compliance Violations

	Violations Indicator				log Amount of Penalties			
	Any (1)	Labor (2)	Environ. (3)	Consumer (4)	Any (5)	Labor (6)	Environ. (7)	Consumer (8)
ESG fund*Active Share	0.043* (1.728)	0.058** (1.977)	0.069*** (3.063)	-0.041** (-2.504)	-0.865** (-2.13)	-0.206 (-0.436)	0.282 (0.416)	-3.87*** (-3.877)
Active Share	-0.120*** (-11.73)	-0.168*** (-14.777)	-0.046*** (-5.16)	-0.099*** (-15.392)	-2.523*** (-18.514)	-4.656*** (-22.149)	-5.379*** (-23.083)	-4.882*** (-22.993)
ESG fund	-0.001 (-0.097)	-0.006 (-0.326)	-0.047*** (-3.501)	0.012 (1.11)	0.510** (2.031)	0.51 (1.505)	0.218 (0.497)	1.946*** (3.18)
% available to retail	-0.001 (-0.173)	-0.001 (-0.122)	-0.006 (-0.732)	-0.002 (-0.37)	0.115 (1.231)	0.294** (2.089)	0.194 (1.089)	0.346** (2.13)
% sin stocks	0.296** (2.413)	0.503** (2.285)	0.231 (1.505)	0.130* (1.721)	2.335*** (3.185)	7.035*** (3.489)	5.593 (1.561)	4.169*** (4.487)
% oil/gas/coal stocks	0.312*** (10.139)	0.188*** (4.706)	0.630*** (12.312)	-0.239*** (-10.619)	1.533*** (4.204)	1.220*** (2.649)	9.843*** (12.743)	-5.497*** (-7.839)
% tech. stocks	-0.123*** (-4.939)	-0.139*** (-5.794)	-0.138*** (-7.147)	0.015 (1.037)	2.191*** (7.451)	0.698 (1.495)	-2.427*** (-5.009)	1.531*** (3.123)
log Fund TNA	-0.007*** (-3.951)	-0.009*** (-4.681)	-0.006*** (-3.54)	-0.003*** (-3.058)	-0.076*** (-3.431)	-0.184*** (-5.313)	-0.133*** (-3.186)	-0.147*** (-4.302)
log Fund Age	0.019*** (5.778)	0.022*** (5.703)	0.009*** (2.71)	0.013*** (5.495)	0.226*** (5.143)	0.427*** (6.631)	0.282*** (3.482)	0.358*** (5.079)
Annual return	-0.047*** (-3.453)	0.013 (0.928)	-0.028*** (-2.599)	-0.007 (-0.701)	0.327 (1.452)	1.773*** (6.022)	-0.01 (-0.031)	0.371 (1.047)
Return volatility	-1.614 (-1.556)	-1.455 (-1.289)	-5.158*** (-5.714)	1.526** (2.437)	-3.583 (-0.218)	-18.27 (-0.949)	-116.9*** (-4.566)	-122.1*** (-4.168)
log Firm TNA	0.085*** (55.899)	0.046*** (24.895)	0.031*** (20.223)	0.092*** (72.922)	1.446*** (53.987)	0.914*** (28.208)	0.799*** (17.479)	1.809*** (45.123)
Adj. R ²	0.476	0.297	0.37	0.653	0.521	0.347	0.328	0.487
FE	adv-year	adv-year	adv-year	adv-year	adv-year	adv-year	adv-year	adv-year
Obs.	16,529	16,529	16,529	16,529	16,529	16,529	16,529	16,529

This table presents the estimated relationship between a fund's active management and its portfolio-level compliance violations, comparing the effect for ESG funds relative to non-ESG funds managed by the same advisors in the same years. Standard errors are clustered at the fund level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. t-statistics are reported in parentheses.

Finally, we examine the effect of active management using a categorical specification, comparing passive and highly active funds to a reference group of moderately active funds. As discussed in Section 4.1, the distribution of *Active Share* is heavily concentrated near the upper bound, indicating a substantial number of highly active funds in the sample. This suggests that the relationship between active management and sustainability outcomes may be primarily driven by the behavior of these highly active funds, suggesting a non-linear effect. To account for this possibility, we replace the continuous *Active Share* measure with active management categories. The results, estimating the differences in violation incidence and penalty amounts across active management categories, are reported in Table 4.

The results continue to support evidence that active management is linked to better portfolio sustainability, as suggested by a lower incidence of compliance violations and reduced violation penalties associated with the highly active fund dummy. Furthermore, the specifications using the

Table 4: Active Management Categories and Compliance Violations

	Violations Indicator				log Amount of Penalties			
	Any (1)	Labor (2)	Environ. (3)	Consumer (4)	Any (5)	Labor (6)	Environ. (7)	Consumer (8)
Highly Active Fund	-0.052*** (-8.734)	-0.071*** (-10.9)	-0.014*** (-2.614)	-0.045*** (-11.224)	-1.281*** (-18.443)	-2.355*** (-20.966)	-2.792*** (-20.584)	-2.533*** (-22.641)
Passive Fund	0.021*** (5.074)	0.032*** (6.754)	0.008** (1.973)	0.023*** (6.894)	0.296*** (7.29)	0.53*** (7.809)	0.753*** (8.78)	0.578*** (8.454)
ESG fund	-0.006 (-0.546)	-0.005 (-0.491)	-0.019* (-1.825)	-0.033*** (-3.806)	-0.19 (-1.479)	-0.291* (-1.761)	-0.507 (-1.565)	-0.093 (-0.416)
Highly Active*ESG fund	0.052*** (3.278)	0.064*** (3.571)	0.041*** (2.661)	0.013 (1.156)	-0.033 (-0.141)	0.81*** (3.178)	1.281*** (2.888)	-1.571*** (-2.928)
Passive*ESG fund	0.022* (1.764)	0.021 (1.556)	0.004 (0.341)	0.021* (1.951)	0.2 (1.354)	0.625*** (2.915)	0.705* (1.945)	-0.07 (-0.273)
Adj. R ²	0.474	0.293	0.368	0.655	0.522	0.35	0.34	0.492
FE	adv-year	adv-year	adv-year	adv-year	adv-year	adv-year	adv-year	adv-year
Obs.	16,529	16,529	16,529	16,529	16,529	16,529	16,529	16,529

This table presents the estimated relationships between active management categories and portfolio-level compliance violations. All specifications control for the percentage of fund shares available to retail investors, the percentage of sin stocks, oil/gas/coal stocks, and technology stocks in the portfolio, as well as the logarithm of fund TNA, logarithm of fund age, annual return, return volatility, and the logarithm of firm-level TNA. Standard errors are clustered at the fund level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. t-statistics are reported in parentheses.

categorical measure of active management reveal that passive funds are more likely to hold firms with poorer violation records than their moderately active counterparts under the same advisor firm, as indicated by the consistently positive coefficients on the passive fund dummy across all violation types. However, the findings for highly active ESG-oriented funds remain mixed. Consistent with our earlier findings for explicitly ESG-oriented funds and continuous measurement of activeness, the interaction between the highly active category and the ESG-fund indicator yields positive coefficients for overall violations, column (1), labor violations, column (2), and environmental violations, column (3). This indicates that funds that are both highly active and ESG-oriented experience a higher incidence of these violations than their non-ESG counterparts. In the categorical specification, highly active ESG funds are also associated with larger penalty amounts for labor, column (6), and environmental violations, column (7), relative to non-ESG funds within the same advisor company. By contrast, they exhibit better performance on consumer-related violations, as evidenced by the negative coefficient for consumer penalty amounts in column (8).

Overall, the findings suggest that active management is associated with stronger sustainability outcomes in terms of compliance violations. While previous research has argued that ESG funds tend to hold firms with more violations and higher penalties, our results indicate that active management mitigates this effect. This highlights the critical role of active stock selection rather than ESG labeling in improving sustainability performance. Notably, the positive effect of active management persists regardless of a fund's explicit ESG orientation. In contrast, highly active explicitly ESG-oriented funds exhibit weaker sustainability performance across labor and environmental violations indicators. This latter finding may point to the presence of activist mutual funds that intentionally hold firms with poorer sustainability records, aiming to influence and improve their practices.

4.4 Portfolio CO2 Emissions

Next, we examine the CO2 emissions of firms held within a fund’s portfolio, considering both absolute emissions and emissions intensity, defined as the ratio of emissions to firm sales. Carbon emissions are considered a central indicator of corporate environmental performance, as production-related emissions are a major contributor to global greenhouse gas emissions¹², and they have a direct impact on climate change (Nordhaus, 1977; Nordhaus and Boyer, 2003). Consequently, reducing carbon emissions is widely regarded as a core objective of corporate environmental sustainability (Giglio et al., 2021). The estimated effect of active fund management on portfolio-level CO2 emissions is reported in Table 5.

Table 5: Active Management and Portfolio Level CO2 Emissions

	log CO2 Emissions			log CO2 Emissions to Sales		
	Scope 1 (1)	Scope 2 (2)	Scope 3 (3)	Scope 1 (4)	Scope 2 (5)	Scope 3 (6)
Active Share	-1.706*** (-16.832)	-0.646*** (-11.429)	-1.345*** (-16.103)	-1.643*** (-16.064)	-0.342*** (-8.269)	-1.238*** (-17.006)
% available to retail	0.063 (0.682)	0.021 (0.489)	0.001 (0.016)	0.056 (0.596)	-0.009 (-0.238)	-0.036 (-0.55)
% sin stocks	3.16** (2.083)	1.802*** (3.165)	4.108** (2.448)	0.863 (0.82)	0.246 (0.924)	2.700** (2.077)
% oil/gas/coal stocks	6.004*** (13.013)	1.720*** (6.63)	4.435*** (9.479)	5.118*** (12.46)	0.837*** (3.624)	3.844*** (9.593)
% tech. stocks	-1.284*** (-5.525)	-0.479*** (-3.854)	0.111 (0.638)	-1.862*** (-7.948)	-1.222*** (-10.479)	-0.918*** (-6.11)
log Fund TNA	-0.023 (-1.127)	-0.022** (-2.242)	-0.05*** (-3.059)	-0.009 (-0.451)	0.005 (0.613)	-0.035** (-2.449)
log fund Age	0.031 (0.792)	0.007 (0.352)	0.028 (0.893)	-0.001 (-0.013)	-0.044*** (-2.702)	-0.005 (-0.17)
Annual return	-0.358*** (-2.719)	0.09 (1.247)	0.036 (0.257)	-1.168*** (-7.797)	-0.608*** (-8.407)	-0.594*** (-4.768)
Return volatility	-118.7*** (-9.663)	-15.9** (-2.547)	-68.12*** (-7.417)	-135.2*** (-10.68)	-26.91*** (-4.732)	-69.52*** (-8.356)
log Firm TNA	0.304*** (13.248)	0.473*** (38.785)	0.592*** (29.246)	-0.251*** (-11.238)	-0.188*** (-20.398)	-0.055*** (-3.321)
Adj. R ²	0.343	0.473	0.445	0.245	0.253	0.291
FE	adv-year	adv-year	adv-year	adv-year	adv-year	adv-year
Obs.	16,242	16,243	15,938	15,933	15,971	15,812

This table reports the estimated relationships between a fund’s active management and its portfolio-level CO2 emissions and emissions intensity. The key independent variable is active share, which measures the level of active management by quantifying the similarity between a fund’s holdings and the constituents of market indexes, following the methodology of Cremers and Petajisto (2009). 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.

For sustainability performance measured using log-transformed unscaled CO2 emissions and log CO2 emissions intensity, i.e., emissions relative to firm output, active management also shows a strong negative association on portfolio-level. This suggests that actively managed mutual fund portfolios tend to hold firms with stronger environmental sustainability metrics. Specifically, a one-

¹²According to Climate Watch data, electricity and heat production, manufacturing and construction, and industry processes collectively accounted for 52% of global CO2 emissions in 2021. Source: Climate Watch – with major processing by Our World in Data. “Other fuel combustion” [dataset]. Climate Watch, “Greenhouse gas emissions by sector” [original data], *Our World in Data*, 2024 – [Our World in Data](#).

standard-deviation increase in difference from market capitalization benchmarks is associated with a 3.6% decrease in log Scope 1 CO2 emissions, a 1.4% decrease in log Scope 2, and a 2.5% decrease in log Scope 3.¹³ Crucially, these effects are not merely driven by firm size. The estimates for unscaled emissions account for firm-level TNA, and the improvements remain robust when using emissions intensity as the outcome variable. For emissions scaled by firm sales, a one-standard-deviation increase in active management is linked to a 12% reduction in log Scope 1 emissions intensity, a 3% reduction in log Scope 2, and a 7% reduction in log Scope 3 emissions intensity. In the appendix, we additionally estimate emissions intensity as log CO2 emissions relative to a firm’s total net assets, while controlling for the logarithm of the value-weighted average of firm gross sales. The negative relationship between active management and emissions intensity remains robust under the alternative emissions intensity measurement.

We then examine the effect of active management on portfolio-level CO2 emissions within explicitly ESG-oriented funds by including an interaction term between *Active Share* and the ESG fund dummy. Table 6 presents the results. While ESG funds appear to hold portfolios with lower Scope 1 and Scope 3 CO2 emissions, columns (1) and (3), as well as lower Scope 2 emissions intensity, column (5), compared to non-ESG funds under the same advisor company, our estimates reveal a positive and statistically significant interaction between active management and the ESG fund dummy for unscaled Scope 3 emissions in column (3). This suggests that increased active management within ESG-oriented funds is associated with higher reported Scope 3 emissions, relative to the effect for non-ESG funds offered by the same advisor, consistent with our earlier finding that active management within ESG funds exhibits comparatively poorer sustainability performance.

However, Scope 3 emissions data are often estimated rather than directly disclosed, as many firms do not fully report this category. Even firms that do provide Scope 3 emissions data typically rely on estimation methods to account for upstream supply chain and downstream product-use emissions (Aswani et al., 2024; Mahieux et al., 2025; Serafeim and Velez Caicedo, 2022). Consequently, Scope 3 emissions are more susceptible to measurement error and more likely to correlate with firm size or output levels. The positive interaction effect may therefore reflect ESG funds that actively consider Scope 3 emissions when evaluating firms’ environmental performance, meaning they may preferentially invest in companies that disclose or estimate Scope 3 emissions even if those estimates are inherently biased upward due to the nature of the metric. Supporting this interpretation, the positive interaction effect disappears when Scope 3 emissions are scaled by firm output, i.e., when using emissions intensity, suggesting that the prior finding for unscaled emissions could be driven by differences in firm size rather than underlying environmental performance.

To account for potential non-linear effects of active management across its distribution, we again incorporate active management as categorical variable rather than using a continuous measure. The results are presented in Table 7. Notably, we continue to find a negative and statistically

¹³The percentages are calculated as $(\frac{\text{MeanLogCO}_2\text{Emissions}}{\text{MeanLogCO}_2\text{Emissions} - \beta_n \cdot 0.279} - 1) \cdot 100$, where β_n represents the corresponding coefficient from Table 5, and 0.279 is the standard deviation of *Active Share*.

Table 6: Active Management of ESG Funds and Portfolio Level CO2 Emissions

	log CO2 Emissions			log CO2 Emissions to Sales		
	Scope 1 (1)	Scope 2 (2)	Scope 3 (3)	Scope 1 (4)	Scope 2 (5)	Scope 3 (6)
ESG fund*Active Share	0.603* (1.89)	0.176 (1.032)	0.922*** (3.019)	0.268 (0.76)	0.296* (1.73)	0.152 (0.593)
Active Share	-1.729*** (-16.748)	-0.655*** (-11.403)	-1.388*** (-16.34)	-1.653*** (-15.895)	-0.356*** (-8.488)	-1.247*** (-16.92)
ESG fund	-0.636*** (-3.231)	-0.016 (-0.167)	-0.438** (-2.533)	-0.341 (-1.616)	-0.194** (-2.114)	0.112 (0.676)
% available to retail	0.071 (0.764)	0.019 (0.437)	-0.001 (-0.008)	0.061 (0.647)	-0.008 (-0.222)	-0.041 (-0.625)
% sin stocks	3.114** (2.063)	1.846*** (3.204)	4.219** (2.489)	0.823 (0.785)	0.264 (0.983)	2.780** (2.111)
% oil/gas/coal stocks	6.004*** (13.013)	1.730*** (6.667)	4.465*** (9.544)	5.115*** (12.45)	0.843*** (3.655)	3.86*** (9.616)
% tech. stocks	-1.275*** (-5.489)	-0.487*** (-3.931)	0.094 (0.541)	-1.854*** (-7.92)	-1.225*** (-10.538)	-0.932*** (-6.227)
log Fund TNA	-0.025 (-1.252)	-0.021** (-2.137)	-0.048*** (-2.977)	-0.011 (-0.54)	0.005 (0.609)	-0.033** (-2.31)
log Fund Age	0.022 (0.551)	0.01 (0.543)	0.034 (1.073)	-0.007 (-0.17)	-0.044*** (-2.68)	0.003 (0.119)
Annual return	-0.351*** (-2.671)	0.09 (1.246)	0.037 (0.264)	-1.165*** (-7.775)	-0.606*** (-8.386)	-0.597*** (-4.791)
Return volatility	-118.8*** (-9.661)	-15.7** (-2.52)	-67.58*** (-7.383)	-135.3*** (-10.676)	-26.79*** (-4.714)	-69.18*** (-8.352)
log Firm TNA	0.307*** (13.331)	0.473*** (38.695)	0.595*** (29.393)	-0.249*** (-11.11)	-0.187*** (-20.218)	-0.056*** (-3.331)
Adj. R ²	0.344	0.474	0.447	0.246	0.253	0.292
FE	adv-year	adv-year	adv-year	adv-year	adv-year	adv-year
Obs.	16,242	16,243	15,938	15,933	15,971	15,812

This table reports the estimated relationships between a fund's active management and its portfolio-level CO2 emissions and emissions intensity, comparing the effect for ESG funds relative to non-ESG funds managed by the same advisors in the same years. 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.

significant coefficient for the highly active management category, indicating that highly active funds are associated with lower CO2 emissions compared to moderately active funds managed by the same advisor company. Additionally, the coefficients for the passive management category are positive, suggesting that passively managed funds tend to hold portfolios with higher levels of CO2 emissions and emissions intensity compared to their moderately actively managed counterparts.

Still, the effect of active management on emissions is not homogeneous across ESG-oriented and non-ESG funds managed by the same advisor firm. We find that highly active ESG funds consistently exhibit poorer CO2 emissions performance compared to their non-ESG counterparts. Specifically, the results indicate significantly higher log Scope 1 as well as Scope 2 and 3 of unscaled emissions. In addition, highly active ESG funds display greater emissions intensity across Scopes 1-2 relative to highly active non-ESG funds within the same advisor. This further reinforces the previous result that highly actively managed ESG-oriented funds tend to underperform their actively managed non-ESG counterparts on portfolio-level sustainability.

Table 7: Active Management Categories and Portfolio Level CO2 Emissions

	log CO2 Emissions			log CO2 Emissions to Sales		
	Scope 1 (1)	Scope 2 (2)	Scope 3 (3)	Scope 1 (4)	Scope 2 (5)	Scope 3 (6)
Highly Active Fund	-0.846*** (-12.104)	-0.282*** (-8.174)	-0.746*** (-13.005)	-0.763*** (-10.943)	-0.099*** (-3.67)	-0.562*** (-11.361)
Passive Fund	0.325*** (5.685)	0.184*** (7.272)	0.155*** (3.372)	0.353*** (6.106)	0.147*** (7.708)	0.224*** (5.671)
ESG Fund	-0.685*** (-4.662)	-0.042 (-0.751)	0.072 (0.619)	-0.575*** (-3.26)	-0.112** (-2.01)	0.213* (1.823)
Highly Active*ESG Fund	0.748*** (3.528)	0.230** (2.42)	0.417** (2.201)	0.595** (2.405)	0.215** (2.161)	0.058 (0.352)
Passive Fund*ESG Fund	0.257 (1.55)	0.071 (1.082)	-0.188 (-1.471)	0.321* (1.679)	0.038 (0.603)	-0.115 (-0.938)
Adj. R ²	0.351	0.477	0.451	0.251	0.254	0.291
FE	adv-year	adv-year	adv-year	adv-year	adv-year	adv-year
Obs.	162,42	16,243	15,938	15,933	15,971	15,812

This table presents the estimated relationships between active management categories and portfolio-level CO2 emissions and emissions intensity. All specifications control for the percentage of fund shares available to retail investors, the percentage of sin stocks, oil/gas/coal stocks, and technology stocks in the portfolio, as well as the logarithm of fund TNA, logarithm of fund age, annual return, return volatility, and the logarithm of firm-level TNA. Standard errors are clustered at the fund level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. t-statistics are reported in parentheses.

4.5 Portfolio Third-Party Sustainability Scores

Lastly, Table 8 presents the results using ESG scores and a reputational risk index as alternative measures of portfolio-level sustainability. Despite widespread criticism of ESG scores as indicators of corporate sustainability (Berg et al., 2021, 2022; Larcher et al., 2022), we include these results to capture potential divergences between more transparent indicators, such as violation penalties and carbon emissions, and perceived sustainability as reflected by ESG rating providers.

The relationship between active management and third-party sustainability assessments appears inconsistent. While active management is positively associated with higher environmental scores, as shown in column (2), and a 7% reduction in the reputational risk index for a one standard deviation increase in active management, column (5), it is also linked to lower governance scores, as indicated by the negative coefficient in column (4). This suggests that actively managed funds may be more exposed to firms with weaker governance. These findings contribute to the debate over whether ESG initiatives enhance shareholder value or instead reflect weaker corporate governance and agency problems (Bénabou and Tirole, 2010; Gillan et al., 2021), by showing that stronger environmental performance in the portfolios of actively managed funds is accompanied by weaker governance outcomes among the firms they hold.

These findings persist when we include the interaction with the ESG fund dummy in Table 9. Active management continues to be associated with higher portfolio-level E scores and lower reputational risk, while still correlating with lower G scores. Moreover, the interaction term reveals that an increase in active management within ESG-oriented funds significantly enhances E scores compared

Table 8: Active Management and Portfolio Level Sustainability Scores

	ESG Scores (1)	E Scores (2)	S Scores (3)	G Scores (4)	RepRisk Index (5)
Active Share	-0.359 (-0.804)	2.093*** (3.41)	0.42 (1.032)	-3.065*** (-6.599)	-5.150*** (-11.441)
% available to retail	-0.135 (-0.343)	-0.582 (-1.032)	-0.188 (-0.517)	0.132 (0.332)	-0.065 (-0.197)
% sin stocks	12.31* (1.66)	18.22** (2.379)	10.24 (1.168)	1.665 (0.373)	32.27*** (3.507)
% oil/gas/coal stocks	3.999** (2.373)	8.489*** (3.431)	-1.849 (-1.146)	10.99*** (7.186)	8.002*** (4.935)
% tech. stocks	4.851*** (5.142)	-0.04 (-0.028)	10.39*** (11.725)	-2.257** (-2.177)	3.524*** (4.092)
log Fund TNA	0.161* (1.869)	0.221* (1.817)	0.274*** (3.507)	-0.039 (-0.446)	-0.086 (-1.118)
log Fund Age	-0.04 (-0.239)	-0.16 (-0.658)	-0.209 (-1.371)	0.369** (2.153)	0.288* (1.928)
Annual return	-0.132 (-0.226)	-2.691*** (-3.231)	-0.184 (-0.325)	1.485** (2.273)	2.877*** (5.023)
Return volatility	-272.06*** (-4.013)	-476.6*** (-4.897)	-249.4*** (-4.079)	-90.37 (-1.355)	245.4*** (3.769)
log Firm TNA	6.054*** (75.441)	9.021*** (82.171)	6.381*** (81.304)	3.425*** (42.937)	5.639*** (69.53)
Adj. R ²	0.715	0.721	0.758	0.412	0.742
FE	adv-year	adv-year	adv-year	adv-year	adv-year
Obs.	16,483	16,483	16,483	16,483	12,908

This table reports the estimated relationships between a fund's active management and its portfolio-level ESG Scores and RepRisk Index. The key independent variable is Active Share, which measures the level of active management by quantifying the similarity between a fund's holdings and the constituents of market indexes, following the methodology of Cremers and Petajisto (2009). 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.

to this effect for non-ESG funds under the same asset management advisor. Specifically, ESG funds experience an additional 5% increase in environmental scores with a one-standard-deviation increase in active management. Though this results is seemingly straightforward since active management within explicitly ESG-oriented funds is expected to emphasize portfolio sustainability, it contradicts our earlier conclusions. Specifically, we previously found that highly active ESG funds were associated with poorer environmental sustainability outcomes in terms of actual CO2 emissions and emissions intensity. While these findings appear contradictory, they are in line with the conclusions of prior studies, which show that third-party sustainability scores do not necessarily reflect superior ESG performance (Berg et al., 2022; Raghunandan and Rajgopal, 2022).

We conclude our analysis of portfolio-level sustainability measured with ESG scores and reputational risk by examining active management as a categorical variable and interacting it with the ESG-oriented fund indicator. The corresponding results are presented in Table 10. The findings suggest that the positive impact of active management on environmental scores is primarily driven by the left tail of the active management distribution; that is, funds with low active share are associated with significantly lower E scores compared to moderately active funds, while highly active funds do not significantly differ from moderately active ones in terms of E scores, column (2). Furthermore, highly active non-ESG funds tend to outperform their ESG-oriented counterparts from

Table 9: Active Management of ESG Funds and Portfolio Level Sustainability Scores

	ESG Scores (1)	E Scores (2)	S Scores (3)	G Scores (4)	RepRisk Index (5)
ESG fund*Active Share	1.919 (1.216)	8.726*** (3.716)	0.961 (0.691)	-1.481 (-0.815)	-1.091 (-0.927)
Active Share	-0.49 (-1.081)	1.637*** (2.643)	0.328 (0.796)	-3.022*** (-6.406)	-5.107*** (-11.245)
ESG fund	1.977** (2.146)	-0.528 (-0.405)	2.778*** (3.13)	2.425** (2.395)	0.811 (1.101)
% available to retail	-0.217 (-0.559)	-0.705 (-1.269)	-0.276 (-0.773)	0.09 (0.229)	-0.07 (-0.215)
% sin stocks	13.49* (1.779)	20.44*** (2.585)	11.42 (1.276)	2.058 (0.455)	32.24*** (3.496)
% oil/gas/coal stocks	4.213** (2.491)	8.952*** (3.62)	-1.647 (-1.02)	11.04*** (7.179)	7.984*** (4.915)
% tech. stocks	4.624*** (4.881)	-0.461 (-0.321)	10.17*** (11.432)	-2.336** (-2.253)	3.529*** (4.095)
log Fund TNA	0.196** (2.271)	0.276** (2.286)	0.310*** (3.984)	-0.024 (-0.271)	-0.085 (-1.105)
log Fund Age	0.079 (0.472)	0.029 (0.119)	-0.084 (-0.55)	0.424** (2.446)	0.294* (1.942)
Annual return	-0.163 (-0.279)	-2.710*** (-3.259)	-0.223 (-0.394)	1.458** (2.229)	2.869*** (5.01)
Return volatility	-266.8*** (-3.944)	-465.9*** (-4.829)	-244.26*** (-4.01)	-88.9 (-1.333)	245.1*** (3.768)
log Firm TNA	6.042*** (76.382)	9.021*** (84.154)	6.365*** (81.828)	3.412*** (42.766)	5.634*** (69.138)
Adj. R ²	0.719	0.726	0.761	0.413	0.742
FE	adv-year	adv-year	adv-year	adv-year	adv-year
Obs.	16,483	16,483	16,483	16,483	12,908

This table reports the estimated relationships between a fund's active management and its portfolio-level ESG Scores and RepRisk Index, comparing the effect for ESG funds relative to non-ESG funds managed by the same advisors in the same years. 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 same advisor company in managing reputational risk, as indicated by the negative and significant coefficient for the highly active fund category and the insignificant coefficient on the interaction term in column (5). Finally, when distinguishing between active and passive ESG-oriented funds, we find that moderately active ESG funds outperform moderately active non-ESG funds across several dimensions, including overall ESG, as well as E, S, and G pillar scores.

Overall, the findings indicate that, with respect to third-party sustainability scores, the positive effect of active management is primarily driven by passive funds underperforming relative to moderately active funds. In contrast, for other sustainability measures such as the presence of compliance violations and CO2 emissions highly active funds consistently outperform moderately active investment strategies. We also find that ESG-oriented funds outperform non-ESG funds with comparable levels of active management in terms of overall ESG scores as well as the individual E, S, and G pillars.

Table 10: Active Management Categories and Portfolio Level Sustainability Scores

	ESG Scores (1)	E Scores (2)	S Scores (3)	G Scores (4)	RepRisk Index (5)
Highly Active Fund	-0.249 (-0.926)	0.658* (1.733)	-0.025 (-0.102)	-1.265*** (-4.524)	-2.464*** (-9.883)
Passive Fund	-0.057 (-0.275)	-0.746** (-2.573)	-0.254 (-1.272)	0.546*** (2.823)	1.094*** (5.906)
ESG Fund	3.729*** (5.753)	4.946*** (5.385)	4.37*** (6.932)	1.838*** (2.88)	-0.801 (-1.53)
Highly Active*ESG Fund	-0.087 (-0.087)	2.585* (1.712)	-0.92 (-1.02)	-0.846 (-0.772)	0.915 (1.212)
Passive Fund*ESG Fund	-0.933 (-1.263)	-1.118 (-1.086)	-1.223 (-1.599)	-0.337 (-0.491)	0.94 (1.584)
Adj. R ²	0.719	0.726	0.761	0.412	0.745
FE	adv-year	adv-year	adv-year	adv-year	adv-year
Obs.	16,483	16,483	16,483	16,483	12,908

This table presents the estimated relationships between active management categories and portfolio-level ESG Scores and RepRisk Index. All specifications control for the percentage of fund shares available to retail investors, the percentage of sin stocks, oil/gas/coal stocks, and technology stocks in the portfolio, as well as the logarithm of fund TNA, logarithm of fund age, annual return, return volatility, and the logarithm of firm-level TNA. Standard errors are clustered at the fund level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. t-statistics are reported in parentheses.

5 Extensions

5.1 Alternative Active Management

5.1.1 Deviation from Market Portfolio with ESG Indexes

Our main results measure active management using *Active Share*, which is calculated relative to the 20 most common market-capitalization-weighted indexes. A potential concern with this approach is that it may overestimate the level of active management for the growing number of passive ESG strategies, that is, strategies that track ESG-screened indexes without engaging in active stock selection. Since *Active Share* classifies any deviation from standard market-capitalization benchmarks as active, it may inflate the measure of active management in such cases. To address this concern, we refine our approach by incorporating ESG-screened market indexes into the calculation of *Active Share*. Specifically, we add the following indexes: 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, 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. This adjustment enables us to construct an alternative measure of active management, *Active Share ESG*, which accounts for passive ESG strategies. We then re-estimate our main specifications using this measure to evaluate the impact of active management relative to both market-capitalization benchmarks and

ESG-screened indexes on the sustainability outcomes of fund portfolios.

Table 11 presents the results, showing how active management measured against both conventional and ESG-adjusted benchmarks relates to the portfolio-level sustainability indicators employed throughout the analysis. The effect of active management persists even after accounting for difference from market benchmarks due to passive ESG strategies, indicating that deviations from explicitly ESG-screened indexes are also associated with improved sustainability outcomes, albeit with smaller effect sizes. Panel A shows that higher *Active Share ESG* is linked to a lower incidence of overall violations, as well as reductions in labor and consumer violations. However, the association between active management and environmental violations is no longer significant. Regarding penalty amounts, increases in *Active Share ESG* are associated with lower penalties across all violation types, though the magnitudes are reduced compared to previous estimates. Panel B displays the estimates for CO2 emissions. An increase in active management measured relative to both market-cap and ESG-screened indexes is associated with lower absolute emissions as well as reduced emissions intensity. Panel C further indicates that such deviations are linked to higher ESG scores and lower reputational risks of portfolio.

Table 11: Active Management relative to market-cap and ESG-screened indexes

PANEL A	Violations Indicator				log Amount of Penalties			
	Any (1)	Labor (2)	Environ. (3)	Consumer (4)	Any (5)	Labor (6)	Environ. (7)	Consumer (8)
Active Share ESG	-0.051*** (-5.285)	-0.087*** (-7.905)	-0.0003 (-0.037)	-0.076*** (-11.476)	-1.662*** (-13.006)	-2.714*** (-15.01)	-3.610*** (-16.468)	-3.577*** (-15.31)
Adj. R ²	0.458	0.257	0.365	0.644	0.499	0.276	0.273	0.452
Obs.	16,529	16,529	16,529	16,529	16,529	16,529	16,529	16,529
PANEL B	log CO2 Emissions			log CO2 Emissions to Sales				
	Scope 1 (1)	Scope 2 (2)	Scope 3 (3)	Scope 1 (4)	Scope 2 (5)	Scope 3 (6)		
Active Share ESG	-1.143*** (-10.843)	-0.557*** (-9.64)	-1.062*** (-11.729)	-1.082*** (-9.827)	-0.362*** (-7.713)	-0.704*** (-8.931)		
Adj. R ²	0.314	0.468	0.434	0.215	0.253	0.264		
Obs.	16,242	16,243	15,938	15,933	15,971	15,812		
PANEL C	ESG Scores		E Scores	S Scores	G Scores	RepRisk Index		
	(1)		(2)	(3)	(4)	(5)		
Active Share ESG	1.642*** (3.782)		3.322*** (5.107)	1.540*** (3.701)	0.496 (1.157)	-4.892*** (-10.646)		
Adj. R ²	0.716		0.722	0.758	0.406	0.74		
Obs.	16,483		16,483	16,483	16,483	12,908		

This table reports the estimated relationships between a fund's active management and its portfolio-level sustainability. The key independent variable is active share ESG, which measures the level of active management by quantifying the similarity between a fund's holdings and the constituents of market indexes and ESG-screened indexes, following the methodology of Cremers and Petajisto (2009). Panel A presents estimates related to portfolio-level compliance violations. Panel B reports estimates for portfolio-level CO2 emissions and emissions intensity. Panel C provides results for portfolio-level ESG scores and the RepRisk Index. All specifications include advisor-year fixed effects and the control variables defined previously. Standard errors are clustered at the fund level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. t-statistics are reported in parentheses.

Overall, this extension suggests that active management contributes to improved sustainability outcomes, even beyond what can be achieved through passive ESG strategies.

5.1.2 Portfolio Turnover Ratio

To further test the robustness of the active management measurement, we consider an alternative proxy for fund activeness: the portfolio turnover ratio. Portfolio turnover reflects the frequency of trades executed by fund management and is defined by CRSP as the minimum of total aggregated sales or purchases of securities, divided by the fund’s average total net assets (TNA) over a 12-month period. This metric captures an alternative dimension of fund active management, namely, trading frequency. Essentially, more frequent trading indicates more frequent application of a fund manager’s stock-selection skills (Pástor et al., 2020). However, unlike *Active Share*, portfolio turnover does not capture the direction of trades, that is, whether the portfolio is becoming more or less similar to the market portfolio.

The estimations using the portfolio turnover ratio as an alternative measure of active management are presented in Table 12. In contrast to deviation from market indexes, portfolio turnover shows an contrasting relationship with portfolio sustainability, underscoring the conceptual differences between these two measures. Specifically, while higher portfolio turnover is associated with a lower incidence of environmental violations, it shows no significant relationship with the presence of other types of violations and is linked to higher violation penalties. This latter finding may reflect divestment from a firm following a penalty announcement. Since the penalty variable does not account for the exact timing of a fine and instead attributes the penalty to the entire year, the positive association may capture the fund’s ex-post reaction to a penalty rather than a proactive investment choice. Furthermore, turnover exhibits a positive association with CO2 emissions, suggesting that more frequent trading activity may correlate with higher portfolio-level carbon emissions. Regarding third-party sustainability assessments, increased turnover is associated with lower scores across all ESG pillars, indicating poorer perceived sustainability. However, the result for reputational risk remains consistent with previous findings, showing a decline with increased active management as measured by turnover.

Overall, the estimations using portfolio turnover suggest that it is not the trading frequency component of active management, but rather the strategic divergence from passive benchmarks that is associated with improved portfolio-level sustainability outcomes among U.S. mutual funds.

5.2 Firm-Level Disclosure

Another potential concern is that actively managed funds may favor smaller market-capitalization firms that either do not disclose sustainability information or have less accessible disclosures. As a result, these firms might not be covered by the databases used in this study for the firm-level sustainability indicators, and their sustainability footprints can be underestimated.

First, to assess this issue, we calculate data coverage separately for each data provider.¹⁴ Coverage for compliance violations is relatively high, with firms included in the database accounting

¹⁴The calculation of coverage is defined in Table 18 in the appendix.

Table 12: Turnover Ratio and Portfolio Sustainability

PANEL A	Violations Indicator				log Amount of Penalties			
	Any (1)	Labor (2)	Environ. (3)	Consumer (4)	Any (5)	Labor (6)	Environ. (7)	Consumer (8)
Turnover Ratio	-0.011 (-1.577)	-0.006 (-0.859)	-0.011** (-2.025)	-0.006 (-1.521)	0.269*** (3.495)	0.318*** (2.69)	0.32** (1.997)	0.651*** (4.795)
Adj. R ²	0.455	0.244	0.365	0.633	0.485	0.243	0.231	0.426
Obs.	16,529	16,529	16,529	16,529	16,529	16,529	16,529	16,529
PANEL B	log CO2 Emissions			log CO2 Emissions to Sales				
	Scope 1 (1)	Scope 2 (2)	Scope 3 (3)	Scope 1 (4)	Scope 2 (5)	Scope 3 (6)		
Turnover Ratio	0.201*** (2.849)	0.095*** (3.072)	0.158*** (2.823)	0.211*** (2.967)	0.007 (0.263)	0.062 (1.269)		
Adj. R ²	0.293	0.455	0.417	0.195	0.242	0.252		
Obs.	16,242	16,243	15,938	15,933	15,971	15,812		
PANEL C	ESG Scores		E Scores	S Scores	G Scores	RepRisk Index		
	(1)		(2)	(3)	(4)	(5)		
Turnover Ratio	-1.962*** (-6.893)		-2.960*** (-7.032)	-1.797*** (-6.876)	-1.484*** (-4.972)	-0.915*** (-3.994)		
Adj. R ²	0.718		0.723	0.76	0.409	0.728		
Obs.	16,483		16,483	16,483	16,483	12,908		

This table reports the estimated relationships between a fund's turnover ratio and its portfolio-level sustainability. The key independent variable is turnover ratio, which is defined as minimum (of aggregated sales or aggregated purchases of securities), divided by the average 12-month TNA of the fund. Panel A presents estimates related to portfolio-level compliance violations. Panel B reports estimates for portfolio-level CO2 emissions and emissions intensity. Panel C provides results for portfolio-level ESG scores and the RepRisk Index. All specifications include advisor-year fixed effects and the control variables defined previously. Standard errors are clustered at the fund level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. t-statistics are reported in parentheses.

for an average of 82% of a fund's TNA. However, coverage is notably lower for CO2 emissions, capturing only 50% of TNA in the average fund portfolio. For the LSEG ESG scores, this rate is 75%. Across the three indicators: violations, CO2 emissions, and ESG scores, coverage rates show a small negative correlation with active management and a positive correlation with firm size. This suggests that more actively managed funds are indeed more likely to invest in smaller firms with less information about their sustainability.¹⁵

As a sensitivity test, we re-calculate our portfolio-level sustainability measures under alternative assumptions for unreported or missing data. For violations, rather than excluding firms that have never appeared in the Violation Tracker database, we assume these firms can be treated as non-violators and assign them a value of zero for violation penalties. Given that the Violation Tracker monitors penalizing agencies rather than firms themselves, it is reasonable to assume that any firm penalized by a tracked agency would be captured in the database.¹⁶ For CO2 emissions, ESG scores, and reputational risk, we approximate missing firm-level data by imputing industry-year averages for each respective variable.

We then re-estimate the relationship between active management and portfolio sustainability.

¹⁵Correlations are provided in Table 23 in the appendix.

¹⁶However, it is worth mentioning that the Violation Tracker database does not include fines smaller than \$5,000, which we are unable to trace.

The results, presented in Table 13, continue to show a persistent negative association between active management and sustainability performance, indicating that higher levels of active management are linked to fewer compliance violations and lower CO2 emissions, under alternative assumptions for handling missing firm-level data.

Table 13: Active Management and Portfolio Sustainability: Disclosure Sensitivity Test

PANEL A	Violations Indicator				log Amount of Penalties			
	Any (1)	Labor (2)	Environ. (3)	Consumer (4)	Any (5)	Labor (6)	Environ. (7)	Consumer (8)
Active Share	-0.164*** (-13.481)	-0.172*** (-14.594)	-0.052*** (-5.945)	-0.129*** (-19.917)	-2.733*** (-19.781)	-4.767*** (-22.701)	-5.397*** (-23.523)	-5.127*** (-24.364)
Adj. R ²	0.551	0.389	0.398	0.694	0.548	0.372	0.347	0.505
Obs.	16,529	16,529	16,529	16,529	16,529	16,529	16,529	16,529
PANEL B	log CO2 Emissions			log CO2 Emissions to Sales				
	Scope 1 (1)	Scope 2 (2)	Scope 3 (3)	Scope 1 (4)	Scope 2 (5)	Scope 3 (6)		
Active Share	-1.119*** (-16.34)	-0.503*** (-14.844)	-0.755*** (-17.789)	-0.148* (-1.933)	0.528*** (8.699)		0.362*** (3.76)	
Adj. R ²	0.352	0.406	0.533	0.362	0.379		0.285	
Obs.	16,529	16,529	16,529	16,258	16,301		16,441	
PANEL C	ESG Scores (1)		E Scores (2)	S Scores (3)	G Scores (4)	RepRisk Index (5)		
Active Share	-1.61*** (-4.187)		-0.507 (-0.94)	-1.028*** (-2.872)	-3.134*** (-8.561)	-6.246*** (-17.216)		
Adj. R ²	0.674		0.662	0.721	0.464	0.746		
Obs.	16,529		16,529	16,529	16,529	12,910		

This table reports the estimated relationships between a fund's active management and its portfolio-level sustainability. PANEL A uses portfolio-level compliance violations as dependent variable, treating violation penalties as zero for firms that never appeared in the violation tracker database. PANEL B uses portfolio-level CO2 emissions as dependent variable, where missing firm-level emissions data is replaced with the industry-year average. PANEL C uses portfolio-level ESG scores and the RepRisk Index as dependent variables, with missing firm-level ESG and RepRisk data similarly replaced by industry-year averages. All specifications include advisor-year fixed effects and the control variables defined previously. Standard errors are clustered at the fund level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. t-statistics are reported in parentheses.

Similar to our main results, active management is associated with a lower incidence of compliance violations, smaller penalty amounts, and lower unscaled CO2 emissions. However, when industry-year average CO2 emissions are used to impute missing data, active management shows a positive correlation with Scope 2 and Scope 3 emissions intensity. This may occur because industry-average imputation likely inflates missing emissions data by substituting unreported values for smaller firms, typically characterized by lower emissions, with the generally higher average emissions of larger, more transparent firms within the same industry. This interpretation further suggests that actively managed funds may allocate capital to firms that do not publicly disclose Scope 2 and 3 emissions or instead report such data through private channels. Consequently, active managers may rely on their own internal estimations or proprietary information to evaluate these firms' environmental performance. These results, therefore, highlight the sensitivity of findings to assumptions regarding unreported CO2 emissions data and the approaches used for their estimation.

For the third-party sustainability scores, the results also appear to be sensitive to missing data.

Active management is no longer associated with higher E scores. Instead, it shows a negative relationship with both overall ESG and S scores. This may suggest that active funds do not strongly rely on third-party ESG scores, and that imputing missing values introduces bias into the estimation of their portfolio-level sustainability. However, the results for G scores and the reputational risk index remain robust, consistently demonstrating a negative association with active management in both cases.

Next, we explicitly test whether more actively managed funds are more exposed to firms that provide or omit sustainability disclosures. Specifically, we examine the relationship between active management and the share of firms within a fund’s portfolio that issue CSR reports as well as share of firms that follow GRI reporting standards.¹⁷ The results of these estimations are presented in Table 28 in appendix. Contrary to the concern that more actively managed funds may favor firms with less sustainability data due to their reliance on proprietary assessments, we find that active share is positively associated with the presence of CSR reporting within fund portfolios. However, when we interact active management with an ESG-oriented fund indicator, the results suggest that this relationship is primarily driven by ESG funds: the interaction term is positive and significant, while the standalone effect of active management for non-ESG funds becomes insignificant. Furthermore, we find that active management is positively associated with the share of firms reporting under GRI standards. These findings help mitigate concerns about disclosure bias in our results.

To address the concern that self-disclosed emissions data may differ from estimates provided by third-party vendors (see, Aswani et al., 2024), we estimate the relationship between active management and CO2 emissions using only data from firms that publish corporate social responsibility reports or follow GRI standards. The results are tabulated in Table 29. The negative associations between active management and CO2 emissions as well as emissions intensity hold when we restrict the sample to firms with more transparent disclosures: those issuing CSR reports in Panel A and those reporting under GRI standards in Panel B. This further supports that the increased active management is associated with lower emissions, even when relying solely on firms with verified sustainability disclosures. Notably, we observe a positive interaction between the ESG fund indicator and active management when examining emissions intensity among GRI-reporting firms. This suggests that ESG-oriented active funds exhibit higher portfolio-level emissions intensity compared to their non-ESG counterparts under the same advisor. While this does not contradict our earlier argument about activist strategies targeting poorly performing firms, it does indicate that both active and ESG-oriented active funds appear to respond to publicly available and more transparent sustainability information.

Overall, after accounting for the incompleteness of firm-level sustainability disclosures and potential disclosure bias, our main findings remain robust. Sensitivity tests indicate that the positive

¹⁷The Global Reporting Initiative (GRI) is an independent, not-for-profit organization that provides widely recognized guidelines for corporate sustainability reporting. According to KPMG (2024), GRI Standards are the most commonly adopted sustainability reporting framework worldwide: KPMG International, *The Move to Mandatory Reporting: Survey of Sustainability Reporting, 2024* - [KPMG](#).

relationship between active management and portfolio-level sustainability is not driven by limited data availability for smaller-cap firms. Notably, the evidence further supports the interpretation that active managers respond to publicly available and transparent sustainability information.

5.3 Engagement Funds

In this section, we examine whether engagement funds, that is, funds that actively engage with firms on corporate social responsibility issues, differ in portfolio sustainability from other ESG-oriented funds. Unlike other ESG strategies that may exclude firms following negative ESG events, engagement funds are less likely to divest after an incident, as their objective is to improve corporate practices through shareholder engagement (Lowry et al., 2023). As a result, these funds may hold portfolios with worse sustainability relative to other ESG funds.

ESG-engagement funds are identified based on the language used in their prospectuses. Specifically, if a fund states in its prospectus that it engages with portfolio companies on ESG-related issues and opportunities, we classify it as an ESG-engagement fund. Table 30 in the appendix presents extracts from the prospectuses of the identified engagement funds. Overall, only 17 out of the 180 ESG-oriented funds in our sample explicitly mention engagement activities in their prospectus disclosures. There are no passively managed engagement funds in our sample. The average active share among engagement funds is 0.81.

We compare the portfolio sustainability of ESG-engagement funds to that of other ESG-oriented funds managed by the same advisor. The results are presented in Table 14. Overall, we find no evidence that ESG-engagement funds hold portfolios with lower sustainability, as measured by our set of indicators, relative to other ESG funds from the same advisor. In contrast, we observe that ESG-engagement funds exhibit significantly lower Scope 1 CO₂ emissions and emissions intensity. Specifically, ESG-engagement funds hold portfolios with, on average, 8% lower log Scope 1 CO₂ emissions and 30% lower log Scope 1 CO₂ emissions intensity compared to other ESG funds managed by the same advisory firm.

6 Why Does Active Management Show Better Sustainability Outcomes?

So far, our findings indicate that higher levels of active management in mutual funds are associated with better sustainability performance among the firms held in their portfolios. Moreover, this relationship persists regardless of a fund’s ESG orientation. Even actively managed non-ESG funds tend to hold more responsible firms compared to their less active counterparts. This raises a natural question: what drives actively managed mutual funds to invest in more sustainable firms, even in the absence of an explicit ESG mandate?

Table 14: ESG-Engagement Funds and Portfolio Sustainability

PANEL A	Violations Indicator				log Amount of Penalties			
	Any (1)	Labor (2)	Environ. (3)	Consumer (4)	Any (5)	Labor (6)	Environ. (7)	Consumer (8)
Engagement Fund	-0.024 (-0.959)	-0.04 (-1.223)	-0.062*** (-2.67)	0.048** (1.968)	0.646 (1.394)	-0.044 (-0.07)	-0.159 (-0.197)	2.238** (2.287)
Adj. R ² Obs.	0.553 967	0.41 967	0.38 967	0.741 967	0.656 967	0.501 967	0.339 967	0.657 967
PANEL B	log CO2 Emissions			log CO2 Emissions to Sales				
	Scope 1 (1)	Scope 2 (2)	Scope 3 (3)	Scope 1 (4)	Scope 2 (5)	Scope 3 (6)		
Engagement Fund	-1.066** (-2.444)	-0.209 (-0.843)	-0.988 (-1.383)	-0.910** (-2.469)	-0.042 (-0.205)	-0.778* (-1.9)		
Adj. R ² Obs.	0.366 962	0.534 962	0.54 950	0.11 957	0.294 958	0.475 947		
PANEL C	ESG Scores (1)		E Scores (2)	S Scores (3)	G Scores (4)	RepRisk Index (5)		
Engagement Fund	-2.971 (-1.003)		-6.246 (-1.078)	-2.04 (-0.559)	-2.104 (-1.192)	-0.189 (-0.118)		
Adj. R ² Obs.	0.736 966		0.685 966	0.792 966	0.42 966	0.795 739		

This table presents the estimated impact of being an ESG-engagement fund on portfolio-level sustainability, compared to other ESG-oriented funds managed by the same advisors in the same years. The key independent variable is an indicator variable equal to 1 for funds identified as ESG-engagement funds. Panel A presents estimates related to portfolio-level compliance violations. Panel B reports estimates for portfolio-level CO2 emissions and emissions intensity. Panel C provides results for portfolio-level ESG scores and the RepRisk Index. All specifications include advisor-year fixed effects and control for active share, % of fund shares available to retail investors, % of sin stocks, % of oil/gas/coal stocks, and % technology stocks in the portfolio, as well as the log of fund TNA, log of fund age, annual return and return volatility, and the log of firm-level TNA. Standard errors are clustered at the fund level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. t-statistics are reported in parentheses.

6.1 Sustainability and Financial Performance

One possible explanation is that active managers are more likely to hold responsible stocks because they view ESG-related risks as financially material and incorporate ESG criteria to enhance financial performance (Lowry et al., 2023). While our main specification controls for financial performance through annual buy-and-hold returns, which are negatively correlated with the number of violations and emissions intensity, suggesting that holding a more responsible portfolio is indeed associated with higher returns, previous research highlight a trade-off between sustainability and financial outcomes (Berk and Van Binsbergen, 2025; Gantchev et al., 2024; Orlov et al., 2022; Riedl and Smeets, 2017). This literature implies that investors often sacrifice financial profits in favor of building more responsible portfolios. In the appendix, we examine the relationship between fund financial performance and portfolio-level sustainability using alternative performance measures: Carhart four-factor alphas and benchmark-adjusted returns.¹⁸ We generally find that better financial performance is associated with worse sustainability outcomes at the portfolio level, with the exception of ESG scores, which show a positive association with both four-factor alphas

¹⁸Details on the construction of benchmark-adjusted returns are presented in Table 18.

and benchmark-adjusted returns.¹⁹ These mixed findings suggest that the link between ESG and financial performance remains inconclusive.

Regarding the role of active management in generating sustainability and financial outcomes, Cremers et al. (2023) find that actively managed ESG strategies are associated with better financial performance, but only when fund managers explicitly specialize in ESG investing. While our main findings demonstrate a positive relationship between sustainability performance and active management, controlling for confounding factor of financial performance, it is possible that the relationship between sustainability and financial outcomes is not uniform across levels of active management. If actively managed funds aiming to enhance financial performance incorporate sustainability considerations to manage financially material ESG risks, this may help explain the observed link between active management and stronger portfolio-level sustainability.

In this section, we test this assumption by examining whether active management moderates the relationship between portfolio sustainability and fund financial performance. Specifically, we estimate models with interaction terms to compare the associations between annual buy-and-hold returns and a range of portfolio-level sustainability measures for highly active funds (active share ≥ 0.8) and other funds (active share < 0.8), within the same advisory firm and calendar year. The results are presented in Table 15. On average, for funds with below-median levels of active management, increases in the presence of any violation, labor violations, or environmental violations, columns (1)–(3) in Panel A, as well as in penalties related to labor and environmental violations, columns (6) and (7), are associated with lower returns. However, for the same funds, the incidence of consumer violations, column (4), total violation penalties, column (5), and penalties for consumer violations, column (8), are associated with higher returns. Overall, the relationship between compliance-related portfolio sustainability and financial performance appears inconclusive for the reference group of funds with below-median active share. The results for CO2 emissions and emissions intensity measures in Panel B also do not present a consistent pattern. Specifically, while increases in Scope 1 CO2 emissions and emissions intensity across all scopes are associated with lower returns, higher portfolio-level Scope 2 CO2 emissions are linked to higher returns. For the aggregated third-party sustainability scores reported in Panel C, funds with below-median active share exhibit a positive association between returns and higher ESG as well as S scores. However, increase in portfolio-level reputational risk is also associated with higher returns, while no significant relationships are observed for the E and G scores.

The moderating effect of active management is present, though it does not follow a consistent pattern. For all types of violations, except consumer violations, an increase in violation incidence is associated with a smaller decline in returns, as the coefficients on the interaction terms are positive, mitigating the negative relationships observed for less actively managed funds. A similar pattern holds for emissions intensity across all scopes. Overall, when comparing the relationship between

¹⁹The relationship between active management and portfolio-level sustainability remains robust when we use alternative measures of financial performance as control variables. Results are presented in Table 31.

sustainability and financial performance, it appears that for funds with above-median level of active management, the associations are often weaker relative to less active funds from the same advisor in the same year. The coefficients on the interaction terms generally move in the opposite direction and with comparable magnitude, offsetting the effects observed for less actively managed funds.

In Table 32 in the appendix, we report results using alternative measures of financial performance, including four-factor alphas and benchmark-adjusted returns. These results also appear inconclusive. For compliance-related violations, both alternative performance measures indicate that an increase in violations is associated with better financial performance for the reference group of less actively managed funds. However, the interaction terms for highly active funds from the same advisory firms tend to move in the opposite direction, mitigating these effects. A similar pattern is observed for Scope 2 and 3 CO2 emissions. In contrast, for emissions intensity, increased emissions are associated with lower performance among less actively managed funds, but this relationship is again offset for highly active funds, as indicated by the opposite-signed interaction terms. Overall, these results reinforce the conclusion that the moderating effect of active management on the relationship between sustainability and financial performance is present, but its direction lacks a clear and consistent pattern.

Taken together, these results provide no consistent evidence that actively managed funds align sustainability with financial performance. While active funds tend to hold more sustainable portfolios, the lack of a clear pattern in how sustainability relates to returns across active management levels suggests that this may not be driven by a systematic incorporation of ESG considerations as a tool for enhancing financial performance. The absence of a systematic alignment between ESG and financial performance among actively managed funds suggests that sustainability considerations may be incorporated for reasons other than expected return enhancement, such as reputational concerns or investor demand.

Table 15: Fund Returns and Portfolio Sustainability

PANEL A	Annual Buy-and-hold Returns							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Any violation (indicator)	-0.047*** (-4.543)							
Any violation (indicator)*Highly Active	0.025** (2.491)							
Labor violation (indicator)		-0.119*** (-11.303)						
Labor violation (indicator)*Highly Active		0.149*** (13.001)						
Env. violation (indicator)			-0.103*** (-8.201)					
Env. violation (indicator)*Highly Active			0.101*** (7.51)					
Cons. violation (indicator)				0.057*** (5.144)				
Cons. violation (indicator)*Highly Active				-0.096*** (-8.871)				
Any violation (log amount)					0.007*** (8.692)			
Any violation (log amount)*Highly Active					-0.006*** (-9.537)			
Labor violation (log amount)						-0.002*** (-2.842)		
Labor violation (log amount)*Highly Active						0.005*** (6.002)		
Env. violation (log amount)							-0.003*** (-4.817)	
Env. violation (log amount)*Highly Active							0.003*** (4.823)	
Cons. violation (log amount)								0.006*** (8.88)
Cons. violation (log amount)*Highly Active								-0.006*** (-9.448)
Adj. R ²	0.669	0.671	0.669	0.67	0.67	0.67	0.669	0.67
Obs.	16,529	16,529	16,529	16,529	16,529	16,529	16,529	16,529
PANEL B	(1)	(2)	(3)	(4)	(5)	(6)		
log Scope 1 CO2 Emissions	-0.004*** (-4.817)							
log Scope 1 CO2*Highly Active	0.002** (2.525)							
log Scope 2 CO2 Emissions		0.004*** (2.601)						
log Scope 2 CO2*Highly Active		-0.004** (-2.304)						
log Scope 3 CO2 Emissions			0.0004 (0.511)					
log Scope 3 CO2*Highly Active			-0.001 (-1.019)					
log Scope 1 Intensity				-0.012*** (-13.272)				
log Scope 1 Intensity*Highly Active				0.008*** (7.736)				
log Scope 2 Intensity					-0.029*** (-14.324)			
log Scope 2 Intensity*Highly Active					0.019*** (8.867)			
log Scope 3 Intensity							-0.009*** (-8.682)	
log Scope 3 Intensity*Highly Active							0.006*** (4.959)	
Adj. R ²	0.67	0.67	0.671	0.676	0.676			
Obs.	16,242	16,243	15,938	15,933	15,971			
PANEL C	(1)	(2)	(3)	(4)	(5)			
ESG Score	0.0003** (2.053)							
ESG Score*Highly Active	-0.0005*** (-3.82)							
E Score		0.000 (-0.441)						
E Score*Highly Active		-0.0003*** (-3.862)						
S Score			0.0005*** (2.845)					
S Score*Highly Active			-0.001*** (-5.704)					
G Score					0.0002 (0.935)			
G Score*Highly Active					0.0001 (0.536)			
RepRisk							0.002*** (7.73)	
RepRisk*Highly Active							-0.001*** (-6.665)	
Adj. R ²	0.669	0.669	0.669	0.669	0.669		0.594	
Obs.	16,483	16,483	16,483	16,483	16,483		12,908	

This table reports the estimated relationships between a fund's portfolio-level sustainability and its annual buy-and-hold returns, comparing these relationships between highly active funds and other funds managed by the same advisors in the same years. Panel A presents estimates related to portfolio-level compliance violations. Panel B reports estimates for portfolio-level CO2 emissions and emissions intensity. Panel C provides results for portfolio-level ESG scores and RepRisk Index. All specifications include advisor-year fixed effects. All specifications control for active share, % of fund shares available to retail investors, % of sin stocks, % of oil/gas/coal stocks, and % technology stocks in the portfolio, as well as the log of fund TNA, log of fund age, annual return and return volatility, and the log of firm-level TNA. Standard errors are clustered at the fund level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. t-statistics are reported in parentheses.

6.2 Sustainability and Investors Flows

Next, we examine investor flows as a potential explanation for why actively managed funds exhibit stronger portfolio-level sustainability. Even in the absence of an explicit ESG mandate, mutual fund managers may be incentivized to enhance the sustainability of their holdings if realized sustainability performance attracts greater investor inflows. Prior research has shown that ESG labels can attract capital (Baker et al., 2022; Hartzmark and Sussman, 2019). In this section, we assess whether realized sustainability performance, as measured by our portfolio-level indicators, is similarly associated with increased investor flows.

To investigate this relationship, we estimate the association between fund flows and a range of sustainability indicators. We account for the exogenous shock in investor attention to responsible investing that led to substantial inflows into ESG-oriented funds beginning in 2016.²⁰ To capture this shift, we include an interaction term with a post-2015 indicator variable, which equals one for 2016 and subsequent years.

In Table 16, we find no evidence of a positive relationship between portfolio-level sustainability and investor inflows. While heightened attention to sustainable investing appears to have shifted investor preferences toward more sustainable portfolios, this shift primarily served to mitigate previously observed adverse effects.²¹ Specifically, prior to 2016, increases in both overall violation incidence and labor-related violations were positively associated with fund inflows, columns (1) and (2) of Panel A. However, following 2016, these relationships are no longer statistically distinguishable from zero.²² A similar pattern is observed for the log of total penalties and the log of labor penalty amount in columns (5) and (6) of Panel A. Although the coefficients for both the main effect and the post-2015 interaction term are individually significant, their combined effect after 2015 is statistically indistinguishable from zero.²³

Panel B shows no statistically significant relationship between fund flows and portfolio-level sustainability measures related to CO2 emissions. In contrast, Panel C reveals that prior to 2016,

²⁰Hartzmark and Sussman (2019) find that the introduction of Morningstar’s Sustainability Rating in 2016 led to significant inflows to mutual funds identified as having high sustainability. Building on this shock, Lowry et al. (2023) show that the resulting increase in ownership by committed ESG funds led to meaningful improvements in firm-level ESG outcomes, including reductions in RRI scores and CO2 emissions. Similarly, Gantchev et al. (2024) document that mutual funds increased sustainability-oriented trades shortly after the ratings’ introduction in order to attract investor flows.

²¹In Table 33 in the appendix, we present results from a specification excluding the interaction term, which suggest similar conclusions. We find no consistent evidence of a relationship between portfolio-level sustainability indicators and fund flows. The estimates indicate that higher Scope 3 CO2 emissions are associated with lower investor inflows, while higher Scope 2 emissions intensity correlates with increased inflows. An increase in reputational risk corresponds to a decrease in investor inflows. No statistically significant associations are observed for other sustainability measures. Notably, the ESG fund label, which is based on the presence of ESG-related keywords in a fund’s name or prospectus, shows a strong positive impact on fund investor flows across the whole sample period. This suggests that investor inflows respond more strongly to ESG labels or marketing signals than to the actual sustainability outcomes of mutual fund portfolios.

²²For the overall violation indicator and its interaction with the post-2015 dummy, the Wald test statistic is 0.138 (p-value = 0.71). For the labor violation indicator, the Wald test statistic is 0.707 (p-value = 0.4).

²³Wald test statistics for the joint effect are 0.271 (p-value = 0.60) for total penalties and 0.013 (p-value = 0.90) for labor-specific penalties.

portfolio-level ESG scores were positively associated with investor inflows: higher overall ESG scores, as well as higher environmental and social sub-scores, corresponded to greater fund flows. However, these relationships disappear after 2016, as indicated by negative interaction coefficients on the interaction with post-2015 dummy. Interestingly, reputational risk becomes negatively associated with investor flows in the post-2015 period, with increases in the RepRisk Index linked to reduced inflows. Furthermore, the ESG fund indicator in column (6) of Panel C shows that, after 2016, funds labeled as ESG attracted significantly greater inflows. Specifically, ESG-labeled funds received investor flows that were, on average, 0.012 higher (equivalent to four times the sample mean) relative to non-ESG funds offered by the same advisory firm.

Overall, while we do not find evidence that realized portfolio-level sustainability is directly rewarded with increased investor flows, the results of this section suggest that fund managers may still be incentivized to improve the sustainability of their portfolios. This incentive arises not from positive reinforcement, but from the fact that poor sustainability performance is no longer tolerated by investors to the extent it may have been prior to 2016. Although increased attention to responsible investing appears to have mitigated some previously adverse capital allocation patterns, a misalignment between actual sustainability outcomes and investor flows remains. Moreover, flows responded more strongly to marketing signals, such as ESG-related terms in a fund name, than to the fund's realized sustainability outcomes, as reflected in measures based on the ESG behavior of its portfolio firms. Overall, the findings of this section offer limited support for flow-based incentives as an explanation for why actively managed funds tend to exhibit stronger portfolio-level sustainability.

Table 16: Fund Flows and Portfolio Sustainability after 2015

PANEL A	Flows							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Any viol. (indicator) $_{t-1}$	0.011** (2.387)							
Any viol. (indicator) $_{t-1}$ *Post2015	-0.010** (-2.32)							
Labor viol. (indicator) $_{t-1}$		0.012** (2.061)						
Labor viol. (indicator) $_{t-1}$ *Post2015		-0.014** (-2.433)						
Environ. viol. (indicator) $_{t-1}$			0.004 (0.663)					
Environ. viol. (indicator) $_{t-1}$ *Post2015			-0.005 (-0.908)					
Cons. viol. (indicator) $_{t-1}$				-0.00001 (-0.002)				
Cons. viol. (indicator) $_{t-1}$ *Post2015				-0.002 (-0.355)				
Any viol. (log amount) $_{t-1}$					0.001** (1.964)			
Any viol. (log amount) $_{t-1}$ *Post2015					-0.001* (-1.69)			
Labor viol. (log amount) $_{t-1}$						0.001*** (2.714)		
Labor viol. (log amount) $_{t-1}$ *Post2015						-0.001*** (-2.626)		
Environ. viol. (log amount) $_{t-1}$							0.00002 (0.103)	
Environ. viol. (log amount) $_{t-1}$ *Post2015							0.0001 (0.441)	
Cons. viol. (log amount) $_{t-1}$								0.0001 (0.332)
Cons. viol. (log amount) $_{t-1}$ *Post2015								-0.0001 (-0.493)
Adj. R ²	0.106	0.107	0.106	0.106	0.106	0.106	0.106	0.106
Obs.	13,566	13,566	13,566	13,566	13,566	13,566	13,566	13,566
PANEL B	(1)	(2)	(3)	(4)	(5)	(6)		
log Scope 1 CO2 Emissions $_{t-1}$	-0.0002 (-0.525)							
log Scope 1 CO2 $_{t-1}$ *Post2015	0.0002 (0.35)							
log Scope 2 CO2 Emissions $_{t-1}$		0.0001 (0.122)						
log Scope 2 CO2 $_{t-1}$ *Post2015		-0.0003 (-0.321)						
log Scope 3 CO2 Emissions $_{t-1}$			-0.0002 (-0.5)					
log Scope 3 CO2 $_{t-1}$ *Post2015			-0.001 (-1.514)					
log Scope 1 Intensity $_{t-1}$				-0.0002 (-0.363)				
log Scope 1 Intensity $_{t-1}$ *Post2015				0.0003 (0.678)				
log Scope 2 Intensity $_{t-1}$					0.0003 (0.239)			
log Scope 2 Intensity $_{t-1}$ *Post2015					0.001 (1.098)			
log Scope 3 Intensity $_{t-1}$							0.0005 (0.916)	
log Scope 3 Intensity $_{t-1}$ *Post2015							-0.001 (-1.386)	
Adj. R ²	0.107	0.107	0.108	0.107	0.109		0.108	
Obs.	13,307	13,307	13,034	13,071	13,107		12,919	
PANEL B	(1)	(2)	(3)	(4)	(5)	(6)		
ESG scores $_{t-1}$	0.0002** (2.361)							
ESG scores $_{t-1}$ *Post2015	-0.0002*** (-2.7)							
E scores $_{t-1}$		0.0002*** (3.499)						
E scores $_{t-1}$ *Post2015		-0.0002*** (-3.13)						
S scores $_{t-1}$			0.0002** (2.238)					
S scores $_{t-1}$ *Post2015			-0.0002** (-2.421)					
G scores $_{t-1}$				0.0001 (0.983)				
G scores $_{t-1}$ *Post2015				-0.0002* (-1.903)				
RepRisk Index $_{t-1}$					-0.00003 (-0.234)			
RepRisk $_{t-1}$ *Post2015					-0.0002** (-2.371)			
ESG fund								-0.003 (-1.33)
ESG*Post2015								0.012*** (4.528)
Adj. R ²	0.107	0.107	0.107	0.107	0.11		0.132	
Obs.	13,527	13,527	13,527	13,527	12,101		16,215	

This table reports the estimated relationships between a fund's portfolio-level sustainability and its investor flows. Panel A presents estimates related to portfolio-level compliance violations. Panel B reports estimates for portfolio-level CO2 emissions and emissions intensity. Panel C provides results for portfolio-level ESG scores, RepRisk Index and ESG fund indicator. All specifications include advisor-year fixed effects. All specifications control for active share, % of fund shares available to retail investors, % of sin stocks, % of oil/gas/coal stocks, and % technology stocks in the portfolio, as well as the log of fund TNA, log of fund age, annual return and return volatility, and the log of firm-level TNA. Standard errors are clustered at the fund level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. t-statistics are reported in parentheses.

6.3 Sustainability and Management Fees

Another channel through which fund managers may be rewarded for better portfolio-level sustainability is management fees. If managers can use strong sustainability performance as a signal of managerial skill, regardless of a fund’s explicit ESG orientation, they may be able to justify and command higher fees. In this sense, the ESG performance of firms within a fund’s portfolio may serve as a signal of managerial skill, with the avoidance of ESG controversies acting as a visible indicator of superior stock-selection capabilities. As previously noted, most of our sustainability measures are based on publicly available information, making them observable to investors. Consequently, investors can readily observe violations or high carbon emissions among firms in a fund’s portfolio, and the presence of such issues may be perceived as indication of poor management skill in selecting less controversial and more responsible investments. This may motivate not only ESG-oriented mutual fund managers but also those without an explicit ESG focus to pursue improved sustainability outcomes.

We test the relationship between portfolio-level sustainability measures and management fees, with the results presented in Table 17. We find that a one standard deviation increase in the incidence of any violation is associated with a 3% decrease in the management fee, column (1) of Panel A. Additionally, a one standard deviation increase in the log of the total amount of penalties corresponds to a 5% decrease in the management fee, Column (5) of Panel A. Management fees also appear to be sensitive to portfolio-level emissions intensity, as indicated by negative coefficients for Scope 1 and Scope 3 emissions intensity in columns (4) and (6) of Panel B, respectively. Besides that, fees are negatively associated with portfolio-level ESG scores, suggesting that funds holding firms with better third-party ESG ratings do not charge higher fees. However, as previously discussed, the credibility of such ratings as indicators of truly responsible firms has been questioned. Therefore, reliance on these scores may be perceived as a lack of proprietary research into genuinely responsible investments, and as a result, is not rewarded through higher management fees. We do not find significant relationships for other sustainability measures, such as violation incidence by type, labor and environmental fines, Scope 1 and 2 CO₂ emissions, and Scope 2 emissions intensity. While these findings do not support the assumption that funds exhibiting stronger sustainability performance can command higher fees, the absence of significant associations may also imply that mutual fund investors allocate their limited attention unevenly across different ESG dimensions and controversies, focusing primarily on the most salient issues.

In contrast to our findings for fund flows, we find that an ESG label is not associated with higher management fees. Management fees can be viewed as a form of self-assessed managerial skill. Unlike investor flows, which rely on external perceptions and often fail to reward funds with stronger portfolio-level sustainability due to information asymmetries, management fees are set by fund managers. This indicates a signaling mechanism whereby managers demonstrate their superior skills with the portfolio’s sustainability outcomes, which is also reflected in higher fees. In this sense, the absence of a strong link between sustainability and fund flows may reflect an adverse

selection problem, where outside investors struggle to distinguish competent managers due to the limited visibility of the quality of stock selection research done by them. However, sustainability-related performance appears to be partially internalized through fees, suggesting that fund managers recognize and attempt to signal their expertise in constructing responsible portfolios.

Table 17: Management Fees and Portfolio Sustainability

PANEL A	Management Fee							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Any violation (indicator) $_{t-1}$	-0.052** (-2.359)							
Labor violation (indicator) $_{t-1}$		-0.022 (-0.976)						
Environ. violation (indicator) $_{t-1}$			-0.02 (-0.775)					
Cons. violation (indicator) $_{t-1}$				-0.046* (-1.837)				
Any violation (log amount) $_{t-1}$					-0.005*** (-3.598)			
Labor violation (log amount) $_{t-1}$						-0.001 (-1.105)		
Environ. violation (log amount) $_{t-1}$							-0.001 (-0.835)	
Cons. violation (log amount) $_{t-1}$								-0.003*** (-4.073)
Adj. R ²	0.549	0.549	0.549	0.549	0.55	0.549	0.549	0.55
Obs.	13,680	13,680	13,680	13,680	13,680	13,680	13,680	13,680
PANEL B	Management Fee							
	(1)	(2)	(3)	(4)	(5)	(6)		
log Scope 1 CO2 Emissions $_{t-1}$	-0.003 (-1.42)							
log Scope 2 CO2 Emissions $_{t-1}$		0.003 (0.791)						
log Scope 3 CO2 Emissions $_{t-1}$			-0.004** (-2.201)					
log Scope 1 Intensity $_{t-1}$				-0.005** (-2.101)				
log Scope 2 Intensity $_{t-1}$					-0.006 (-1.331)			
log Scope 3 Intensity $_{t-1}$								-0.006*** (-2.852)
Adj. R ²	0.55	0.549	0.551	0.551	0.55	0.555		
Obs.	13,418	13,418	13,144	13,182	13,218	13,029		
PANEL C	Management Fee							
	(1)	(2)	(3)	(4)	(5)	(6)		
ESG scores $_{t-1}$	-0.002*** (-3.848)							
E scores $_{t-1}$		-0.002*** (-4.581)						
S scores $_{t-1}$			-0.002*** (-4.768)					
G scores $_{t-1}$				-0.001* (-1.831)				
RepRisk Index $_{t-1}$					0.002*** (2.59)			
ESG fund								-0.014 (-0.734)
Adj. R ²	0.551	0.552	0.551	0.549	0.556	0.53		
Obs.	13,641	13,641	13,641	13,641	12,210	16,529		

This table reports the estimated relationships between a fund's portfolio-level sustainability and its management fees. Panel A presents estimates related to portfolio-level compliance violations. Panel B reports estimates for portfolio-level CO2 emissions and emissions intensity. Panel C provides results for portfolio-level ESG scores, RepRisk Index and ESG fund indicator. All specifications include advisor-year fixed effects. All specifications control for active share, % of fund shares available to retail investors, % of sin stocks, % of oil/gas/coal stocks, and % technology stocks in the portfolio, as well as the log of fund TNA, log of fund age, annual return and return volatility, and the log of firm-level TNA. Standard errors are clustered at the fund level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. t-statistics are reported in parentheses.

7 Conclusion

Controversies in which mutual funds committed to sustainable investing fail to deliver on their promises continue to appear. One potential driver of such behavior can be the lack of stock-selection skills among fund managers, who must identify genuinely sustainable firms despite ambiguous ESG information. This paper investigates the role of active stock selection in shaping sustainability outcomes within mutual fund portfolios, examining whether a higher degree of active management is associated with stronger or weaker portfolio-level sustainability.

Using the approach developed by Cremers and Petajisto (2009) to measure active management, we find that a higher degree of active management is associated with improved portfolio-level sustainability outcomes. Actively managed funds exhibit a lower incidence of ESG-related violations, reduced penalty amounts, lower CO2 emissions and emissions intensity across all scopes, and decreased reputational risk compared to less actively managed funds offered by the same advisor company.

Specifically, a one-standard-deviation increase in active management is associated with a 6% reduction in overall violations, a 13% decrease in labor violations, a 6% reduction in environmental violations, and a 13% decrease in consumer-related violations. In terms of penalties for corresponding violations, the same increase in active management corresponds to a 4.5% reduction in the log amount of total penalties, an 11% decrease in log labor-related penalties, a 15% decrease in log environmental penalties, and a 10.7% reduction in log amount of fines related to consumer protection violations. Additionally, deviation from the market portfolio is linked to lower carbon emissions: a 3.6% decrease in log Scope 1 CO2 emissions, a 1.4% decrease in Scope 2, and a 2.5% decrease in Scope 3 emissions as well as a 12% reduction in Scope 1 emissions intensity, 3% in Scope 2, and 7% in Scope 3. Furthermore, portfolios of more actively managed funds show a 7% reduction in reputational risk at the portfolio level. However, there appears to be a misalignment between ESG labeling and active stock selection, as highly active ESG funds exhibit weaker sustainability outcomes compared to actively managed non-ESG funds under the same advisor company.

Among the potential motivations for active managers to improve portfolio-level sustainability, we examine three key factors: financial performance, investor capital flows, and management fees. While we find no evidence that actively managed funds successfully align ESG performance with financial returns, nor that more sustainable portfolios attract greater investor flows, our analysis reveals that stronger performance on certain sustainability dimensions is associated with higher management fees. This suggests that managers may use portfolio sustainability outcomes as a signal of their stock-selection skills, which is reflected in the fees they charge.

Our findings offer actionable insights for mutual fund investors seeking to meet ESG goals. Portfolios of actively managed funds are connected to better sustainability outcomes across a broad range of measures. In this sense, investing in actively managed funds may serve as an effective approach to support responsible firms and align with responsible investing preferences. Overall,

the results suggest that the value of active management may lie in its ability to deliver better sustainability performance compared to passive strategies replicating the market portfolio. More actively managed funds tend to hold stocks with fewer compliance violations, lower carbon footprints, and lower reputational risks, underscoring the role of active stock selection in achieving stronger portfolio sustainability outcomes.

An interesting perspective for future research is exploring the motivations behind the selection of more responsible stocks, even within actively managed non-ESG portfolios. Our results indicate that active management enhances sustainability across all funds, regardless of an explicit ESG focus. This suggests that even managers of non-ESG funds may view ESG-related risks as material and therefore avoid including less responsible firms in their portfolios. Understanding these behavioral and strategic considerations could provide valuable insights into how ESG principles are internalized across the broader asset management industry, beyond explicitly labeled ESG products.

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8 Appendix

Table 18: Variables Definitions

Variable Name	Definition
PANEL A: FUNDS' CHARACTERISTICS	
Active Share	The measure of fund's active management relative to 20 market cap. indexes, calculated following (Cremers and Petajisto, 2009). The active share of fund f in year y is defined as: $AS_{ft} = \frac{1}{2} \sum_{i=1}^N w_{fjt} - w_{bjt} $, where b denotes a benchmark.
Active Share ESG	The measure of fund's active management relative to 20 market cap. indexes and 7 ESG-screened indexes, calculated following (Cremers and Petajisto, 2009). The active share of fund f in year y is defined as: $AS_{ft} = \frac{1}{2} \sum_{i=1}^N w_{fjt} - w_{bjt} $, where b denotes a benchmark.
log Fund TNA	Natural logarithm of a fund's year-average total net assets reported in millions \$.
log Fund Age	Natural logarithm of a fund's age, measured in years since its inception, as determined by the oldest share class.
log Firm TNA	Natural logarithm of value-weighted average of total net assets of the firms held in a fund's portfolio.
log Firm Sales	Natural logarithm of value-weighted average of gross sales of the firms held in a fund's portfolio.
% available to retail	Asset-weighted average of a fund's share classes available to retail investors.
% sin stocks	Asset-weighted average of sin stocks within a fund's portfolio, where sin stocks are defined following Hong and Kacperczyk, 2009.
% oil, gas, coal stocks	Asset-weighted average of oil, gas, and coal stocks within a fund's portfolio, where these stocks are identified by two-digit SIC codes 12 and 13.
% technology stocks	Asset-weighted average of technology stocks within a fund's portfolio. Following Heckler, 2005, technology stocks are identified by the following NAICS codes: 3254, 5417, 3345, 3341, 3344, 3342, 5112, 5415, 3332, 3335, 3346, 3364, 3329, and 3324.
Annual return	Fund's annual buy-and-hold returns.
Annual return volatility	Standard deviation of buy-and-hold returns of a fund.
Fama-French-Carhart four-factor alpha	Fund's annual alpha, estimated using Fama-French-Carhart four-factor model on a rolling-window between month t-36 to t-1.
Benchmark-adjusted return	Fund's annual return in excess of its empirical benchmark return, where the benchmark is the market index that yields the lowest active share for the fund, as defined by the methodology of (Cremers and Petajisto, 2009).
Flows	Fund's investor flows, calculated as $Flows_{ft} = \frac{TNA_{ft} - TNA_{ft-1} \times (1 + R_{ft})}{TNA_{ft-1}}$.
Management fee	Management fee divided by the average net assets, in percentage, as reported by CRSP.
PANEL B: PORTFOLIO-LEVEL SUSTAINABILITY INDICATORS	
Any violation (indicator)	Asset-weighted average across firms in a fund's portfolio of a dummy variable equal to 1 if firm had at least one compliance violation in a year, and 0 otherwise.
Environmental violation (indicator)	Asset-weighted average across firms in a fund's portfolio of a dummy variable equal to 1 if firm had at least one environment-related violation in a year, and 0 otherwise.

Continued

Variable Name	Definition
Labor violation (indicator)	Asset-weighted average across firms in a fund's portfolio of a dummy variable equal to 1 if firm had at least one employment or workplace safety-related violation in a year, and 0 otherwise.
Consumer violation (indicator)	Asset-weighted average across firms in a fund's portfolio of a dummy variable equal to 1 if firm had at least one competition or consumer protection-related violation in a year, and 0 otherwise.
Any violation (log amount)	Natural logarithm of asset-weighted average of total firm-year dollar amount of fines assessed for compliance violations.
Environmental violation (log amount)	Natural logarithm of asset-weighted average of total firm-year dollar amount of fines assessed for environment-related violations.
Labor violation (log amount)	Natural logarithm of asset-weighted average of total firm-year dollar amount of fines assessed for employment or workplace safety-related violations.
Consumer violation (log amount)	Natural logarithm of asset-weighted average of total firm-year dollar amount of fines assessed for competition or consumer protection-related violations.
log CO2 Scope 1	Natural logarithm of asset-weighted average of direct CO2 and CO2 equivalent emissions in tons. Direct emissions refer to those produced from sources that are owned or controlled by the company.
log CO2 Scope 2	Natural logarithm of asset-weighted average of indirect CO2 and CO2 equivalent emissions in tons. Indirect emissions refer to those resulting from the consumption of purchased electricity, heat, or steam, which occur at the facility where electricity, heat, or steam are generated.
log CO2 Scope 3	Natural logarithm of asset-weighted average of CO2 and CO2 equivalent emissions in tons from contractor-owned vehicles, employee business travel, waste disposal, outsourced activities, product consumption by customers, production of purchased materials, and electricity purchased for resale.
CO2 Scope 1 to Sales	Asset-weighted average of total estimated scope 1 CO2 emissions in tons divided by firm gross sales in millions of US dollars.
CO2 Scope 2 to Sales	Asset-weighted average of total estimated scope 2 CO2 emissions in tons divided by firm gross sales in millions of US dollars.
CO2 Scope 3 to Sales	Asset-weighted average of total estimated scope 3 CO2 emissions in tons divided by firm gross sales in millions of US dollars.
ESG score	Asset-weighted average of firm-level ESG score from LSEG (formerly Refinitiv/Asset4) database, measured on a scale from 0 to 100.
E score	Asset-weighted average of firm-level environmental pillar score from LSEG (formerly Refinitiv/Asset4) database, measured on a scale from 0 to 100.
S score	Asset-weighted average of firm-level social pillar score from LSEG (formerly Refinitiv/Asset4) database, measured on a scale from 0 to 100.
G score	Asset-weighted average of firm-level governance pillar score from LSEG (formerly Refinitiv/Asset4) database, measured on a scale from 0 to 100.
RepRisk Index	Asset-weighted average of firm-level reputational risk index, measured on a scale from 0 to 100, as reported by RepRisk.
Coverage rate	Asset-weighted average across firms in a fund's portfolio of a dummy variable equal to 1 if a firm-level sustainability indicator is available, and 0 otherwise. This measure reflects the proportion of firms within the fund's portfolio that provide sustainability data, weighted by the size of each firm's contribution to the fund's total assets.

Continued	
Variable Name	Definition
CSR Reporting	Asset-weighted average of a firm-level indicator variable that equals 1 if the company issues a corporate social responsibility report, and 0 otherwise.
GRI Guidelines	Asset-weighted average of a firm-level indicator variable equal to 1 if the company reports in accordance with GRI guidelines, and 0 otherwise.
Continued	

Table 19: ESG-oriented Funds over Time

Year	Number of ESG-oriented funds	Assets held (million\$)
2011	51	16,806
2012	48	17,078
2013	51	19,872
2014	56	21,679
2015	58	23,921
2016	61	24,368
2017	61	24,841
2018	87	33,010
2019	95	46,851
2020	111	81,975
2021	140	161,352
2022	150	149,758

This table reports the total number of ESG funds identified each year as well as the cumulative total net assets held by them.

Table 20: Offences Examples

Violation Type	Offence Group	Offence Description
Labor Violation	Employment-related offences	<i>The Justice Department reached a settlement with X and its corporate affiliates and subsidiaries resolving allegations that the company discriminated against immigrant employees.</i>
	Safety-related offences	<i>Failure to report certain death and injury incidents. 49 CFR 579.21(b). Failure to report customer satisfaction campaigns, special warranty extensions, and warranty claims. 49 CFR 579.21(c).</i>
Environmental Violation	Environment-related offences	<i>Settlement with X to assess contamination and address safety hazards at four abandoned uranium mines in the Mariano Lake and Smith Lake areas on the Navajo Nation. EPA and Navajo Nation will oversee the work totaling about \$500,000.</i>
Consumer Violation	Competition-related offences	<i>X agreed to plead guilty and to pay a \$21.1 million criminal fine for its participation in a series of conspiracies to rig bids and fix prices for the sale of optical disk drives.</i>
	Consumer-protection-related offences	<i>A group of defendants settled Federal Trade Commission charges that they knowingly provided scammers with hundreds of thousands of consumers' sensitive personal information, including Social Security and bank account numbers.</i>
Other Violation	Financial offences	<i>X agreed to pay an \$896,000 civil penalty to settle charges that it violated premerger reporting and waiting requirements when it acquired voting securities of Y.</i>
	Government-contracting-related offences	<i>X agreed to pay the United States \$19.875 million to settle allegations that the X improperly charged the U.S. Department of Health and Human Services for salary and administrative costs on hundreds of federal grants.</i>
	Healthcare-related offences	<i>Settlement of a civil money penalty action relating to the distribution of unapproved medical devices.</i>
	Miscellaneous offences	<i>The Securities and Exchange Commission announced that X settled alleged pay-to-play violations involving undisclosed campaign contributions to Y while Y was a candidate for governor.</i>

The table presents examples of offences categorized by violation type. To maintain confidentiality, the names of the violating companies have been omitted.

Table 21: Violation Tracker Penalties Amount over Time

Year	All Violations		Labor Violations		Environmental Violations		Consumer Violations		Other Violations	
	N.	Penalty (m.\$)	N.	Penalty (m.\$)	N.	Penalty (m.\$)	N.	Penalty (m.\$)	N.	Penalty (m.\$)
2011	26,260	25,235.6	21,321	3,492.3	3,362	2,673.8	1,313	9,518.7	806	9,550.8
2012	24,289	81,968	19,408	2,358.7	3,217	15,340.8	1,263	42,667.2	910	21,601.3
2013	23,573	83,844.6	18,609	9,304.4	3,232	4,967.1	1,283	17,923.9	1,011	51,649.2
2014	24,386	91,668.9	19,333	6,826.6	31,16	1,828.9	1,416	39,043.9	1,086	43,969.4
2015	25,674	95,389.7	19,599	8,484.7	30,00	35,080.8	1,463	25,842.4	2,203	25,981.8
2016	27,223	81,606.3	20,671	3,426.2	31,48	34,748.6	1,479	23,613.5	2,539	19,817.9
2017	29,652	74,942	23,778	9,478	2,854	14,558.7	1,267	22,950.6	2,324	27,954.8
2018	30,359	57,020.4	23,525	5,333.2	2,812	4,358.6	1,297	25,162.6	3,282	22,166
2019	29,506	59,892	22,278	5,232.6	2,937	4,052.8	1,469	33,471.5	3,427	17,135.1
2020	23,021	88,849.1	15,252	30,477.2	2,692	3,982.2	1,417	40,524.9	4,165	13,864.9
2021	26,327	75,680.2	17,896	7,460.2	2,517	13,624.1	1,512	19,091.8	4,894	35,504.1
2022	28,670	85,485.5	20,424	5,730.6	2,426	4,010.1	1,593	26,302.5	4,771	49,442.3

This table displays the total number of companies listed in the Violation Tracker database, along with the cumulative penalties imposed on them, categorized by violation offence type and year.

Table 22: Matching between CRSP Mutual Funds Holdings, Violation Tracker, LSEG ESG and RepRisk

Year	CRSP Mutual Funds	Violation Tracker	LSEG CO2 S1	LSEG CO2 S2	LSEG CO2 S3	LSEG ESG Scores	LSEG E Scores	LSEG S Scores	LSEG G Scores	Rep Risk
2011	3,747	1,974	75	71	39	245	244	244	245	0
2012	3,694	1,971	277	272	177	663	662	662	663	1,224
2013	3,751	1,999	332	324	208	933	933	933	933	1,272
2014	4,093	2,054	334	325	201	940	940	940	940	1,348
2015	4,193	2,056	408	396	240	1,514	1,514	1,514	1,514	1,399
2016	4,168	2,031	473	447	279	2,160	2,160	2,160	2,160	1,433
2017	4,134	2,007	551	528	313	2,645	2,645	2,645	2,645	1,491
2018	4,247	1,986	695	667	377	2,813	2,813	2,813	2,813	1,548
2019	4,109	1,941	990	950	547	3,034	3,034	3,034	3,034	1,584
2020	4,293	1,955	1,175	1,144	646	3,239	3,239	3,239	3,239	1,627
2021	4,898	1,984	1,327	1,302	740	3,239	3,239	3,239	3,239	1,689
2022	4779	1,928	546	544	320	1,316	1,316	1,316	1,316	0
Total	7,699	2,785	1,643	1,607	982	4,279	4,278	4,278	4279	1,777

This table presents the number of unique matched companies per year across the CRSP Mutual Funds Holdings, Violation Tracker, LSEG ESG, and RepRisk databases.

Table 23: Pearson Correlations

	Active Share	log Firm TNA	log Firm Sales	log Fund TNA	log Fund Age	% retail investors	% sin stocks	% oil, gas, coal stocks	% tech. stocks	Annual returns	Annual volatility	Any viol. (indicator)	Labor viol. (indicator)	Environ. viol. (indicator)	Cons. viol. (indicator)	Any viol. (log amount)	Labor viol. (log amount)
log Firm TNA	-0.155	1															
log Firm Sales	-0.281	0.902	1														
log Fund TNA	-0.257	0.165	0.162	1													
log Fund Age	-0.035	0.047	0.072	0.369	1												
% available to retail investors	0.063	0.081	0.081	0.118	0.303	1											
% sin stocks	-0.045	0.148	0.199	0.016	0	0.02	1										
% oil, gas, coal stocks	0.087	-0.029	0	-0.038	0.024	0.024	-0.06	1									
% tech. stocks	-0.096	-0.033	0.07	0.047	0.051	0.035	-0.075	-0.205	1								
Annual buy-and-hold returns	-0.076	0	0.031	0.029	0.019	0	0	-0.078	0.069	1							
Annual returns volatility	0.051	-0.171	-0.155	-0.03	0.061	-0.069	-0.12	0.124	0.032	-0.27	1						
Any viol. (indicator)	-0.207	0.622	0.669	0.09	0.067	0.079	0.161	0.153	-0.134	0	-0.17	1					
Labor viol. (indicator)	-0.253	0.409	0.538	0.05	0.065	0.06	0.182	0.112	-0.137	-0.048	-0.139	0.834	1				
Environ. viol. (indicator)	-0.065	0.309	0.378	0	0	0.053	0.128	0.408	-0.236	-0.023	-0.138	0.691	0.681	1			
Consumer viol. (indicator)	-0.272	0.773	0.741	0.16	0.083	0.059	0.145	-0.152	0.031	0.044	-0.145	0.666	0.414	0.175	1		
Any viol. (log amount)	-0.307	0.664	0.69	0.144	0.089	0.093	0.124	0	0.107	0.053	-0.162	0.711	0.511	0.337	0.698	1	
Labor viol. (log amount)	-0.392	0.436	0.552	0.101	0.105	0.087	0.141	0	0.057	0.072	-0.13	0.649	0.683	0.38	0.471	0.703	1
Environ. viol. (log amount)	-0.351	0.348	0.466	0.09	0.063	0.077	0.12	0.191	-0.112	0	-0.155	0.647	0.64	0.644	0.307	0.565	0.636
Consumer viol. (log amount)	-0.368	0.596	0.625	0.149	0.085	0.085	0.134	-0.169	0.079	0.062	-0.194	0.535	0.37	0.158	0.712	0.81	0.577
log CO2 Scope 1	-0.259	0.338	0.423	0.076	0	0.044	0.139	0.245	-0.184	0.075	-0.229	0.583	0.584	0.647	0.235	0.433	0.474
log CO2 Scope 2	-0.216	0.623	0.69	0.096	0	0.054	0.157	0.115	-0.116	0.057	-0.183	0.599	0.546	0.516	0.499	0.536	0.444
log CO2 Scope 3	-0.241	0.514	0.578	0.102	0.023	0	0.116	0.1	-0.068	0.073	-0.108	0.492	0.451	0.411	0.391	0.466	0.425
log CO2 S1 over Sales	-0.194	-0.095	-0.036	0	-0.022	0	0.044	0.238	-0.23	0.022	-0.141	0.277	0.349	0.475	-0.141	0.089	0.234
log CO2 S2 over Sales	-0.038	-0.289	-0.277	-0.054	-0.076	-0.038	0	0.144	-0.266	0	-0.051	-0.033	0.059	0.247	-0.315	-0.187	-0.106
log CO2 S3 over Sales	-0.198	0.063	0.11	0.049	0	-0.08	0.035	0.135	-0.183	0.032	0.021	0.2	0.242	0.296	0	0.082	0.184
ESG score	-0.138	0.761	0.71	0.176	0.058	0	0.11	-0.067	0	0	-0.053	0.565	0.435	0.301	0.612	0.527	0.416
E score	-0.096	0.784	0.711	0.158	0.039	0	0.125	-0.03	-0.063	0	-0.073	0.599	0.451	0.353	0.616	0.534	0.404
S score	-0.134	0.756	0.707	0.188	0.057	0	0.093	-0.126	0.082	0	-0.028	0.499	0.359	0.204	0.62	0.507	0.367
G score	-0.159	0.563	0.524	0.135	0.072	0	0.068	0.055	-0.089	0	-0.046	0.524	0.451	0.364	0.441	0.433	0.414
RepRisk Index	-0.261	0.824	0.851	0.15	0.059	0.085	0.239	0.057	0.037	0.046	-0.149	0.694	0.567	0.452	0.754	0.696	0.553
Viol. coverage	-0.273	0.581	0.675	0.078	0.072	0.08	0.168	0.123	-0.049	0.093	-0.208	0.709	0.665	0.538	0.502	0.618	0.661
CO2 S1 coverage	-0.136	0.584	0.544	0.142	0.042	0	0.081	-0.031	-0.044	0.304	-0.111	0.441	0.321	0.251	0.491	0.415	0.328
CO2 S2 coverage	-0.139	0.591	0.551	0.146	0.043	0	0.086	-0.057	-0.029	0.305	-0.108	0.43	0.308	0.223	0.498	0.416	0.323
CO2 S3 coverage	-0.169	0.681	0.631	0.165	0.04	0	0.097	-0.121	0	0.275	-0.131	0.449	0.294	0.16	0.609	0.49	0.35
ESG Scores coverage	-0.115	0.206	0.185	0.081	0.035	0	0	-0.047	-0.034	0.407	-0.22	0.156	0.12	0.061	0.203	0.181	0.162
	Environ. viol. (log amount)	Cons. viol. (log amount)	log CO2 Scope 1	log CO2 Scope 2	log CO2 Scope 3	log CO2 S1 over Sales	log CO2 S2 over Sales	log CO2 S3 over Sales	ESG score	E score	S score	G score	RepRisk Index	Viol. coverage	CO2 S1 coverage	CO2 S2 coverage	CO2 S3 coverage
Consumer viol. (log amount)	0.432	1															
logCO2 Scope 1	0.658	0.326	1														
logCO2 Scope 2	0.491	0.451	0.686	1													
logCO2 Scope 3	0.475	0.393	0.609	0.645	1												
log CO2 Scope 1 over Sales	0.488	0.031	0.809	0.291	0.278	1											
log CO2 Scope 2 over Sales	0.115	-0.182	0.369	0.295	0.022	0.595	1										
log CO2 Scope 3 over Sales	0.324	0.069	0.491	0.288	0.732	0.489	0.318	1									
ESG score	0.335	0.445	0.36	0.574	0.605	0	-0.184	0.294	1								
E score	0.354	0.438	0.398	0.609	0.599	0.033	-0.144	0.271	0.967	1							
S score	0.263	0.442	0.269	0.525	0.566	-0.1	-0.268	0.242	0.968	0.93	1						
G score	0.376	0.341	0.416	0.486	0.534	0.183	0	0.359	0.855	0.781	0.726	1					
RepRisk Index	0.453	0.561	0.47	0.73	0.584	0	-0.233	0.099	0.712	0.724	0.698	0.554	1				
Viol. coverage	0.608	0.534	0.53	0.584	0.509	0.219	-0.062	0.181	0.546	0.56	0.472	0.524	0.638	1			
CO2 S1 coverage	0.267	0.367	0.399	0.525	0.599	0.102	-0.056	0.376	0.758	0.752	0.737	0.626	0.639	0.474	1		
CO2 S2 coverage	0.253	0.372	0.374	0.515	0.586	0.071	-0.08	0.353	0.764	0.755	0.749	0.62	0.642	0.465	0.997	1	
CO2 S3 coverage	0.238	0.458	0.33	0.538	0.555	-0.02	-0.182	0.248	0.781	0.773	0.783	0.594	0.704	0.477	0.942	0.949	1
ESG Scores coverage	0.114	0.203	0.254	0.254	0.367	0.13	0.055	0.292	0.296	0.269	0.282	0.29	0.34	0.26	0.733	0.725	0.636

This table reports the pairwise Pearson correlation coefficients between the variables used in the study. All reported correlations are statistically significant at the 5% level. Coefficients equal to 0 indicate that the Pearson correlation is not statistically significant.

Table 24: ESG Funds and Portfolio Level Compliance Violations

	Violations Indicator								Log Amount of Penalties							
	Any		Labor		Environ.		Consumer		Any		Labor		Environ.		Consumer	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
ESG fund	0.046*** (4.282)	0.028*** (3.475)	0.044*** (4.598)	0.035*** (3.587)	0.011 (1.514)	0.004 (0.527)	-0.002 (-0.166)	-0.021*** (-3.452)	0.103 (0.419)	-0.188 (-1.361)	0.464** (2.264)	0.264* (1.645)	0.513** (2.117)	0.326 (1.457)	-0.692 (-1.409)	-1.053*** (-3.02)
% available to retail	0.001 (0.115)	-0.007 (-0.878)	-0.005 (-0.447)	-0.009 (-0.999)	-0.005 (-0.596)	-0.008 (-1.035)	0.003 (0.26)	-0.007 (-1.221)	0.146 (0.902)	-0.007 (-0.07)	0.171 (1.01)	0.066 (0.45)	0.022 (0.109)	-0.07 (-0.369)	0.313 (1.306)	0.114 (0.661)
% sin stocks	0.725*** (2.923)	0.319** (2.504)	0.763*** (2.616)	0.535** (2.359)	0.387** (1.983)	0.238 (1.534)	0.593*** (5.837)	0.152** (2.119)	9.91*** (3.272)	2.886*** (3.158)	12.724*** (3.399)	8.003*** (3.468)	11.018** (2.094)	6.692* (1.681)	14.372*** (3.838)	5.316*** (4.061)
% oil/gas/coal stocks	0.468*** (12.992)	0.299*** (10.018)	0.264*** (6.638)	0.170*** (4.394)	0.685*** (13.138)	0.625*** (12.29)	-0.065*** (-2.842)	-0.248*** (-10.981)	4.172*** (8.274)	1.292*** (3.446)	2.705*** (5.311)	0.757 (1.592)	11.04*** (13.46)	9.303*** (11.645)	-2.215*** (-2.687)	-5.938*** (-7.871)
% tech. stocks	-0.088*** (-3.496)	-0.108*** (-4.366)	-0.106*** (-4.469)	-0.117*** (-4.841)	-0.125*** (-6.895)	-0.132*** (-6.867)	0.048** (2.397)	0.028* (1.879)	2.853*** (7.19)	2.517*** (7.917)	1.524*** (2.828)	1.297*** (2.586)	-1.49*** (-2.61)	-1.736*** (-3.127)	2.601*** (3.783)	2.165*** (3.851)
log Fund TNA	0.004 (1.557)	-0.003* (-1.827)	0.0001 (0.033)	-0.004* (-1.894)	-0.002 (-1.015)	-0.004*** (-2.685)	0.007*** (3.446)	-0.0003 (-0.232)	0.128*** (3.672)	0.006 (0.244)	0.047 (1.137)	-0.035 (-0.917)	0.114** (2.406)	0.04 (0.886)	0.17*** (3.455)	0.011 (0.298)
log Fund Age	0.02*** (4.306)	0.018*** (5.092)	0.02*** (4.687)	0.019*** (4.749)	0.009*** (2.64)	0.008** (2.54)	0.013*** (3.082)	0.011*** (4.486)	0.217*** (3.018)	0.179*** (3.893)	0.369*** (4.622)	0.345*** (4.847)	0.214** (2.309)	0.189** (2.158)	0.311*** (2.998)	0.255*** (3.365)
Annual return	-0.06*** (-3.684)	-0.021 (-1.477)	0.02* (1.722)	0.05*** (3.251)	-0.033*** (-2.843)	-0.019* (-1.702)	-0.027** (-2.046)	0.016 (1.511)	0.225 (0.817)	0.909*** (3.828)	2.372*** (6.654)	2.824*** (7.855)	0.777** (2.062)	1.195*** (3.215)	0.64 (1.494)	1.532*** (4.153)
Return volatility	-18.21*** (-14.543)	-1.687 (-1.592)	-10.78*** (-8.731)	-1.556 (-1.343)	-11.28*** (-12.3)	-5.199*** (-5.747)	-16.38*** (-18.496)	1.484** (2.249)	-287.46*** (-14.378)	-4.696 (-0.269)	-210.5*** (-9.706)	-20.65 (-0.979)	-292.6*** (-11.352)	-119.7*** (-4.333)	-485.79*** (-14.276)	-123.8*** (-3.848)
log Firm TNA		0.087*** (5.229)		0.049*** (26.316)		0.032*** (20.786)		0.095*** (76.893)		1.503*** (50.3)		1.013*** (27.291)		0.911*** (17.85)		1.929*** (40.292)
Adj. R ²	0.148	0.455	0.119	0.245	0.292	0.365	0.162	0.634	0.138	0.484	0.104	0.242	0.153	0.231	0.183	0.425
FE	adv-year	adv-year	adv-year	adv-year	adv-year	adv-year	adv-year	adv-year	adv-year	adv-year	adv-year	adv-year	adv-year	adv-year	adv-year	adv-year
Obs.	16,554	16,529	16,554	16,529	16,554	16,529	16,554	16,539	16,554	16,529	16,554	16,529	16,554	16,529	16,554	16,529

This table presents the estimated impact of being an ESG fund on portfolio-level compliance violations, compared to non-ESG funds managed by the same advisors in the same years. The key independent variable is an indicator variable equal to 1 for funds identified as ESG funds. In columns (1)-(8), the dependent variables represent the portfolio-level weighted average of indicator for firm-level violations, where each indicator equals 1 if a firm within the portfolio committed a violation in a given year. In columns (9)-(16), the dependent variables are the natural logarithms of portfolio-level weighted average of the penalty amounts associated with committed violations. 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.

Table 25: ESG Funds and Portfolio Level CO2 Emissions

	log CO2 Emissions						log CO2 Emissions to Sales					
	Scope 1		Scope 2		Scope 3		Scope 1		Scope 2		Scope 3	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
ESG fund	-0.155 (-1.375)	-0.219** (-2.088)	0.182** (2.459)	0.103* (1.886)	0.306*** (2.621)	0.221** (2.189)	-0.195* (-1.734)	-0.169 (-1.473)	-0.006 (-0.102)	0.021 (0.396)	0.195** (2.431)	0.195** (2.424)
% available to retail	0.015 (0.153)	-0.016 (-0.172)	0.03 (0.518)	-0.014 (-0.322)	-0.027 (-0.27)	-0.072 (-0.89)	-0.046 (-0.456)	-0.025 (-0.253)	-0.046 (-1.127)	-0.027 (-0.743)	-0.106 (-1.514)	-0.104 (-1.495)
% sin stocks	5.102** (2.439)	3.492** (2.118)	4.252*** (3.579)	1.992*** (3.37)	7.319*** (2.832)	4.516** (2.551)	0.14 (0.149)	1.097 (0.921)	-0.524 (-1.408)	0.317 (1.099)	2.942** (2.221)	3.052** (2.206)
% oil/gas/coal stocks	6.421*** (13.759)	5.817*** (12.608)	2.537*** (9.023)	1.66*** (6.494)	5.422*** (11.199)	4.296*** (9.248)	4.586*** (11.532)	4.951*** (11.826)	0.493** (2.271)	0.804*** (3.49)	3.676*** (9.476)	3.716*** (9.263)
% tech. stocks	-0.977*** (-4.07)	-1.054*** (-4.349)	-0.308** (-2.21)	-0.403*** (-3.203)	0.406** (2.002)	0.26 (1.389)	-1.690*** (-6.769)	-1.65*** (-6.671)	-1.225*** (-10.344)	-1.181*** (-10.098)	-0.779*** (-4.921)	-0.779*** (-4.882)
log Fund TNA	-0.004 (-0.097)	0.03 (1.398)	0.005 (0.195)	-0.0003 (-0.025)	0.018 (0.459)	-0.003 (-0.166)	0.027 (1.24)	0.043** (2.002)	0.002 (0.256)	0.016** (2.026)	0.008 (0.577)	0.01 (0.699)
log Fund Age	0.057*** (2.616)	-0.007 (-0.183)	0.038*** (2.954)	-0.001 (-0.049)	0.045** (2.275)	0.01 (0.292)	-0.039 (-0.892)	-0.037 (-0.878)	-0.050*** (-2.775)	-0.049*** (-2.958)	-0.023 (-0.784)	-0.025 (-0.832)
Annual return	-0.134 (-0.971)	0.015 (0.112)	0.024 (0.265)	0.229*** (3.072)	0.065 (0.419)	0.332** (2.215)	-0.727*** (-5.136)	-0.817*** (-5.609)	-0.453*** (-6.755)	-0.534*** (-7.7)	-0.327** (-2.552)	-0.333** (-2.575)
Return volatility	-183.5*** (-16.013)	-119.7*** (-9.701)	-106.6*** (-14.697)	-15.99** (-2.553)	-181.7*** (-17.365)	-67.73*** (-7.064)	-100.6*** (-8.781)	-137.6*** (-10.825)	4.992 (0.923)	-27.21*** (-4.799)	-64.71*** (-8.394)	-69.42*** (-8.081)
log Firm TNA		0.343*** (14.482)		0.487*** (40.14)		0.622*** (29.918)		-0.207*** (-9.023)		-0.179*** (-19.482)		-0.026 (-1.523)
Adj. R ²	0.236	0.292	0.167	0.455	0.251	0.417	0.171	0.194	0.166	0.242	0.252	0.252
FE	adv-year	adv-year	adv-year	adv-year	adv-year	adv-year	adv-year	adv-year	adv-year	adv-year	adv-year	adv-year
Obs.	16,267	16,242	16,268	16,243	15,962	15,938	15,958	15,933	15,996	15,971	15,835	15,812

This table presents the estimated impact of being an ESG fund on portfolio-level CO2 emissions and emissions intensity, compared to non-ESG funds managed by the same advisors in the same years. The key independent variable is an indicator variable equal to 1 for funds identified as ESG funds. In columns (1)-(6), the dependent variables represent the natural logarithm of weighted average CO2 emissions for firms in the portfolio for Scope 1-3 emissions, respectively. In columns (7)-(12), the dependent variables represent the weighted average of CO2 emissions to Sales for firms in the portfolio for Scope 1-3 emissions, respectively. 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.

Table 26: ESG Funds and Portfolio Level Sustainability Scores

	ESG Score		E Score		S Score		G Score		RepRisk Index	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
ESG fund	4.575*** (6.704)	3.407*** (6.895)	7.784*** (8.515)	6.051*** (7.688)	4.73*** (6.573)	3.505*** (8.284)	1.931*** (3.124)	1.254** (2.266)	0.705 (0.895)	-0.161 (-0.431)
% available to retail	0.336 (0.511)	-0.246 (-0.635)	0.22 (0.228)	-0.643 (-1.161)	0.348 (0.525)	-0.262 (-0.737)	0.28 (0.555)	-0.055 (-0.139)	0.316 (0.478)	-0.38 (-1.134)
% sin stocks	41.6*** (2.656)	13.52* (1.781)	61.39*** (3.1)	19.79** (2.51)	40.84** (2.341)	11.32 (1.267)	18.877** (2.139)	2.725 (0.594)	60.06** (3.425)	32.37*** (3.541)
% oil/gas/coal stocks	15.439*** (7.852)	4.139** (2.476)	25.69*** (9.023)	9.014*** (3.665)	10.28*** (5.453)	-1.625 (-1.013)	17.226*** (9.901)	10.75*** (7.108)	21.14*** (9.893)	7.706*** (4.898)
% tech. stocks	5.896*** (4.87)	4.684*** (4.881)	1.1 (0.597)	-0.682 (-0.464)	11.41*** (10.028)	10.12*** (11.245)	-1.267 (-1.105)	-1.947* (-1.868)	5.323*** (4.67)	3.927*** (4.491)
log Fund TNA	0.7*** (4.94)	0.211** (2.531)	0.943*** (4.556)	0.220* (1.869)	0.814*** (5.697)	0.299*** (3.955)	0.356*** (3.315)	0.074 (0.86)	0.499*** (3.604)	0.097 (1.324)
log Fund Age	0.221 (0.794)	0.079 (0.476)	0.302 (0.738)	0.098 (0.401)	0.077 (0.274)	-0.073 (-0.485)	0.447** (2.065)	0.364** (2.097)	0.398 (1.453)	0.159 (1.032)
Annual return	-2.708*** (-3.234)	-0.085 (-0.144)	-7.077*** (-5.903)	-3.213*** (-3.89)	-3.068*** (-3.589)	-0.311 (-0.545)	0.637 (0.845)	2.151*** (3.24)	5.256*** (5.512)	4.061*** (6.566)
Return volatility	-1400.7*** (-16.015)	-267.5*** (-3.954)	-2144.3*** (-16.999)	-467.04*** (-4.811)	-1437*** (-16.916)	-244.3*** (-4.004)	-741.8*** (-10.343)	-90.2 (-1.353)	-1022.3*** (-10.767)	211.2*** (3.206)
log Firm TNA		6.043*** (77.621)		8.945*** (82.597)		6.354*** (82.578)		3.483*** (44.89)		5.753*** (74.061)
Adj. R ²	0.337	0.718	0.315	0.725	0.387	0.761	0.19	0.407	0.184	0.727
FE	adv-year	adv-year	adv-year	adv-year	adv-year	adv-year	adv-year	adv-year	adv-year	adv-year
Obs.	16,508	16,483	16,508	16,483	16,508	16,483	16,508	16,483	12,928	12,908

This table presents the estimated impact of being an ESG fund on portfolio-level ESG Scores and RepRisk Index, compared to non-ESG funds managed by the same advisors in the same years. The key independent variable is an indicator variable equal to 1 for funds identified as ESG funds. All specifications include advisor-year fixed effects. 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.

Table 27: Active Management and CO2 Emissions to firm TNA

	log CO2 Emissions to TNA					
	Scope 1		Scope 2		Scope 3	
	(1)	(2)	(3)	(4)	(5)	(6)
Active Share	-1.654*** (-16.697)	-1.671*** (-16.536)	-0.663*** (-13.023)	-0.682*** (-13.167)	-1.573*** (-19.128)	-1.589*** (-18.985)
ESG fund		-0.492*** (-2.596)		-0.277*** (-2.934)		0.05 (0.284)
Active Share*ESG fund		0.501 (1.558)		0.447*** (2.581)		0.242 (0.907)
% available to retail	0.032 (0.324)	0.037 (0.378)	-0.018 (-0.374)	-0.017 (-0.364)	-0.04 (-0.545)	-0.044 (-0.607)
% sin stocks	2.348* (1.69)	2.318* (1.672)	2.089*** (2.941)	2.119*** (2.963)	3.598** (2.219)	3.685** (2.245)
% oil/gas/coal stocks	4.992*** (11.541)	4.992*** (11.535)	1.146*** (4.227)	1.156*** (4.265)	3.677*** (8.694)	3.695*** (8.718)
% tech. stocks	-1.308*** (-5.117)	-1.304*** (-5.115)	-0.689*** (-4.29)	-0.695*** (-4.349)	-0.279 (-1.467)	-0.293 (-1.549)
log Fund TNA	-0.028 (-1.37)	-0.03 (-1.452)	-0.013 (-1.309)	-0.013 (-1.292)	-0.046*** (-2.929)	-0.045*** (-2.811)
log Fund Age	0.008 (0.213)	0.002 (0.051)	-0.03 (-1.486)	-0.029 (-1.446)	-0.018 (-0.608)	-0.011 (-0.34)
Annual return	-0.624*** (-4.429)	-0.620*** (-4.407)	-0.116 (-1.443)	-0.114 (-1.42)	-0.184 (-1.381)	-0.186 (-1.4)
Return volatility	-91.68*** (-7.392)	-91.74*** (-7.395)	-16.48** (-2.446)	-16.35** (-2.432)	-47.84*** (-5.096)	-47.56*** (-5.085)
log Firm Sales	-0.155*** (-6.831)	-0.152*** (-6.666)	-0.166*** (-13.723)	-0.165*** (-13.534)	0.063*** (3.23)	0.062*** (3.179)
Adj. R ²	0.194	0.195	0.17	0.171	0.273	0.274
FE	adv-year	adv-year	adv-year	adv-year	adv-year	adv-year
Obs.	16,177	16,177	16,172	16,172	15,818	15,818

This table reports the estimated relationships between a fund's active management and its portfolio-level emissions intensity defined as CO2 emissions to firm total net assets. The key independent variable is active share, which measures the level of active management by quantifying the similarity between a fund's holdings and the constituents of market indexes, following the methodology of Cremers and Petajisto (2009). The dependent variables represent the natural logarithm of weighted average of CO2 emissions to TNA for firms in the portfolio for Scope 1-3 emissions. 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.

Table 28: Active Management and Firms' Sustainability Reporting

	CSR Reporting		GRI Guidelines	
	(1)	(2)	(3)	(4)
Active Share	0.021** (2.146)	0.016 (1.644)	0.003** (2.407)	0.004** (2.429)
ESG fund		0.008 (0.454)		0.006** (1.968)
ESG fund*Active Share		0.088*** (2.841)		-0.005 (-1.021)
% available to retail	-0.002 (-0.27)	-0.004 (-0.465)	-0.001 (-0.265)	-0.001 (-0.306)
% sin stocks	0.361** (2.519)	0.387*** (2.635)	0.002 (0.145)	0.003 (0.186)
% oil/gas/coal stocks	0.196*** (5.807)	0.201*** (5.95)	0.009 (1.14)	0.009 (1.143)
% tech. stocks	0.03 (1.402)	0.024 (1.158)	-0.006*** (-1.616)	-0.006 (-1.641)
log Fund TNA	0.002 (1.329)	0.003* (1.711)	0.001*** (3.806)	0.001*** (3.877)
log Fund Age	-0.003 (-0.731)	-0.0001 (-0.032)	-0.002** (-2.353)	-0.002** (-2.181)
Annual return	-0.01 (-0.775)	-0.011 (-0.8)	0.007** (2.316)	0.007** (2.293)
Return volatility	-2.204 (-1.554)	-2.078 (-1.474)	-0.472** (-2.275)	-0.470** (-2.264)
log Firm TNA	0.112*** (58.093)	0.112*** (58.707)	0.001 (1.466)	0.001 (1.378)
Adj. R ²	0.655	0.659	0.459	0.459
FE	adv-year	adv-year	adv-year	adv-year
Obs.	16,483	16,483	16,143	16,143

This table presents the estimated relationship between a fund's level of active management and the share of firms in its portfolio that provide corporate sustainability reporting. The key independent variable is active share, which measures the level of active management by quantifying the similarity between a fund's holdings and the constituents of market indexes, following the methodology of Cremers and Petajisto (2009). In columns (1)–(2), the dependent variable is the portfolio-weighted average of a firm-level indicator equal to 1 if the company issues a CSR report, and 0 otherwise. Columns (3)–(4) use as the dependent variable the weighted average of a firm-level indicator equal to 1 if the company reports in accordance with GRI guidelines, and 0 otherwise. 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.

Table 29: Active Management and Firms' Sustainability under CSR and GRI Disclosure

PANEL A	log CO2 Emissions						log Emissions to Sales						ESG Scores		E Scores		S Scores		G Scores	
	Scope 1		Scope 2		Scope 3		Scope 1		Scope 2		Scope 3		(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)								
Active Share	-1.703*** (-16.372)	-1.727*** (-16.304)	-0.715*** (-12.089)	-0.719*** (-11.959)	-1.450*** (-15.989)	-1.504*** (-16.303)	-1.562*** (-15.019)	-1.573*** (-14.895)	-0.294*** (-7.02)	-0.304*** (-7.158)	-1.166*** (-16.117)	-1.185*** (-16.106)	1.501*** (5.602)	1.504*** (5.482)	3.486*** (7.891)	3.312*** (7.351)	3.379*** (12.578)	3.405*** (12.285)	-2.242*** (-5.644)	-2.116*** (-5.232)
ESG fund		-0.636*** (-3.126)		0.05 (0.48)		-0.533*** (-2.971)		-0.382* (-1.765)		-0.177** (-2.076)		-0.052 (-0.329)		1.802*** (2.859)		-0.078 (-0.094)		2.611*** (4.273)		1.984** (2.351)
ESG fund*AS		0.614* (1.841)		0.06 (0.341)		1.145*** (3.548)		0.314 (0.855)		0.227 (1.422)		0.362 (1.388)		-0.548 (-0.519)		3.284** (2.229)		-1.215 (-1.388)		-2.909* (-1.899)
Adj. R ²	0.331	0.332	0.455	0.455	0.421	0.423	0.236	0.236	0.249	0.249	0.274	0.275	0.63	0.631	0.587	0.589	0.675	0.677	0.207	0.208
Obs.	16,145	16,145	16,144	16,144	15,774	15,774	15,831	15,831	15,886	15,886	15,583	15,583	16,306	16,306	16,306	16,306	16,306	16,306	16,306	16,306

PANEL B	log CO2 Emissions						log Emissions to Sales						ESG Scores		E Scores		S Scores		G Scores	
	Scope 1		Scope 2		Scope 3		Scope 1		Scope 2		Scope 3		(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)								
Active Share	-1.521*** (-14.424)	-1.553*** (-14.481)	-0.697*** (-11.654)	-0.702*** (-11.57)	-1.372*** (-15.499)	-1.426*** (-15.864)	-1.423*** (-14.216)	-1.455*** (-14.292)	-0.237*** (-5.683)	-0.251*** (-5.967)	-1.066*** (-14.8)	-1.096*** (-14.971)	0.941*** (3.676)	0.965*** (3.688)	3.746*** (8.333)	3.649*** (7.947)	2.939*** (11.25)	2.925*** (10.876)	-2.992*** (-8.186)	-2.837*** (-7.641)
ESG fund		-0.649*** (-3.15)		0.017 (0.154)		-0.488*** (-2.712)		-0.566*** (-2.863)		-0.203** (-2.219)		-0.169 (-1.134)		1.616*** (2.87)		0.176 (0.225)		1.605*** (2.892)		2.173*** (2.649)
ESG fund*AS		0.787** (2.332)		0.103 (0.543)		1.156*** (3.567)		0.754** (2.259)		0.327* (1.918)		0.627** (2.523)		-0.886 (-0.904)		1.773 (1.279)		-0.176 (-0.203)		-3.512** (-2.408)
Adj. R ²	0.326	0.326	0.448	0.448	0.405	0.407	0.221	0.221	0.247	0.247	0.267	0.269	0.566	0.567	0.5	0.501	0.602	0.603	0.175	0.176
Obs.	16,027	16,027	16,027	16,027	15,586	15,586	15,861	15,861	15,856	15,856	15,348	15,348	16,112	16,112	16,112	16,112	16,112	16,112	16,112	16,112

This table presents the estimated relationship between a fund's level of active management and portfolio-level sustainability. PANEL A reports results where the dependent variables are the weighted averages of firm-level sustainability indicators: CO2 emissions (columns (1)–(6)), CO2 emissions to sales (columns (7)–(12)), and ESG scores (columns (13)–(20)), calculated for firms in the fund's portfolio that issue corporate social responsibility (CSR) reports. PANEL B presents analogous results, but restricts the sample to firms within each fund's portfolio that report using the Global Reporting Initiative (GRI) standards. All specifications control for the percentage of fund shares available to retail investors, the percentage of sin stocks, oil/gas/coal stocks, and technology stocks in the portfolio, as well as the logarithm of fund TNA, logarithm of fund age, annual return, return volatility, and the logarithm of firm-level TNA. All specifications include advisor-year fixed effects. 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.

Table 30: Engagement Funds Prospectuses Information

N.	Fund Name	Prospectus Information
1-2.	LKCM Aquinas Catholic Equity Fund, LKCM Aquinas Growth Fund	<i>The Adviser monitors companies selected for the Fund for policies on various issues contemplated by the Catholic Guidelines. If the Fund invests in a company whose policies and practices are inconsistent with the Catholic Guidelines, the Adviser may attempt to influence the company or sell the company's securities or otherwise exclude future investments in such company.</i>
3.	BNY Mellon Sustainable US Equity Portfolio	<i>In addition to investing in companies that Newton believes are "sustainable" after applying the fundamental analysis and ESG quality review rating, Newton may invest in companies where it believes it can promote sustainable business practices through ongoing company engagement and active proxy voting consistent with Newton's investment and engagement priorities.</i>
4.	Calvert VP SRI Strategic Portfolio	<i>The Portfolio may invest in companies which have yet to make significant progress on such issues but have the potential to do so. Enhanced engagement will encourage selected companies in the portfolio to address issues where sufficient commitment is lacking, or reinforce progress that may be underway.</i>
5-6.	Calvert Small Cap Fund, Calvert Focused Value Fund	<i>The Fund may also invest in issuers that the investment adviser believes are likely to operate in accordance with the Principles pending the investment adviser's engagement activity with such issuer.</i>
7.	Goldman Sachs US Equity ESG Fund	<i>The Investment Adviser may engage in active dialogues with company management teams to further inform investment decision-making and to foster best corporate governance practices using its fundamental and ESG analysis.</i>
8.	Brown Advisory Sustainable Growth Fund	<i>The Adviser pursues active, strategic engagement with companies and other stakeholders in an effort to enhance due diligence and monitor ESG risks and sustainable opportunities that may impact the investment thesis.</i>
9.	ClearBridge Sustainability Leaders Fund	<i>It is also the subadviser's intention to engage and encourage management to improve in certain ESG areas identified by the subadviser.</i>
10-11.	John Hancock ESG Large Cap Core Fund, John Hancock ESG All Cap Core Fund	<i>The manager employs active shareowner engagement to raise environmental, social, and governance issues with the management of select portfolio companies, and may file shareholder proposals on behalf of the fund. Through this effort, the manager seeks to encourage company managements toward greater transparency, accountability, disclosure, and commitment to ESG issues.</i>
12.	Goldman Sachs ESG Emerging Markets Equity Fund	<i>The Investment Adviser may engage in active dialogues with company management teams to further inform investment decision-making and to foster best corporate governance practices using its fundamental and ESG analysis.</i>
13.	UBS Engage For Impact Fund	<i>The Advisor seeks to invest in companies which have a clearly identified potential for additional positive impact that the Advisor intends to drive through engagement with the companies.</i>
14.	Coho Relative Value ESG Fund	<i>the Adviser also meets regularly with management of its portfolio and prospective portfolio companies, as well as their competitors, customers and suppliers. Engagement and proactive dialogue on key ESG issues are also important aspects of the research process.</i>
15.	T Rowe Price Global Impact Equity Fund	<i>T.Rowe Price relies primarily on proprietary analysis incorporating company-provided data, direct engagement with companies and their management.</i>
16.	Brown Advisory Sustainable Small-Cap Core Fund	<i>The ESG team may also engage the issuer or relevant stakeholders of the issuer to gain a deeper understanding of a risk, promote improved risk management, and/or provide insight on potential opportunities.</i>
17.	Boston Partners Global Sustainability Fund	<i>The Sustainability Team also engages with issuers regarding sustainability deficiencies and reviews any improvements by issuers annually.</i>

The table presents examples from the prospectuses of funds identified as engagement funds, i.e. funds that attempt to promote sustainability practices in the companies they invest in.

Table 31: Portfolio Sustainability and Mutual Fund Financial Performance

PANEL A.1		Violations Indicator							
		Any		Labor		Environ.		Cons.	
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
4F alpha		2.926*** (3.162)		4.164*** (4.765)		1.604** (2.101)		3.68*** (6.688)	
Bm-adj. return			0.149** (2.111)		0.491*** (6.944)		0.208*** (3.824)		-0.079 (-1.449)
Active Share		-0.106*** (-10.228)	-0.115*** (-11.636)	-0.152*** (-13.298)	-0.161*** (-14.683)	-0.034*** (-3.793)	-0.040*** (-4.625)	-0.090*** (-14.181)	-0.101*** (-16.077)
Adj. R ²		0.467	0.474	0.287	0.299	0.347	0.37	0.667	0.653
Obs.		13,486	16,529	13,486	16,529	13,486	16,529	13,486	16,529

PANEL A.2		log Amount of Penalties							
		Any		Labor		Environ.		Cons.	
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
4F alpha		31.49** (2.484)		95.49*** (6.445)		26.01 (1.387)		65.23*** (3.463)	
Bm-adj. return			2.781** (2.439)		14.77*** (9.597)		7.091*** (4.152)		0.705 (0.39)
Active Share		-2.458*** (-17.153)	-2.552*** (-19.323)	-4.550*** (-21.13)	-4.611*** (-22.691)	-5.325*** (-21.882)	-5.302*** (-23.289)	-4.746*** (-21.923)	-5.069*** (-24.064)
Adj. R ²		0.519	0.52	0.353	0.353	0.319	0.329	0.49	0.484
Obs.		13,486	16,529	13,486	16,529	13,486	16,529	13,486	16,529

PANEL B		log CO2 Emissions						log CO2 Emissions to Sales					
		Scope 1		Scope 2		Scope 3		Scope 1		Scope 2		Scope 3	
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
4F alpha		-0.577 (-0.058)		30.84*** (5.318)		14.74* (1.791)		-20.8* (-1.939)		-0.351 (-0.069)		4.926 (0.633)	
Bm-adj. return			0.951 (1.373)		0.269 (0.694)		2.597*** (3.748)		-0.788 (-1.05)		-1.425*** (-3.969)		0.068 (0.111)
Active Share		-1.676*** (-15.268)	-1.684*** (-16.671)	-0.604*** (-10.176)	-0.647*** (-11.427)	-1.267*** (-14.898)	-1.326*** (-15.967)	-1.631*** (-14.473)	-1.602*** (-15.666)	-0.328*** (-6.991)	-0.329*** (-7.912)	-1.212*** (-15.702)	-1.213*** (-16.697)
Adj. R ²		0.319	0.343	0.488	0.473	0.407	0.446	0.236	0.24	0.252	0.248	0.265	0.289
Obs.		13,334	16,242	13,339	16,243	13,151	15,938	13,049	15,933	13,088	15,971	13,044	15,812

PANEL C		ESG Scores		E Scores		S Scores		G Scores		RepRisk Index	
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
4F alpha		89.94** (2.371)		90.32 (1.516)		60.71 (1.619)		132.9*** (3.43)		140.1*** (4.053)	
Bm-adj. return			9.245*** (3.005)		9.373** (2.123)		4.215 (1.407)		17.46*** (5.075)		-0.762 (-0.25)
Active Share		-0.109 (-0.223)	-0.279 (-0.63)	2.517*** (3.836)	2.277*** (3.756)	0.908** (2.001)	0.462 (1.14)	-3.206*** (-6.333)	-2.985*** (-6.475)	-5.178*** (-11.419)	-5.274*** (-11.649)
Adj. R ²		0.722	0.716	0.731	0.721	0.769	0.758	0.41	0.413	0.748	0.741
Obs.		13,474	16,483	13,474	16,483	13,474	16,483	13,474	16,483	11,001	12,908

This table reports the estimated relationships between a fund's financial performance and its portfolio-level sustainability. The 4F alpha is defined as a fund's annual alpha, estimated using the Fama-French-Carhart four-factor model on a rolling window from month $t-36$ to $t-1$. The BM-adjusted return is defined as the fund's return in excess of its empirical benchmark return, where the benchmark is the one that yields the lowest active share for the fund. Panel A presents estimates related to portfolio-level compliance violations incidence (Panel A.1) and log amount of penalties (Panel A.2). Panel B reports estimates for portfolio-level CO2 emissions and emissions intensity. Panel C provides results for portfolio-level ESG scores and the RepRisk Index. All specifications include advisor-year fixed effects. All specifications control for active share, % of fund shares available to retail investors, % of sin stocks, % oil/gas/coal stocks, and % technology stocks in the portfolio, as well as the logarithm of fund TNA, logarithm of fund age, return volatility, and the logarithm of firm-level TNA. Standard errors are clustered at the fund level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. t-statistics are reported in parentheses.

Table 32: Fund Returns and Portfolio Sustainability across Levels of Active Management: Alternative Fin. Performance Measures

PANEL A		Four-Factor Alpha							Benchmark-Adjusted Return								
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Any viol. (indicator)		0.002*** (4.143)								0.005*** (2.602)							
Any viol. (indicator)*Highly Active		-0.001** (-2.566)								-0.003 (-1.54)							
Labor viol. (indicator)			0.002*** (3.45)								0.002 (0.887)						
Labor viol. (indicator)*Highly Active			-0.0003 (-0.501)								0.01*** (3.987)						
Env. viol. (indicator)				0.001* (1.795)								0.007*** (2.961)					
Env. viol. (indicator)*Highly Active				-0.0002 (-0.301)								-0.001 (-0.342)					
Cons. viol. (indicator)					0.004*** (8.392)								0.002 (0.753)				
Cons. viol. (indicator)*Highly Active					-0.002*** (-4.585)								-0.009*** (-3.619)				
Any viol. (log amount)						0.0002*** (6.993)								0.001*** (5.224)			
Any viol. (log amount)*Highly Active						-0.0002*** (-6.618)								-0.001*** (-4.666)			
Labor viol. (log amount)							0.0001*** (4.499)								0.0005*** (2.87)		
Labor viol. (log amount)*Highly Active							-0.0001 (-1.587)								0.0004** (2.322)		
Env. viol. (log amount)								-0.00002 (-0.873)								0.0003** (2.086)	
Env. viol. (log amount)*Highly Active								0.00003 (1.177)								-0.00004 (-0.33)	
Cons. viol. (log amount)									0.0002*** (7.898)								0.0002 (1.576)
Cons. viol. (log amount)*Highly Active									-0.0002*** (-6.997)								-0.0002* (-1.924)
Adj. R ²		0.351	0.352	0.349	0.356	0.353	0.353	0.349	0.354	0.118	0.123	0.119	0.119	0.119	0.128	0.119	0.118
Obs.		13,486	13,486	13,486	13,486	13,486	13,486	13,486	13,486	16,529	16,529	16,529	16,529	16,529	16,529	16,529	16,529
PANEL B		Four-Factor Alpha							Benchmark-Adjusted Return								
		(1)	(2)	(3)	(4)	(5)	(6)		(7)	(8)	(9)	(10)	(11)	(12)			
log Scope 1 CO2 Emissions		-0.0001*** (-2.74)							-0.0001 (-0.434)								
log Scope 1 CO2*Highly Active		0.0001** (2.271)							0.0002 (1.15)								
log Scope 2 CO2 Emissions			0.001*** (8.271)							0.0002 (0.749)							
log Scope 2 CO2*Highly Active			-0.0004*** (-4.547)							-0.0002 (-0.653)							
log Scope 3 CO2 Emissions				0.0001*** (3.812)							0.001*** (4.29)						
log Scope 3 CO2*Highly Active				-0.0001*** (-2.889)							-0.0003* (-1.718)						
log Scope 1 Intensity					-0.0003*** (-7.048)							-0.001*** (-3.032)					
log Scope 1 Intensity*Highly Active					0.0003*** (4.973)							0.0004* (1.913)					
log Scope 2 Intensity						-0.0005*** (-5.253)							-0.002*** (-4.389)				
log Scope 2 Intensity*Highly Active						0.001*** (5.305)							0.001 (1.358)				
log Scope 3 Intensity							-0.0002*** (-4.603)							-0.0003 (-1.504)			
log Scope 3 Intensity*Highly Active							0.0003*** (4.826)							0.0003 (1.298)			
Adj. R ²		0.355	0.363	0.358	0.361	0.359	0.363		0.117	0.117	0.118	0.116	0.118	0.118			
Obs.		13,334	13,339	13,151	13,049	13,088	13,044		16,242	16,243	15,938	15,933	15,971	15,812			
PANEL C		Four-Factor Alpha							Benchmark-Adjusted Return								
		(1)	(2)	(3)	(4)	(5)		(6)	(7)	(8)	(9)	(10)					
ESG Score		0.00004*** (4.975)						0.0001*** (3.257)									
ESG Score*Highly Active		-0.00003*** (-4.454)						-0.00003 (-1.05)									
E Score			0.00002*** (4.017)						0.0001*** (3.286)								
E Score*Highly Active			-0.00002*** (-4.17)						-0.00004** (-2.168)								
S Score				0.00003*** (4.312)							0.0001* (1.917)						
S Score*Highly Active				-0.00003*** (-4.724)							-0.00003 (-1.155)						
G Score					0.0001*** (5.519)							0.0002*** (3.665)					
G Score*Highly Active					-0.00004*** (-3.74)							-0.00001 (-0.327)					
RepRisk						0.0001*** (5.395)							0.0001 (1.116)				
RepRisk*Highly Active						-0.00003*** (-3.798)							-0.0002*** (-3.552)				
Adj. R ²		0.353	0.353	0.353	0.353	0.398		0.118	0.118	0.118	0.12		0.119				
Obs.		13,474	13,474	13,474	13,474	11,001		16,483	16,483	16,483	16,483		12,908				

This table reports the estimated relationships between a fund's portfolio-level sustainability and its annual for-factor alpha and annual benchmark-adjusted return, comparing these relationships between highly active funds and other funds managed by the same advisors in the same years. Panel A presents estimates related to portfolio-level compliance violations. Panel B reports estimates for portfolio-level CO2 emissions and emissions intensity. Panel C provides results for portfolio-level ESG scores and RepRisk Index. All specifications include advisor-year fixed effects. All specifications control for active share, % of fund shares available to retail investors, % of sin stocks, % of oil/gas/coal stocks, and % technology stocks in the portfolio, as well as the log of fund TNA, log of fund age, annual return and return volatility, and the log of firm-level TNA. Standard errors are clustered at the fund level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. t-statistics are reported in parentheses.

Table 33: Fund Flows and Portfolio Sustainability

PANEL A	Flows							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Any viol. (indicator) $_{t-1}$	0.002 (0.902)							
Labor viol. (indicator) $_{t-1}$		-0.00002 (-0.009)						
Environ. viol. (indicator) $_{t-1}$			-0.0005 (-0.146)					
Cons. viol. (indicator) $_{t-1}$				-0.002 (-0.581)				
Any viol. (log amount) $_{t-1}$					0.0001 (0.851)			
Labor viol. (log amount) $_{t-1}$						0.0001 (0.747)		
Environ. viol. (log amount) $_{t-1}$							0.0001 (1.025)	
Cons. viol. (log amount) $_{t-1}$								-0.00002 (-0.166)
Adj. R ²	0.106	0.106	0.106	0.106	0.106	0.106	0.106	0.106
Obs.	13,566	13,566	13,566	13,566	13,566	13,566	13,566	13,566
PANEL B	Flows							
	(1)	(2)	(3)	(4)	(5)	(6)		
log Scope 1 CO2 Emissions $_{t-1}$	-0.0001 (-0.411)							
log Scope 2 CO2 Emissions $_{t-1}$		-0.0001 (-0.28)						
log Scope 3 CO2 Emissions $_{t-1}$			-0.001** (-2.457)					
log Scope 1 Intensity $_{t-1}$				0.0001 (0.444)				
log Scope 2 Intensity $_{t-1}$					0.001** (2.427)			
log Scope 3 Intensity $_{t-1}$								-0.0002 (-0.596)
Adj. R ²	0.107	0.107	0.108	0.107	0.109	0.107		
Obs.	13,307	13,307	13,034	13,071	13,107	12,919		
PANEL C	Flows							
	(1)	(2)	(3)	(4)	(5)	(6)		
ESG scores $_{t-1}$	0.00002 (0.356)							
E scores $_{t-1}$		0.0001 (1.585)						
S scores $_{t-1}$			0.00003 (0.488)					
G scores $_{t-1}$				-0.00005 (-1.002)				
RepRisk Index $_{t-1}$					-0.0002*** (-2.72)			
ESG fund								0.007*** (4.62)
Adj. R ²	0.106	0.107	0.106	0.106	0.109	0.132		
Obs.	13,527	13,527	13,527	13,527	12,101	16,215		

This table reports the estimated relationships between a fund's portfolio-level sustainability and its investor flows. Panel A presents estimates related to portfolio-level compliance violations. Panel B reports estimates for portfolio-level CO2 emissions and emissions intensity. Panel C provides results for portfolio-level ESG scores, RepRisk Index and ESG fund indicator. All specifications include advisor-year fixed effects. All specifications control for active share, % of fund shares available to retail investors, % of sin stocks, % of oil/gas/coal stocks, and % technology stocks in the portfolio, as well as the log of fund TNA, log of fund age, annual return and return volatility, and the log of firm-level TNA. Standard errors are clustered at the fund level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively. t-statistics are reported in parentheses.