Beyond Greenwashing:
ESG Disclosure Content and Investor Responses*

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Abstract: We examine heterogeneity in the substance and consequences of ESG disclosures in mutual fund shareholder letters from 2006 to 2024. We find that ESG disclosures are associated with significantly higher subsequent fund flows but little change in realized portfolio ESG performance or financial returns, which appears consistent with greenwashing. However, the average effect masks sharp heterogeneity in disclosure content: 1) Investor flow responses are driven almost entirely by *Opportunistic* (financially motivated) ESG disclosures; 2) *Opportunistic* disclosures predict higher subsequent fund alphas in the pre-Paris Agreement period, consistent with an informational advantage that dissipate as ESG becomes more salient; 3) *Impact* (values-motivated) ESG disclosures are followed by improved portfolio ESG scores, while *Opportunistic* disclosures are followed by lower ESG scores, suggesting that apparent greenwashing at the aggregate level becomes more nuanced and likely less prevalent once disclosure content is taken into account. Our findings highlight that ESG disclosure content is central to understanding investor responses, fund behavior, and greenwashing.

Keywords: ESG Disclosure Content, Shareholder Letters, Mutual Funds, Textual Analysis, Greenwashing

JEL classification: G12, G14, G23

"Funds incorporating or focusing on ESG factors currently present inconsistent information concerning how they consider ESG factors in their investment strategies to investors, other market participants, and the Commissions."

—SEC, 2022

Over the past decade, the market for Environmental, Social, and Governance (ESG)-related investment products has expanded rapidly, prompting mutual funds to increasingly position themselves as ESG-oriented to attract flows, by joining initiatives such as the Principles for Responsible Investment (PRI), adding ESG language to fund names, or highlighting ESG in fund prospectuses.[1] However, investors face a fundamental challenge: regulatory guidance provides limited clarity regarding what constitutes meaningful ESG disclosure, making it difficult to evaluate whether funds' stated ESG commitments are reflected in their actual investment practices. This gap has raised concerns about greenwashing and drawn increasing regulatory scrutiny. In 2022, the U.S. Securities and Exchange Commission proposed enhanced ESG disclosure requirements for investment advisers and funds.[2] Similarly, the European Union's Sustainable Finance Disclosure Regulation (SFDR; Regulation EU 2019/2088) mandates that sustainability-related disclosures be clear, concise, and prominent.[3] Together, these initiatives underscore the need to move beyond ESG labels and examine the *substantive content* of ESG disclosures.

Against this backdrop, we provide the first systematic analysis of the content and implications of ESG discussions in mutual fund shareholder letters. Shareholder letters represent a unique and underexplored disclosure channel since they are timely and flexible, allowing fund

[1] We summarize the related literature in Section 1.
[2] For detailed information, see: https://www.sec.gov/newsroom/press-releases/2022-92
[3] For detailed information, see: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32022R1288R(01)

managers to communicate discretionary, detailed information directly to investors. Unlike fund prospectuses, shareholder letters can elaborate on the rationale behind investment decisions, offering insight into how ESG considerations are framed and conveyed in practice.

A key motivation for our study is that the *content* of ESG discussions in shareholder letters, as well as the objective functions that such language reveals, can be as important as *whether* ESG is mentioned at all. For example, ESG discussion may use ESG as an informational signal about risk-return opportunities, express nonpecuniary "values" and commit to measurable impact, or simply reference ESG developments without outlining an implementable strategy. Because these motives can map into different subsequent fund actions and investor interpretations, distinguishing among disclosure types can provide a deeper understanding of ESG disclosure, greenwashing, and investor incentives than evidence based solely on an ESG label. In this paper, we first examine the relation between overall ESG disclosure and subsequent investor flows and fund behavior. More importantly, we then classify ESG disclosures into distinct content categories and test whether these relations vary systematically with disclosure content.

We begin by analyzing shareholder letters issued by U.S. domestic actively managed equity mutual funds from 2006 to 2024. To identify ESG-related content, we apply the FINBERT-ESG model (Huang, Wang and Yang, 2023). We find that funds disclose ESG information not only when they self-identify as ESG funds but also when they do not. To investigate fund managers' incentives for ESG disclosure, we examine investor responses to these disclosures. Because managerial compensation depends on assets under management, managers have incentives to attract inflows (Chevalier and Ellison, 1997). Using event-based regressions, we find that investors respond positively to ESG-related information disclosed in shareholder letters over the subsequent months. For example, ESG disclosure is associated with a 0.4% increase in cumulative flows in

the subsequent three months, with a *t*-statistic of 2.72, which is economically meaningful relative to the sample average three-month flow of -0.3%. Our findings remain consistent across alternative specifications, including propensity score matching, additional controls, and alternative fixed effects.

We then assess the flow effect of ESG disclosure using a difference-in-differences (DID) framework. Extending the event window to five months before and after disclosure, we apply the Local-Projection DID estimator of Dube et al. (2025) to address concerns about negative weights and the use of already-treated units as controls.[4] The results are consistent with the parallel trends assumption: we find no evidence of pre-trends and observe significant flow effects in the post-disclosure period.

Because prior literature documents widespread greenwashing, defined as a gap between firms' ESG claims and realized actions, we examine whether mutual funds' ESG disclosures are followed by realized ESG outcomes. Using both portfolio firms' ESG scores and emission control, we find no evidence that funds' portfolios become greener after ESG disclosures at the aggregate level, which *appears* to be consistent with concerns about greenwashing.

Next, we conduct a more granular analysis that accounts for the substantive content of ESG disclosures. We distinguish among disclosures motivated by *value* (enhancing risk-adjusted returns), *values* (nonpecuniary preferences independent of financial outcomes), and no articulated strategy (Starks, 2023).[5] Specifically, we classify the ESG content in shareholder letters into four categories: *Opportunistic, Exclusionary, Impact*, and *Mention Only*, following the spirit of the

[4] LP-DID from Dude, Girardi, Jorda, and Taylor (2024) is well-suited for our non-absorbing setting and addresses recent critiques regarding negative weights and the use of already-treated units as controls.
[5] For evidence on value- and values-based motivations, see also Edmans (2011), Renneboog, Horst, and Zhang (2011), Lins, Servaes, and Tamayo (2017), Krueger, Sautner, and Starks (2020), Pedersen, Fitzgibbons, and Pomorski, (2021), Ilhan et al. (2023), Edmans et al. (2024), Li, Watts, and Zhu (2024).

SEC's framework and Abis, Buffa, and Sadasivam (2024).[6] *Opportunistic* disclosures (22% of ESG-related shareholder letters) use ESG information solely to maximize financial returns, without reflecting intrinsic ESG preference. *Exclusionary* disclosures (1.5%) maintain a primary focus on financial return while incorporating ESG-related constraints, such as excluding certain industries or practices (Hong and Kacperczyk, 2009). *Impact* disclosures (8.5%) reflect a dual motivation, balancing financial goals with an explicit intent to create positive ESG outcomes. *Mention Only* disclosures refer to instances in which ESG terms are cited without substantive explanation of how they are integrated into the fund's investment strategy. Under this classification, *Opportunistic* disclosures reflect value-driven motives, whereas *Impact* and *Exclusionary* disclosures are more consistent with values-driven motives.

Re-estimating our baseline flow regressions with indicators for the four disclosure categories, we find an interesting pattern: investor flows respond almost entirely to *Opportunistic* ESG disclosures. Specifically, *Opportunistic* letters are followed by about 0.8% higher flows over the next three months and 1.1% over the next six months. In contrast, the other three types of disclosures are not associated with significantly positive subsequent flows. This heterogeneity suggests that the average "ESG disclosure" effect masks substantial variation and that investors primarily reward ESG disclosures when it is financially value relevant. When splitting the sample around the Paris Agreement (December 2015), we find that the flow effect of overall ESG disclosure is concentrated in the post-Paris period. Importantly, when we replace the aggregate ESG indicator with the four categories, the post-Paris increase is concentrated in *Opportunistic*

[6] Two authors of this paper independently and manually reviewed the shareholder letters to ensure consistent labeling. Compared with machine-based methods, this manual approach allows for more accurate classification when a detailed understanding of ESG content and context is required. Our classification is consistent with the three types of ESG funds outlined by the SEC (2022). Abis, Buffa, and Sadasivam (2024) adopt a similar categorization and study how ESG disclosures in prospectuses affect ESG ratings.

disclosure (1.3% in the post-Paris period and essentially zero pre-Paris). These results are consistent with ESG becoming more salient and commercialized following broader market recognition.

If investors reward ESG disclosure primarily for value-based reasons, a natural question is whether funds making *Opportunistic* ESG disclosures subsequently deliver superior financial returns. We find that neither *Opportunistic* disclosure, nor the other three categories, is significantly related to subsequent fund performance. We further examine whether such return predictability is time-varying. Specifically, in the per-Paris Agreement era, when ESG information was less standardized and less widely processed by market participants, *Opportunistic* ESG strategy may indicates an informational advantage. Consistent with this mechanism, we find that *Opportunistic* disclosure predicts significantly higher subsequent performance (0.5% in Carhart four-factor alpha over the next six months) in the pre-Paris Agreement period. In contrast, this relation disappears in the post-Paris period. Overall, the evidence suggests that *Opportunistic* ESG disclosure was associated with superior risk-adjusted returns only when ESG signals were relatively underexploited, and that informational rents dissipate as ESG attention and integration become widespread.

We then revisit the interpretation of greenwashing based on overall ESG disclosure. Much of the existing literature infers greenwashing from the *presence* of ESG-related language and then tests whether funds "walk their talk" by examining subsequent portfolio ESG characteristics. Our content-based classification allows for a more precise test by linking each disclosure type with its implied ESG objective. We find systematic heterogeneity in post-disclosure ESG outcomes: funds making Opportunistic disclosures subsequently hold portfolios with *lower* ESG scores, whereas funds making *Impact* disclosures exhibit *improvement* in portfolio ESG scores. Additionally, the

significant changes in ESG performance are due to the E and S pillars rather than the G pillar. In contrast, *Mention Only* disclosures show no meaningful changes in ESG outcomes.

Critically, these outcomes are largely *consistent* with the stated intent embedded in each disclosure type. *Opportunistic* letters explicitly frame ESG as an input to maximize risk-adjusted returns, not as a commitment to "greening" the portfolio, while *Mention Only* disclosures reference ESG without specifying an implementable strategy. Accordingly, the absence of improved ESG outcomes following these two disclosure types is not necessarily evidence of greenwashing. *Impact* disclosures explicitly emphasize positive ESG outcomes, and the observed improvements in subsequent ESG scores suggest that these funds "walk their talk." Overall, these results suggest that apparent greenwashing at the aggregate level becomes more nuanced, and likely less prevalent, once the substance of ESG disclosure is taken into account.

Finally, we propose an equilibrium explanation for why not all funds disclose ESG information despite its flow benefits. If, as our results indicate, investors' flow response to ESG disclosures are primarily financially motivated, then ESG disclosures, especially *Opportunistic* disclosure, may expose funds to downside flow risk when subsequent financial performance disappoints. We test this mechanism by examining longer-term flows and allowing the flow response to depend on realized post-disclosure fund returns. Consistent with this mechanism, we find a significant moderating effect of fund performance: funds making ESG disclosures, relative to their peers, experience *larger* outflows when their post-disclosure performance falls below the median. This effect is particularly pronounced for funds that make *Opportunistic* disclosures. These findings suggest that ESG disclosure can generate flow gains but also entails a state-contingent amplification of outflows when performance disappoints. This tradeoff provides an equilibrium rationale for why some fund managers refrain from ESG disclosure despite its

potential to attract inflows.

This study contributes to the literature in several ways. First, we uncover the importance of distinguishing among types of ESG disclosure and show that their implications for fund flows and performance are heterogenous. While prior studies largely assess the presence of ESG-related terminology in fund discourse (Andrikogiannopoulou et al., 2025; Cao et al, 2025; Kim and Yoon, 2023), we conduct a more granular analysis by classifying ESG disclosure into four categories: *Opportunistic*, *Impact*, *Exclusionary*, and *Mention Only*. This classification reveals that the link between ESG disclosure and fund flows is more nuanced than previously documented, with inflows concentrated in *Opportunistic* disclosure. Furthermore, we find that greenwashing appears less prevalent than previously documented once the substance, rather than merely the presence, of ESG disclosure is taken into account.

Second, we document that investors' responses to ESG disclosures are driven primarily by financial value rather than nonpecuniary values. There is an ongoing debate in the sustainable finance literature about whether investor responses reflect value-based motives (e.g., Edmans, 2011; Lins, Servaes, and Tamayo, 2017; Pedersen, Fitzgibbons, and Pomorski, 2021; Edmans et al., 2024; Li, Watts, and Zhu, 2024) or values-based motives (e.g., Krueger, Sautner, and Starks, 2020; Renneboog, Horst, and Zhang, 2011; Ilhan et al., 2023). By directly observing how flows respond to different types of ESG information, we provide evidence consistent with a predominantly value-based motivation.

Third, we show that fund managers possess skills in leveraging ESG-related informational advantages, allowing them to generate superior returns when ESG considerations are not yet widely recognized. A large literature examines whether fund managers can generate alphas for investors (Jensen, 1968; Carhart, 1997; Kacpercyk and Seru, 2007; Fama and French, 2010; Pastor

and Stambaugh, 2012; Berk and Van Binsbergen, 2015; Pastor, Stambaugh and Taylor, 2015), with mixed results. We contribute to this debate by showing that fund managers can exploit ESG information before it becomes widely incorporated into prices, particularly in the period preceding the Paris Agreement, thereby delivering superior returns to their inventors.

1. INSTITUTIONAL BACKGROUND

1.1 Mutual Fund ESG Disclosures

Despite extensive literature on sustainable finance and ESG disclosure, relatively little attention has been paid to the actual content of mutual funds' ESG disclosures. Investors increasingly rely on ESG information from asset managers to guide capital allocation, yet the specific content of these disclosures remains unclear. This gap in understanding poses challenges for both industry practitioners and academic researchers.

The Securities and Exchange Commission (SEC, 2022) highlights a growing challenge in the mutual fund industry: inconsistent ESG information prevents investors from precisely interpreting how funds incorporate ESG considerations into their investment strategies. Such ambiguity has raised concerns about greenwashing by asset managers (Cochardt, Heller and Orlov, 2023; Dumitrescu, Gil-Bazo and Zhou, 2023; Kim and Yoon, 2023; Liang, Sun and Teo, 2022; Wu, Zhang, and Xie, 2020) and fueled ongoing debates over value- versus values-driven investing (Friedman and Ormazabal, 2024; Starks, 2023). Regulatory enforcement actions underscore the salience of these issues. For instance, in May 2022, the SEC fined BNY Mellon $1.5 million for ESG-related misstatements and omissions, and in November 2022, it fined Goldman Sachs $4.0 million for misleading customers about ESG investments.[7] Similar concerns have been raised in

[7] For the details of these two cases, see "SEC fines BNY Mellon over ESG in first case of its kind" (*Financial Times*, May 2022) and "Goldman Sachs to pay $4mn penalty over ESG fund claims" (*Financial Times*,

Europe. The European Union's Sustainable Finance Disclosure Regulation (Regulation EU 2019/2088) states: "It is therefore necessary to address concerns about greenwashing, that is, in particular, the practice of gaining an unfair competitive advantage by recommending a financial product as environmentally friendly or sustainable, when in fact that financial products does not meet basic environmental or other sustainability-related standards."[8]

Prior literature generally analyzes mutual funds' ESG practices using observed actions such as PRI signatory status (Kim and Yoon, 2023; Gibson et al., 2022), ESG-related terminology in fund names (Cremers, Riley, and Zambrana, 2025; van de Beck, 2025), or third-party sustainable ratings of funds and their holdings (Gantchev, Giannetti, and Li, 2024; Hartzmark and Sussman, 2019). Two recent studies examine the specific content of mutual fund ESG disclosures. Andrikogiannopoulou, Krueger, Mitali, and Papakonstantinou (2025) analyze ESG statements in fund prospectuses and identify potential greenwashing by detecting discrepancies between the extent of ESG disclosure and the ESG scores of portfolio holdings. Cao, Chen, Xiao, and Zhang (2025) analyze ESG discussions in fund shareholder letters to detect potential greenwashing and examine the costs and benefits for greenwashers. While both studies provide novel evidence on greenwashing by focusing on the presence of ESG-related terminology in mutual fund disclosures, we examine the substantive content of such disclosures and classify them by the specific ways funds incorporate ESG into their investment strategies. This deeper analysis improves our understanding of mutual fund ESG practices and their effects, as well as how and why investors respond to ESG disclosures.

1.2 Mutual Fund Shareholder Letters

November 2022)

[8] For detailed information, see https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32022R1288R(01)

Under section 30(e) of the Investment Company Act of 1940, the SEC requires all registered investment companies to provide semiannual financial reports to their shareholders. These reports, filed as N-CSR (annual) and N-CSRS (semiannual), include information on portfolio composition, fund performance, expenses, and statements of income and balance sheets. Notably, over 89% of these reports include a letter directly addressed to shareholders (Hillert, Niessen-Ruenzi, and Ruenzi, 2024). Based on the ICI Shareholder Report Survey, 63% of mutual fund investors read at least some portion of these reports, and more than half read a substantial portion. Because shareholder letters typically appear at the beginning of the reports, a significant number of investors are likely to notice and potentially be influenced by their content.

Compared with mutual fund prospectuses, shareholder letters offer several advantages for analyzing mutual funds' ESG disclosure. First, shareholder letters provide a direct channel through which fund managers communicate with investors and often contain more spontaneous information (Cao, Yang, and Zhang, 2024). Second, they are disclosed semiannually, providing more up-to-date insights. Third, their flexible format allows fund managers to elaborate on details such as the rationale for holding or divesting specific stocks. For example, in its December 2021 shareholder letter, the Aspiration Redwood Fund noted: "Research has shown that companies with stronger environmental, social, and governance practices may tend to overperform their peers. That's why the Redwood Fund seeks to marry value to values …" Taken together, shareholder letters constitute a valuable source for understanding how fund managers frame and communicate ESG considerations.

2. DATA AND SAMPLE CONSTRUCTION

2.1 Mutual Fund Shareholder Letters

We develop a web crawler to download certified annual and semiannual shareholder reports

(Forms N-CSR and Form N-CSRS) filed by U.S. mutual fund management companies in the SEC's EDGAR database from 2006 to 2024. Registered investment companies must electronically file Forms N-CSR and NCSRS to the SEC within 10 days of sending the corresponding reports to shareholders. We obtain 111,009 reports in total. We then apply a keyword-search method to extract key information for each document, including series id (fund identifier), ticker (share-class identifier), class id (share-class identifier), Central Index Key (CIK, company identifier), filing date (the date the document was filed), conformed period of report (the filing's reporting period end date), company's name, and fund name (series name).

Next, we extract shareholder letters from the reports using a three-step approach. First, we locate likely start and end points of a letter using common phrases. The most frequent markers are "Dear Shareholder" (start) and "Thank you" (end). We identify 26 start phrases and 14 end phrases in total.[9] Additionally, based firm-specific writing styles, we construct firm-specific phrases, such as "Chairman's letter" and "Management's discussion". Second, for reports where a letter is not identified in the first step, we search for a section titled "Management's Discussion and Analysis of Fund Performance". Because some fund managers do not include a standalone letter and instead provide a market overview and performance discussion in this section, we also treat this section as a shareholder letter, following Hillert, Niessen-Ruenzi and Ruenzi (2024). Third, if a letter still cannot be identified, we treat Item1 (a report to shareholders) in the form as the shareholder letter.[10] Since automatic extraction sometimes results in implausibly short or long texts, we exclude letters

[9] Other examples of start and end phrases include "Dear investor", "Dear fellow", "Note to shareholder", "Sincerely", "Yours truly" and "Respectfully".

[10] An N-CSR filing typically includes the following items: a report to shareholders (Item 1); the company's code of ethics (Item 2); the names of the financial experts in the company's audit committee (Item 3); disclosure of principal accountant fees and services for the previous two fiscal years (Item 4); disclosure of listed registrants or the reason for exemption from the audit committee (Item 5), the firm's security holdings (Item 6); and disclosure of proxy voting policies (Item 7).

with fewer than 30 words or more than 392,024 words (i.e., the 99th-percentile cutoffs).

We merge the shareholder letters from SEC EDGAR with the Center for Research on Security Prices (CRSP) survivorship bias free mutual fund database using the "CRSP_cik_map" table. We aggregate all share classes data to the fund level, and our analysis is based on fund-letter observations. As we focus on actively managed domestic U.S. equity mutual funds, we delete ETFs, pensions, annuities, and index funds, following Bessembinder, Cooper, and Zhang (2023).[11] Although mutual funds start to file Form N-CSR in 2003, series and class identifiers are not mandatory until 2006. Therefore, our sample period starts from January 2006.

2.2 Identifying ESG-Related Information in Shareholder Letters

To identify ESG-related content in shareholder letters, we employ FINBERT (Huang, Wang and Yang, 2022), a BERT-based model (Devlin, Chang, Lee and Toutanova, 2019) tailored to finance. BERT is a sentence-level language model that typically outperforms traditional NLP approaches, and recent studies have applied BERT-based methods in financial research (e.g., Rajan, Ramella and Zingales, 2023). Unlike traditional BERT model, FINBERT is pretrained financial disclosures (e.g., 10-Qs, analyst reports, earning call transcripts), generating better performance on financial disclosures. Importantly, FINBERT has a fine-tuned variant, FINBERT-ESG, trained on over 24,000 manually annotated sentences from firms' ESG and annual reports.[12] This model is specifically designed to identify ESG-related information in financial disclosures and has been

[11] Specifically, we exclude exchange traded funds, exchange traded notes (those with CRSP et_flag equal to "F" or "N"), funds that take short positions (with CRSP fund style "EDYS"), commodity funds (with CRSP fund style "EDSC"), real estate funds (with CRSP fund style "EDSR"), hedged funds (with CRSP fund style "EDYH" or Lipper objective code "LSE"), market neutral funds (with CRSP fund style "EDYH" or Lipper objective code "EMN") and absolute return funds(with CRSP fund style "EDYH" or Lipper objective code "ABR"). Next, we exclude target date funds with names that contain a four-digit number between 1990 and 2050 and the word "target". Last, we manually check and exclude funds with names that contain "VIX", "Long/Short", "Long-Short", "OTC/Short", "ETF", "ETN", "1.25x", "1.5x", "2x", "2.5x", "3x", or "4x".

[12] For detailed information on the training process, classification definitions, and examples, see: https://www.allenhuang.org/uploads/2/6/5/5/26555246/esg_9-class_descriptions.pdf.

successfully applied in recent research (e.g., Campbell, Davidson, Mason, and Utke, 2025).

For each sentence in a shareholder letter, we input it into FINBERT-ESG, which returns four labels, *Environmental, Social, Governance,* and *None,* along with a score for each label indicating the likelihood that the sentence belongs to the category. We classify a sentence as ESG-related if FINBERT-ESG assigns it to one of the three ESG labels – Environmental, Social, or Governance.

2.3 Fund-Level Variables

Our fund-level variables come from two sources. We obtain fund characteristics, including monthly returns, assets under management, and expense ratios from CRSP's Survivorship-Bias-Free U.S. Mutual Fund Database. Following the literature (e.g., Sirri and Tufano, 1998), we compute flows as the monthly growth of assets under management, net of reinvested returns:

$$Flow_{i,t} = \frac{TNA_{i,t} - TNA_{i,t-1} \times (1 + R_{i,t})}{TNA_{i,t-1}} \quad (1)$$

where $Flows_{i,t}$ is fund i's flows in month t, $TNA_{i,t}$ is fund i's total net assets at the end of month t, and $R_{i,t}$ is the fund's return in month t.

For the second source of fund-level variables, we obtain ESG self-label data from Morningstar. We define self-labelled ESG funds based on Morningstar Sustainable Funds U.S. Landscape Report and extract each fund's inception date and repurpose date. We then compare the shareholder letter's filing date to the fund's repurpose date (or, if unavailable, its inception date) to determine whether the fund is ESG self-labeled on the filing date.

Finally, we merge these two databases using tickers and aggregate all data at the fund level. Our sample spans January 2006 to December 2024 and includes 43,523 events of shareholder letters for 2,455 actively managed domestic U.S. equity mutual funds. Among these shareholder

letters, 8,182 (or 19%) contain ESG-related information. Table 1 presents summary statistics for the characteristics of shareholder letters and funds in our sample. The variables are consistent with those in exiting studies, and detailed definitions are provided in Appendix A.

3. ESG DISCLOSURES IN SHAREHOLDER LETTERS AND FUND FLOWS

Mutual fund managers' compensation is primarily determined by the fees they generate, which are closely tied to the assets under management of their funds. This creates incentives for fund managers to attract inflows to maximize fees (Chevalier and Ellison, 1997). On the one hand, ESG disclosure in shareholder letters could potentially drive fund inflows. Prior research documents several instances where ESG-related signals boost fund inflows: becoming a PRI signatory (Kim and Yoon, 2023; Gibson, Glossner et al., 2022), earning high Morningstar Sustainability Ratings (Hartzmark and Sussman, 2019), including ESG disclosures in fund prospectuses (Andrikogiannopoulou et al., 2024), and using ESG-related terminology in fund names (Cremers, Riley, and Zambrana, 2025; van de Beck, 2025). On the other hand, ESG disclosure in shareholder letters could prompt fund outflows from investors who oppose ESG or who prioritize short-term financial returns. Recent studies suggest that ESG engagement can dampen short-term financial performance (Raghunandan and Rajgopal, 2022), potentially shifting capital toward funds focused on immediate returns. It is also possible that ESG disclosure in shareholder letters has no effect on flows if investors view the information as financially immaterial. Ultimately, the impact of ESG disclosure in shareholder letters on fund flows is an empirical question.

3.1 Baseline Results

We examine how fund flows respond to ESG disclosure in shareholder letters by estimating the following event-level regression:

$$Flow_{i,t+1\to t+T} = \beta \times ESG_{i,t} + \gamma \times Controls_{i,t-1} + FE + \varepsilon_{i,t} \quad (2)$$

For each shareholder letter issued by fund *t* in month *i*, the dependent variable is cumulative fund flows over the subsequent three or six months (T=3 or 6). The key independent variable, $ESG_{i,t}$, is an indicator equal to 1 if fund *i* includes ESG information in the shareholder letter in month *t*, and zero otherwise. *Controls* include past six-month performance (cumulative raw return, market-adjusted return, or Carhart alpha), fund risk (squared cumulative raw return over the prior six months), past six-month fund flows, and fund characteristics including fund size, fund age, expense ratio, fund family size, and fund family age. We also include a dummy indicating whether the fund is self-labeled as an ESG fund in Morningstar's Sustainable Funds U.S. Landscape Report, as well as the length of the shareholder letter. Fund and year-month fixed effects are included to account for fund- and time-specific unobserved heterogeneity, respectively. Detailed definitions of all variables are provided in Appendix A.

Table 2 presents the regression results. Columns 1 to 3 use cumulative flows over the subsequent three months as the dependent variable. The coefficients on the *ESG* are positive and significant at the 1% levels across all specifications, indicating that disclosing ESG information in shareholder letters attract more inflows. Economically, funds with ESG disclosure in their shareholder letters experience 0.4% higher inflows over the following three months, compared with funds whose shareholder letters contains no ESG information. This effect is economically significant, given that the sample average cumulative three-month flow is -0.3%. Columns 4 to 6 use cumulative flows over the subsequent six months, showing an increase in fund flows of 0.6% over the subsequent six months following ESG-related shareholder letters.

The estimates for the control variables align with prior studies. For example, the coefficient on cumulative Carhart Alpha is positive and significant, in line with the literature documenting a

positive flow-performance relation (Chevalier and Ellison, 1997). The effect of expense ratio on fund flow is negative and significant, which is consistent with Barber, Odean and Zheng (2005). Overall, the results in Table 2 show that ESG disclosure in shareholder letters is associated with significantly higher subsequent fund inflows.

3.2 Robustness Tests

We conduct robustness tests to address the concern that the documented flows effect may be driven by factors other than ESG disclosures. First, funds may discuss pre-shareholder-letter actions or strategy changes in the shareholder letter, which could in turn affect post-letter fund flows. To control for pre-letter actions and changes in fund strategies, we construct a measure of pre-letter holding changes, defined as the cosine similarity of portfolio weights between quarter *q* - 1 (the most recent portfolio holdings before the letter) and quarter *q* - *2* (the prior quarter). In Panel A of Table 3, Column 1 adds this measure to our baseline regression. The coefficient on *ESG* remains similar in magnitude and statistical significance, indicating that the flow effect is unlikely to be driven by pre-letter changes in fund strategy.

Second, we consider whether the changes in other aspects of shareholder-letter content may influence fund flows. Column 2 of Table 3 Panel A adds a measure of change in shareholder letter's content relative to the prior letter, calculated as the textual cosine similarity between the focal letter and the previous shareholder letter. This variable captures the extent to which the textual content differs across letters, reflecting the degree of information updating from the previous to the current letter. We add this variable as an additional control in our baseline regression. The coefficient on *ESG* remains similar, indicating that the flow response is specifically tied to ESG disclosures rather than to general textual updates in shareholder letters.

Third, we examine whether the flow effect of ESG disclosure is incremental to the

sentiment of shareholder letters. Prior research shows that fund investors respond to negative tone of shareholder letters (Hillert, Niessen-Ruenzi, and Ruenzi, 2024). Column 3 adds two measures of the positive and negative sentiment of shareholder letter, calculated as the percentage of positive and negative words based on Loughran and McDonald's (2011) dictionary, respectively. Column 3 shows that the coefficient on *ESG* remains positive and significant at the 1% level, suggesting that the flow effect of ESG disclosure is robust after controlling for the tone of the shareholder letter. For brevity, we do not report the coefficients of control variables. Consistent with Hillert, Niessen-Ruenzi, and Ruenzi (2024), we find in untabulated results that the average negativity in our sample shareholder letters is 1.95%, and the coefficient on *Negativity* is negative and statistically significant, indicating that more negative tone predicts lower future flows.

Fourth, we address selection and endogeneity concerns using a propensity score matching (PSM) approach to construct a matched sample (Hartzmark and Sussman, 2019). We implement one-to-one nearest-neighbour matching without replacement to improve covariate balance. For each fund that disclose ESG information in its shareholder letter at a given time, we select a matched fund that issues a shareholder letter in the same quarter but without ESG content. Propensity scores are estimated via logistic regression using Carhart four-factor loadings, cumulative Carhart alpha over the prior six months, cumulative flow over the prior six months, expense ratio, fund size, and fund age. Treated funds are matched to control funds with the closest propensity scores. Table C1 in Appendix C reports differences in fund characteristics between treated and control funds before and after matching. The results show that after matching, the two groups are well balanced on fund characteristics.

Before conducting regression analysis, we first plot the differences in abnormal fund flows

between treated and matched funds before and after disclosure dates (Figure 1).[13] The visual evidence corroborates our baseline results, indicating positive flow effects following ESG disclosure in shareholder letters. We then re-estimate equation (2) using the matched sample with the same set of control variables as our baseline analysis (Column 3 of Table 2). In Panel B of Table 3, Column 1 presents the regression results, where the coefficient on *ESG* remains positive and significant at the 1% level, providing further support for our main finding.[14]

Finally, we conduct robustness tests that incorporate additional fixed effects. In Panel B of Table 3, Column 2 adds fund-category fixed effects based on Lipper objective codes from CRSP to mitigate the concern that the ESG flow effect may be concentrated within specific fund styles. Column 3 includes reporting-date fixed effects to account for potential time-specific factors associated with disclosure timing. The results remain consistent across these alternative specifications.

3.3 DiD Analysis: Parallel Trends and Dynamic Effects

To complement our baseline event-based regression analysis, we conduct a Difference-in-Differences (DID) analysis using the PSM matched sample. Specifically, we use the PSM-matched sample and include five months before and after the disclosure date.[15] Our setting differs from the traditional DID framework in two important ways. First, funds disclose ESG information in shareholder letters at different times, resulting in a staggered DID design. Staggered DID applications have two potential issues: (1) already-treated units may serve as controls, and (2) two-

[13] Abnormal fund flows are calculated by taking the regression residuals when regressing flows on fund characteristics and other controls used in column 3 of Table 2.
[14] Because PSM estimates can be sensitive to the choice of matching variables (Heckman, Ichimura,and Todd, 1998), we use an alternative set of matching variables to construct the control group. As shown in Table C2 of Appendix C, the results are robust.
[15] This ensures that each event period contains only one shareholder letter for each mutual fund, thereby mitigating the potential influence of subsequent shareholder letter on the current one. Our results remain consistent with longer event windows.

way fixed effects estimators can place negative weights (Baker, Larcker, and Wang, 2022; Goodman-Bacon, 2021; Sun and Abraham, 2021). To address these concerns, we use the Local-Projection DID (LP-DID) estimator of Dude, Girardi, Jorda and Taylor (2024), which addresses both issues and is well suited for staggered adoption settings. Second, ESG disclosure in shareholder letters may recur cease over time—that is, treatment is binary but non-absorbing.[16] A given fund may enter, exit, or switch between treated and untreated states during the study period, unlike traditional DID setups that assume permanent (absorbing) treatment. Our empirical strategy explicitly accommodates this dynamic treatment pattern.

To assess the parallel trends assumption and examine dynamic effects, we report LP-DID estimates at the fund-month level in Table 4. The dependent variable is monthly fund flow. ESG^{Pre} and ESG^{Post} denote pooled estimates before and after disclosure respectively, while *ESG* is an indicator for treated funds. Pre(5) through Pre(2) are indicators for 5 to 2 months before disclosure, with Pre(1) excluded to avoid collinearity. Post(1) through Post(5) indicate 1 to 5 months after disclosure. Columns 1 and 2 present pooled estimates without and with controls, respectively, while Columns 3 and 4 report the corresponding event-study estimates. Across all specifications, the parallel-trend assumption is supported, and the post-disclosure interaction terms (i.e., the coefficients on ESG × Post(0) through ESG × Post(5)) are positive and significant, aligns with the notion that ESG disclosures attract inflows.

Figure 2 plots the estimated coefficients for the five months before and after disclosure, respectively. Consistent with the parallel trend assumption, no statistically significant differences in flows are observed between treated and control funds prior to disclosure.

[16] Many studies assume that treatment effects are permanent, which is not applicable in our setting (see Assumption 1 in Callaway and Sant'Anna, 2020, and Section 2 in Sun and Abraham, 2020).

3.4 Greenwashing? Evidence from Post-Disclosure Portfolio Holdings

Greenwashing has been widely documented in the literature and is typically defined as a discrepancy between what firms claim in their ESG communications ("talk") and what they actually do in practice ("walk"). Following the literature, we examine potential greenwashing by constructing fund-level ESG scores based on portfolio holdings. We then test how these scores change over the subsequent three months across the *ESG* and non-*ESG* shareholder letters. To implement this test, we replace the dependent variable in Equation (2) with the fund-level ESG score and re-estimate the model.

Table 5 presents the regression results using overall ESG scores (Column 1) and the E, S, and G component scores (Columns 2 to 4). The coefficient on ESG is statistically insignificant across all specifications, suggesting that funds' portfolios do not become greener after ESG disclosure. In Column 5, we replace the ESG score with average emission reduction score of portfolio firms, which measures a firm's commitment and effectiveness towards reducing environmental emissions. The coefficient on *ESG* remains statistically insignificant. Overall, these results seem to point to greenwashing by mutual funds with respect to ESG disclosures. However, we revisit this conclusion in Section 5 by conducting a more in-depth analysis using the substantiative content of mutual funds' ESG disclosures.

4. ESG DISCLOSURE CONTENT: A CLOSER LOOK

We examine the specific content of mutual fund ESG disclosures in shareholder letters to understand why investors respond positively and how fund behavior varies across different types of ESG disclosures. Investors' attention to ESG can be conceptualized along two distinct dimensions: *value* and *values* (Starks, 2023; Friedman and Ormazabal, 2024). On the *value* dimension, investors may believe fund managers integrate ESG factors to enhance risk-adjusted

returns (Edmans et al., 2024; Li, Watts, and Zhu, 2024; Pedersen, Fitzgibbons, and Pomorski, 2021; Lins, Servaes, and Tamayo, 2017; Edmans, 2011). On the *values* dimension, investors may recognize that fund managers are motivated by non-pecuniary preferences or moral considerations that influence investment decisions independently of financial outcomes (Ilhan et al., 2023; Krueger, Sautner, and Starks, 2020; Renneboog, Horst, and Zhang, 2011). Therefore, we classify ESG disclosures in shareholder letters into value- and values-related categories and investigate their flow effects separately.

4.1 Classifying ESG Disclosures

Anecdotal evidence suggests that ESG disclosure in the investment management industry has lacked consistency, complicating investors' ability to assess what ESG-labelled strategies represent in practice. These inconsistencies between ESG disclosure and realized outcome have prompted heightened regulatory scrutiny.[17] In 2022, the SEC proposed enhanced ESG disclosure requirements for registered investment companies to protect investors, facilitate efficient capital allocation, and ensure alignment between disclosed ESG strategies and investors' objectives. As emphasized by former SEC Chair Gary Gensler, investors should be able to "drill down to see what's under the hood" of ESG disclosures, given the substantial heterogeneity in their content and scope.[18]

The SEC proposal requires funds to disclose the extent to which ESG factors are incorporated, relative to other considerations, in the investment decision-making process. On the one hand, ESG considerations may be more decisive, such as when funds exclude investments based on explicit

[17] BNY Mellon was the first mutual fund company fined by the U.S. Securities and Exchange Commission (SEC) for ESG disclosure deficiencies, followed by a similar enforcement action against Goldman Sachs.
[18] See the 2022 Statement on ESG Disclosures Proposal by former SEC Chair Gary Gensler at: https://www.sec.gov/newsroom/speeches-statements/gensler-statement-esg-disclosures-proposal.

ESG criteria or engage with portfolio companies to pursue specific ESG objectives. On the other hand, ESG considerations may play a more limited role, with funds basing portfolio construction primarily on financial factors (e.g., firm-specific metrics such as price-to-earnings ratios). In the spirit of the SEC's framework, we classify ESG disclosures into four categories, following Abis, Buffa, and Sadasivam (2024). These categories are economically distinct in terms of the role ESG information plays in the fund's objective function.[19]

Specifically, we classify ESG disclosure into four categories: *Opportunistic, Exclusionary, Impact*, and *Mention Only*.[20] The definitions of these four categories are as follows:

- *Opportunistic*: ESG considerations are used to maximize risk-adjusted returns rather than to express intrinsic ESG preferences. ESG factors serve as supplemental inputs, incorporated only when expected to enhance financial performance. Managers may still accept ESG risks or negative externalities if sufficiently compensated by financial returns.
- *Exclusionary*: Strategies optimize risk-return profiles subject to ESG-related investment constraints. Certain firms or sectors are excluded based on ESG considerations, and portfolio allocation occurs within the restricted investable universe (Hong and Kacperczyk, 2009).
- *Impact*: Strategies integrate ESG preference directly into portfolio management. Investment decisions reflect both risk-return trade-offs and explicit ESG objectives (e.g., contributions to climate change mitigation or social development).
- *Mention Only*: ESG terms are referenced without any specific explanation, implementation details, or elaboration.

[19]This classification is also consistent with the 2022 Presidential Address of the American Finance Association, which emphasizes the importance of distinguishing between financially motivated considerations and nonpecuniary "values" (Starks, 2023).
[20] For detailed information, see https://www.sec.gov/files/rules/proposed/2022/ia-6034.pdf.

These four categories map to the framework of Pedersen, Fitzgibbons, and Pomorski (2020).[21] Funds providing *opportunistic* ESG disclosures resemble the behavior of type-A (ESG-aware) investors, who possess mean-variance preferences and use ESG information to update their expectations of risk and return. By contrast, funds offering *Exclusionary* or *Impact* disclosures are more closely aligned with type-M (ESG-motivated) investors, who not only incorporate ESG information but exhibit a preference for high-ESG assets. Additionally, funds making *Mention Only* disclosures may simply reference ESG or market developments without indicating any preferences or implementation.

Based on these definitions, two independent readers (the authors) manually classify ESG disclosures in shareholder letters into four categories, with cross-checks to ensure consistency.[22] The manual approach has several advantages. First, existing textual models are not yet sufficiently developed to provide granular classifications of ESG disclosures, particularly when a detailed contextual understanding is required. Second, the flexible format of shareholder letters leads to substantial variation in content, which can cause bias or misclassification in machine-based models.[23] Third, human readers are more likely to capture disclosures in ways that mirror how investors interpret ESG information, making this approach well suited to study investor responses to different types of ESG content.

Among ESG-related shareholder letters, approximately 22% are classified as *Opportunistic*, 1.5% as *Exclusionary*, 8.5% as *Impact*, and the remainder provide vague ESG references without

[21] Abis, Buffa, and Sadasivam (2024) and Yang and Yasuda (2025) employ a similar categorization. They examine the strategy sections of fund prospectuses and investigate how differences in these ESG strategies affect fund-level ESG outcomes.

[22] Note that our labels are not mutually exclusive. In a few cases, a letter contains multiple types of ESG disclosures. For example, *impact* disclosure is sometimes accompanied by *exclusionary* disclosure. In this case, both the exclusionary and impact dummies are set to one. As a robustness check, we also construct a mutually exclusive categorization following Abis, Buffa, and Sadasivam (2024), and our results remain consistent.

[23] For example, some shareholder letters include statements like "The weather is not good", which do not refer to actual weather but rather to overall market conditions.

detailed information (*Mention Only*). Examples for each category are provided in Appendix B. This classification captures heterogeneity in ESG communication, enabling us to identify which types of disclosure are most strongly associated with subsequent investor flows.

4.2 Value or Values? The Flow Effects of Different ESG Information

We explore whether investor responses to ESG disclosure are primarily driven by value-based (risk-return) or values-based (non-pecuniary) motivation. In our classification, *opportunistic* ESG disclosure represents a value-driven motive because it centers on the risk-return implication of ESG factors. By contrast, *Exclusionary* and *Impact* disclosures reflect values-driven motives, as they explicitly incorporate non-pecuniary ESG preferences into investment decision-making process.

We re-estimate Equation (2) using dummy variables for the four disclosure categories as independent variables. Table 6 presents the regressions of subsequent three-month flows (Columns 1 to 3) and six-month flows (Columns 4 to 6). We find a striking divergence across disclosure types. The coefficient on the *Opportunistic* dummy is positive and statistically significant in all specifications, suggesting that *Opportunistic* ESG disclosure is associated with significantly higher subsequent inflows. In contrast, the *Exclusionary* and *Impact* dummies are largely insignificant across models, with *Impact* negative and only marginally significant in two of the six specifications. Taken together, these results suggest that investor flow responses are motivated primarily by *value* considerations rather than *values* considerations. This interpretation is consistent with previous literature arguing that investors incorporate ESG information to improve risk-adjusted returns rather than to express non-pecuniary preferences (Gantchev, Giannetti, and Li, 2024; Chen et al., 2025). We contribute to this burgeoning literature by providing the first direct evidence that investors respond to value-based ESG disclosures rather than values-based ESG

disclosures. Additionally, the coefficient on *Mention* is statistically insignificant across all specifications, suggesting that ESG disclosures without a specific discussion of implementation do not trigger significant investor flow responses

4.3 Flow Effects of ESG Disclosure Before and After the Paris Agreement

To further validate that the observed flow effects are attributable specifically to ESG disclosure rather than to other contemporaneous factors or compounding events, we examine whether the flow effects intensify after the Paris Agreement (December 2015). The Paris Agreement marks a pivotal global milestone that significantly elevates awareness of climate and sustainability issues among investors, regulators, and other market participants. If investor flows are indeed driven by ESG disclosure, we would expect the flow effects to be more pronounced in the post-Paris Agreement period.

We divide the sample into pre- and post-Paris Agreement periods and re-estimate Equation (2) using either the *ESG* dummy or the four category dummies as the key independent variables. Table 7 reports the results, where Columns 1 and 2 show that *ESG* is small and statistically insignificant in the pre-Paris Agreement period but becomes large and significant in the post-Paris Agreement period, suggesting that the flow effects of ESG disclosures strengthens in the post-Paris Agreement period.

More importantly, Columns 3 and 4 show that this increase is concentrated in *Opportunistic* ESG disclosure, which attract significantly more flows in the post-Paris Agreement period, whereas the other three categories remain insignificant. The χ^2 tests confirm that the difference in coefficients between pre- and post-Paris Agreement periods is statistically significant, consistent with ESG disclosures becoming more salient to investors after the Paris Agreement.

4.4 ESG Strategy and Fund Performance

Having established that investor flow responses to ESG disclosures appear to be financially motivated, a natural question is whether funds that make *Opportunistic* ESG disclosures subsequently deliver superior returns. The existing literature shows mixed evidence regarding the relation between ESG activities and fund performance. For instance, Gibson et al. (2022) show that mutual funds that participate in the PRI do not necessarily achieve superior financial performance, and Gantchev, Giannetti, and Li (2024) report a negative association between holding high-ESG-score stocks and subsequent returns. Andrikogiannopoulou et al. (2025) find that among funds with ESG strategies, only those not classified as greenwashers exhibit better financial performance.

We argue that the relation between ESG investing and subsequent returns may vary across ESG investor types and over time. First, ESG participants are heterogeneous: some funds may hold high ESG score stocks for financial (risk-return) reasons, while others do so for non-pecuniary motives. These different incentives can lead to different return outcomes. Second, for value-motivated ESG investing, if funds use ESG information as an incremental input alongside traditional financial signals, any information advantage should erode as ESG awareness becomes more widespread. We examine this time variation around the Paris Agreement. If the Paris Agreement increases the salience of ESG considerations for market participants, the ESG-related information advantage may diminish thereafter, leading to the value-motivated ESG investors to generate less outperformance in the post-Paris period.

To examine cross-investor heterogeneity, we estimate the following regression at the shareholder-letter level:

$$Performance_{i,t+1\to t+6} = \beta_1 \times Opportunistic_{i,t} + \beta_2 \times Exclusionary_{i,t} + \beta_3 \times Impact_{i,t} + \beta_4 \times Mention_{i,t} + \gamma \times Controls_{i,t-1} + FE + \varepsilon_{i,t} \quad (3)$$

where *Performance* is measured as cumulative raw return, market-adjusted return, or Carhart alpha over the subsequent six months. The main independent variables are the indicator variables for the four types of ESG disclosures. The control variables are the same as those used in Equation (2). We include both fund and year-month fixed effects.

Table 8 presents the regression results. Panel A presents results for overall ESG disclosure (without categorizing disclosures). We find weak evidence that ESG disclosure in shareholder predicts higher subsequent fund performance, as the coefficient on *ESG* is positive and statistically significant in the first two models but becomes insignificant when fund performance is measured by alpha. Panel B repeats the regressions using the four ESG disclosure categories, where none of the four categories is significantly related to subsequent fund performance.

Next, we examine time-series variation by estimating Equation (3) separately for the pre- and post-Paris Agreement periods. For brevity, we focus on fund alphas and report the results in Table 9. Columns 1 and 2 examine the overall ESG disclosure during the pre- and post-Paris Agreement periods. Interestingly, we find a sharp contrast: ESG disclosure predicts significantly higher fund performance in the pre-Paris Agreement period, but such association disappears in the post-Paris Agreement period.

Columns 3 and 4 of Table 9 report results for different categories of ESG disclosures in the sub-periods. Funds making *Opportunistic* ESG disclosures earn significantly higher future returns in the per-Paris Agreement period, consistent with an informational advantage before ESG considerations became widely recognized. The six-month Carhart alpha is 0.5% (with a *t*-statistic of 2.47) , which is economically significant given that the sample average is -0.87%. This relation, however, disappears in the post-Paris Agreement period, in which *Opportunistic* ESG disclosures

are no longer linked with superior subsequent performance. χ^2 tests confirm that the pre-post difference in coefficients is statistically significant at the 5% level, consistent with the view that ESG-related informational advantage is more salient prior to the Paris Agreement. Meanwhile, the coefficients on the other three categories are insignificant in both subperiods, indicating that *Opportunistic* ESG disclosures, which emphasize financial returns, have distinct associations with future fund returns relative to other types of ESG disclosures.

5. REVISIT GREENWASHING AND FUND INCENTIVES

5.1 Revisit Greenwashing: ESG Disclosure Categories and Future ESG Performance

In Section 3.4, the results based on overall ESG disclosures suggest potential greenwashing in mutual funds' ESG disclosures. In this section, we examine greenwashing more granularly by evaluating realized ESG outcomes across the four disclosure categories. Specifically, we test whether funds' realized ESG outcomes are consistent with the substantive content of their ESG disclosures.

We repeat the analysis in Table 5, replacing the overall *ESG* indicator with indicator variables for the four disclosure categories. Table 10 shows sharply divergent patterns across disclosure categories. First, the coefficient on *Opportunistic* is negative and statistically significant in the ESG score regression (Column 1), suggesting that funds' portfolios become *less* ESG-oriented following value-motivated ESG disclosure. Columns 2 to 4 further show that this decline is driven by lower in E and S scores rather than G scores. Using the portfolio firms' emission control as an alternative outcome (Column 5), we continue to find a decline in ESG performance following *Opportunistic* ESG disclosures.

Second, the coefficient on *Impact* is positive and marginally insignificant (t-statistic 1.63) in the ESG score regression, and significantly positive in the regressions of E and S scores. These

results suggest that funds become more ESG-oriented following values-motivated ESG disclosures. Third, the coefficient on *Mention* is statistically insignificant across all specifications, consistent with the lack of substantive changes in portfolio ESG characteristics when ESG considerations are referenced without meaningful elaboration. Finally, the coefficient on *Exclusionary* is insignificant across all specifications, probably due to the rarity of Exclusionary disclosures in our sample.

Overall, Table 10 shows that realized ESG outcomes vary systematically with the content of funds' ESG disclosures. *Opportunistic* disclosures do not entail commitments to improving ESG outcomes, in line with a primary objective of maximizing financial returns rather than advancing ESG performance. In contrast, *Impact* disclosures are associated with realized improvements in ESG outcomes, consistent with the stated objectives in shareholder letters. Additionally, the muted ESG actions after *Mention Only* ESG disclosures are consistent with the fact that these disclosures do not describe any specific ESG strategies. These divergences underscore the importance of distinguishing among ESG disclosure types when assessing greenwashing and suggesting that greenwashing may be more nuanced, and potentially less pervasive, than previous studies that do not differentiate disclosure content.

5.2 Trade-Offs in Fund ESG Disclosure

We have shown that ESG-related disclosures in shareholder letters, especially value-motivated ESG disclosures, can generate positive flow effects. This raises a natural question: why don't all mutual funds disclose such information to attract inflows? ESG disclosures can be viewed through the lens of a persuasion game (Milgrom, 1981), in which fund managers selectively release information to influence investor beliefs. Managers make voluntary disclosures only when the perceived benefits exceed the proprietary costs (Verrecchia, 1983). This cost-benefit tradeoff creates incentives for selective or exaggerated disclosure, including greenwashing.

In addition to potential litigation and reputational risks arising from SEC scrutiny,[24] managers may face investor backlash when disclosed ESG information fails to translate into realized financial performance, given our earlier evidence that investor responses are financially motivated. Specifically, if a fund makes *Opportunistic* ESG disclosure but subsequently underperforms, investors may revise their expectations downward, potentially resulting in outflows. To explore this idea, we construct a dummy variable, $I(Performance_{i,t,t+3}<Med)$, which equals one if the fund's three-month cumulative performance post-shareholder-letter falls below the sample median, and zero otherwise. We then estimate the following regression:

$$\begin{aligned} Flow_{i,t+4} = {} & \beta_1 \times Opportunistic_{i,t} \times I(Performance_{i,t,t+3} < Med) \\ & + \beta_2 \times Exclusionary_{i,t} \times I(Performance_{i,t,t+3} < Med) \\ & + \beta_3 \times Impact_{i,t} \times I(Performance_{i,t,t+3} < Med) \\ & + \beta_4 \times Mention_{i,t} \times I(Performance_{i,t,t+3} < Med) \\ & + \beta_5 \times Opportunistic_{i,t} + \beta_6 \times Exclusionary_{i,t} + \beta_7 \times Impact_{i,t} + \beta_8 \times Mention_{i,t} \\ & + \beta_9 \times I(Performance_{i,t,t+3} < Med) + \gamma Controls_{i,t-1} + FE + \varepsilon_{i,t} \end{aligned} \tag{4}$$

where the dependent variable is fund flows in the fourth month following the shareholder events. The keep independent variables are the interactions of $I(Performance_{i,t,t+3}<Med)$ and the four category indicators of ESG disclosures. The interaction terms capture flow responses in the fourth month conditional on both disclosure type and subsequent performance realization. For robustness, we measure fund performance using raw return, market-adjusted return, and Carhart alpha.

Table 11 reports the regression results. The coefficient on *Opportunistic* is positive and statistically significant, consistent with our pervious findings of the flow benefit from Opportunistic ESG disclosure (Table 6). The coefficient on $I(Performance_{i,t,t+3}<Med)$ is significantly negative, consistent with the well-documented relation between poor fund

[24] BNY Mellon has been fined $1.5 million for ESG misstatements and omissions by the US Securities and Exchange Commission (SEC) in May 2022. Goldman Sachs has also been fined $4.0 million for misleading customers about ESG investment in November 2022.

performance and lower subsequent flows. Importantly, the interaction term *Opportunistic*× *I(Performance*$_{i,t,t+3}$*<Med)* is negative and statistically significant across all specifications, indicating that funds making *Opportunistic* ESG disclosure experience *larger* outflows when subsequent fund performance falls short of expectations. In other words, *Opportunistic* ESG disclosure amplifies investor sensitivity to underperformance. Taken together, the results are consistent with an equilibrium in which *Opportunistic* disclosure can attract inflows but also expose funds to heightened downside risk when performance disappoints. This tradeoff may help explain why not all funds voluntarily disclose ESG information despite of its potential inflow benefits: fund mangers may rationally weight the risk of future outflows against the short-term gains from disclosure.

6. CONCLUSION

In this paper, we analyze ESG-related information disclosed in mutual fund shareholder letters and examine investor responses to these disclosures. We find that, on average, funds disclosing ESG information in their shareholder letters experience subsequent inflows relative to funds whose letters contain no ESG disclosure. At the aggregate level, ESG disclosures are not followed by improvements in realized ESG outcomes, which appears consistent with concerns about greenwashing.

Once classifying ESG disclosure into four categories, we show that the flow effects are primarily driven by *Opportunistic* ESG disclosure, consistent with a value-based motivation of mutual fund investors. Additionally, funds making *Opportunistic* ESG information outperform only in the pre-Paris Agreement period, when such disclosures likely reflect an informational advantage. Furthermore, funds with different types of ESG disclosure exhibit markedly different ESG outcomes: *Opportunistic* disclosures are associated with lower subsequent ESG scores of

portfolio firms, whereas *Impact* disclosures are associated with higher ESG scores. This finding suggests that concerns about greenwashing may be overstated when the substantive content of ESG disclosure is taken into account, as *Opportunistic* disclosures do not purport to improve ESG performance. Finally, we highlight a trade-off faced by fund managers: while *Opportunistic* ESG disclosure attracts inflows, it also exposes funds to larger outflows when subsequent fund returns disappoint. This trade-off helps explain why not all funds choose to disclose ESG information despite its potential flow benefits.

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Figure 1
Residual Flow Difference Before and After Disclosure Date

The figures below show the average difference in residual flows between treated funds (funds with ESG shareholder letters) and their matched controls 5 months before and after the disclosure date. Residual flows are the regression residuals after regressing flow on fund characteristics used in Table 2. For each event period, differences in residual flows are calculated by subtracting the residual flows of control funds from the residual flows of their treated funds. The dots indicate the average of these differences at each event date. The linear plots and the 95% confidence intervals are obtained by fitting these dots before and after disclosing shareholder letters.

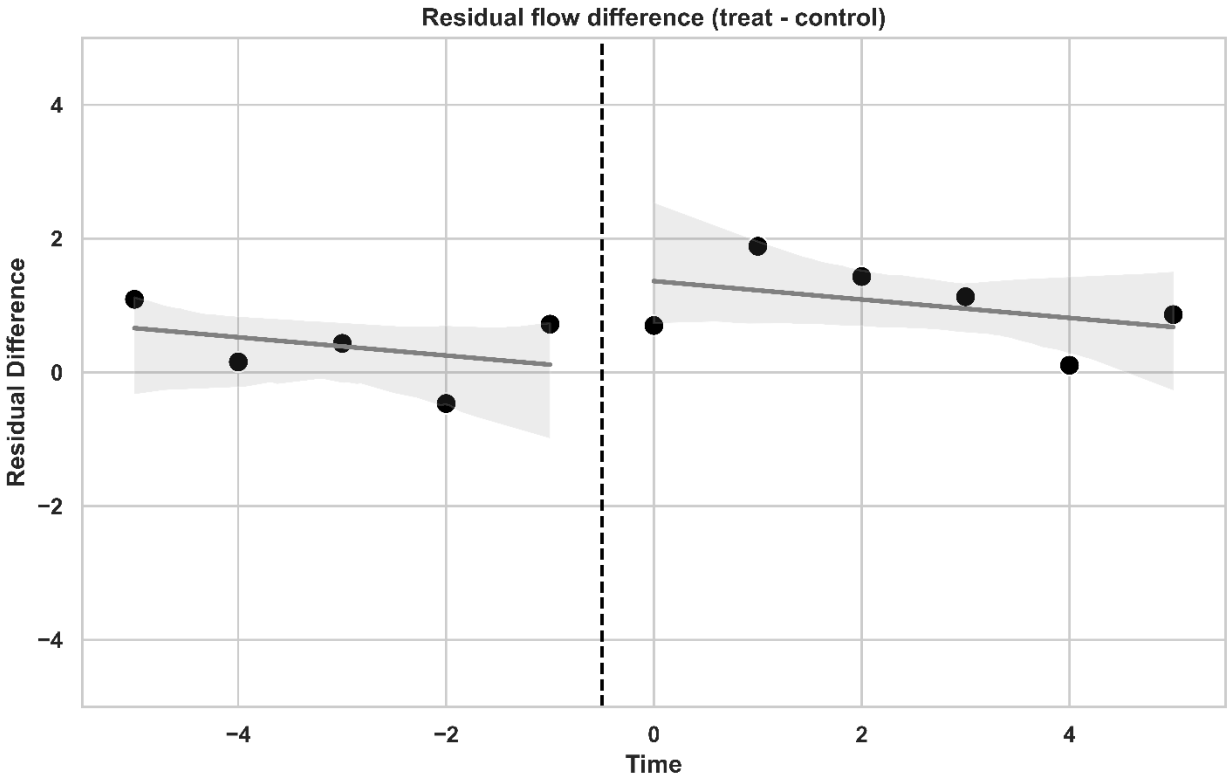


Figure 2
The Dynamic Impact of the ESG Disclosure on Fund Flows

This figure illustrates the dynamic effects of ESG shareholder letters on mutual fund monthly flows using the LP-DID approach of Dude, Girardi, Jorda, and Taylor (2024). The solid dots plot the estimated coefficients, with one month before disclosure (t = -1) as the reference period. The vertical bars represent two-sided 90% confidence intervals. Panel A presents the dynamic effects without control variables, while panel B presents the results with control variables. In panels C and D, we use not-yet treated and never-treated units as comparison groups respectively. Control variables are the same as used in column 3 of Table 2. Detailed definitions of all variables are provided in Appendix A. All regressions control for fund and year-month fixed effects, with standard errors clustered at the fund level.

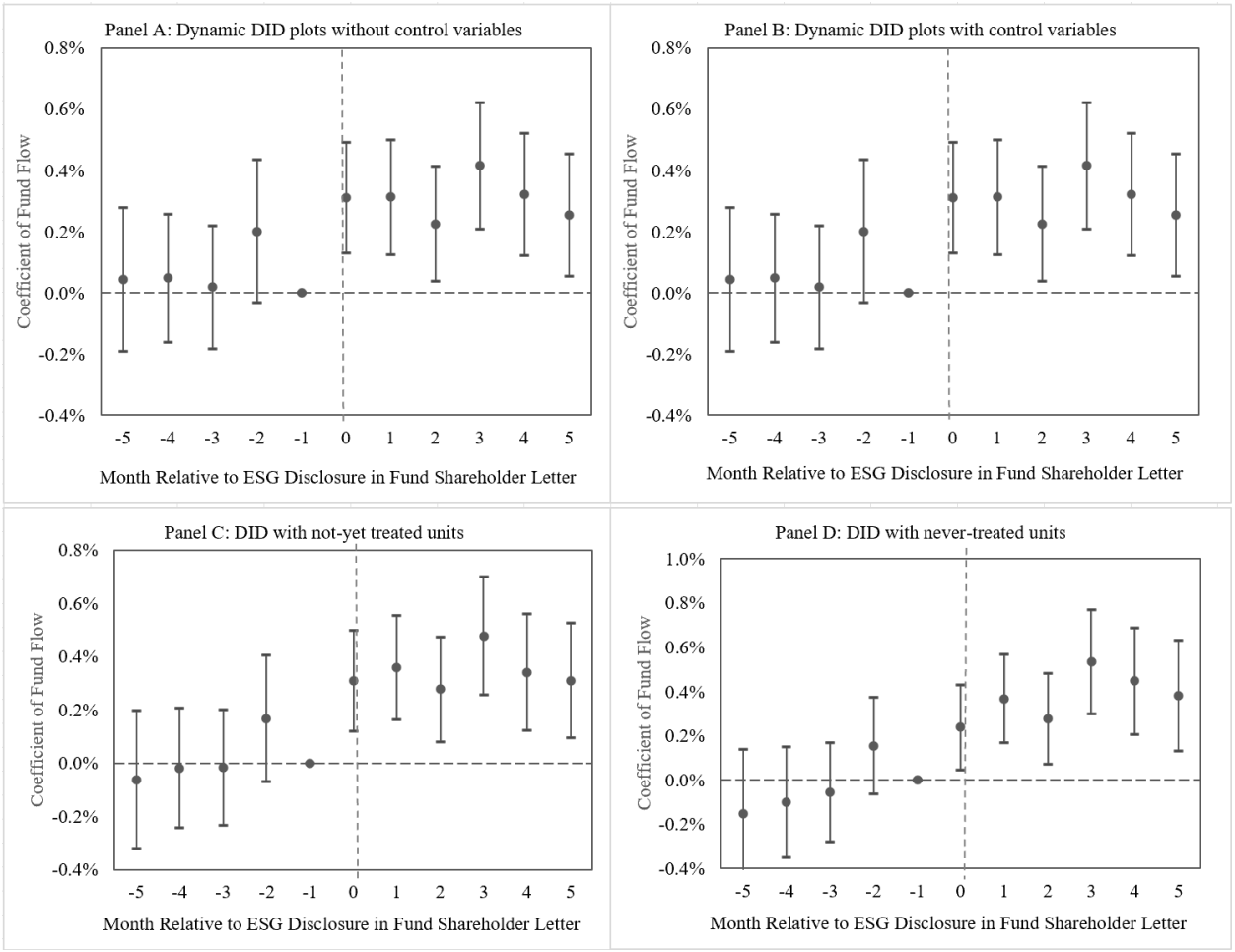


Table 1
Summary Statistics

This table presents the summary statistics of our sample. The sample consists of 43,523 events of shareholder letters from 2,455 U.S. actively managed equity mutual funds, covering the period from January 2006 to December 2024. We report the mean, standard deviation, 25th percentile (Q25), median (Q50), and 75th percentile (Q75) for each variable. Detailed definitions of all variables are provided in Appendix A.

Variables	Obs.	Mean	SD	Q25	Median	Q75
Shareholder Letter Variables						
ESG	43,523	0.19	0.39	0.00	0.00	0.00
Opportunistic	43,523	0.03	0.17	0.00	0.00	0.00
Exclusionary	43,523	0.00	0.04	0.00	0.00	0.00
Impact	43,523	0.01	0.11	0.00	0.00	0.00
Mention	43,523	0.10	0.30	0.00	0.00	0.00
Letter Length	43,523	8.16	1.89	6.72	7.83	9.45
Fund Variables						
$Flow_{i,t}$ (%)	43,523	-0.29	4.03	-1.49	-0.53	0.50
$Flow_{i,t+1,t+3}$(%)	43,185	-0.33	11.14	-4.36	-1.70	1.44
$Flow_{i,t+1,t+6}$ (%)	43,126	0.57	22.74	-8.50	-3.42	3.10
$Ret_{i,t+1,t+6}$(%)	43,155	5.01	13.62	-1.50	5.88	12.28
Mkt-adjusted $Ret_{i+1,t,t+6}$(%)	43,155	-0.71	6.06	-3.56	-0.75	2.05
Carhart $Alpha_{i+1,t,t+6}$ (%)	42,788	-0.87	4.01	-3.02	-0.81	1.31
Risk (%)	43,155	2.11	3.96	0.20	0.76	2.16
Expense Ratio (%)	43,523	1.05	0.36	0.85	1.02	1.25
Fund Size (log)	43,523	5.86	1.97	4.50	5.93	7.25
Fund Age (log)	43,523	2.72	0.70	2.34	2.83	3.20
Family Size (log)	42,767	8.86	2.38	7.55	8.97	10.41
Family Age (log)	42,889	3.31	0.56	3.02	3.35	3.77
Holding similarity	35,729	0.91	0.09	0.89	0.94	0.97
ESG Variables						
ESG Self-Label	43,523	0.02	0.13	0.00	0.00	0.00
Fund-level ESG Score	37,495	0.52	0.14	0.41	0.54	0.64
Fund-level E Score	37,495	0.44	0.19	0.27	0.47	0.60
Fund-level S Score	37,495	0.55	0.14	0.43	0.56	0.66
Fund-level G Score	37,495	0.56	0.10	0.49	0.57	0.64
Fund-level Emission Control	37,495	0.47	0.23	0.27	0.51	0.66

Table 2
ESG Disclosure and Fund Flows

This table presents the baseline results on the flow effects of ESG disclosures in mutual fund shareholder letters. The sample include 42,169 events of shareholder letters from January 2006 to December 2024. The dependent variables are the three- or six-month cumulative fund flows following shareholder letters. The main independent variable, *ESG*, equals one if the shareholder letter contains ESG-related information, and zero otherwise. Control variables include past performance – measured as raw return (columns 1 and 4), market-adjusted return (columns 2 and 5), and Carhart four-factor alpha (columns 3 and 6) – as well as past risk, past flow, expense ratio, fund size, fund age, family size, family age, ESG self-label, and letter length. Detailed definitions are in Appendix A. All specifications include fund fixed effects and year-month fixed effects. The *t*-statistics are based on standard errors clustered at the fund level. Superscripts *, **, and *** indicate statistical significance at 10%, 5% and 1% level (two-tailed), respectively.

Dep. Var.	**Future 3-Month Flows**			**Future 6-Month Flows**		
Performance	Raw	Mkt-adj	Alpha	Raw	Mkt-adj	Alpha
	(1)	(2)	(3)	(4)	(5)	(6)
ESG	**0.004*****	**0.004*****	**0.004*****	**0.006****	**0.006****	**0.006****
	(2.71)	**(2.69)**	**(2.72)**	**(2.36)**	**(2.34)**	**(2.34)**
Performance	0.192***	0.193***	0.299***	0.380***	0.382***	0.611***
	(11.37)	(11.27)	(16.45)	(16.03)	(15.43)	(19.08)
Risk	0.018	0.063*	0.146***	-0.077	0.013	0.177***
	(0.48)	(1.80)	(5.09)	(-1.54)	(0.27)	(3.68)
Flow	0.128***	0.128***	0.127***	0.227***	0.227***	0.226***
	(20.69)	(20.67)	(19.89)	(17.03)	(17.03)	16,38)
Expense	-3.086***	-3.090***	-3.124***	-8.059***	-8.068***	-8.094***
	(-4.92)	(-4.93)	(-4.97)	(-5.78)	(-5.78)	(-5.81)
Fund Size	-0.023***	-0.023***	-0.022***	-0.067***	-0.067***	-0.065***
	(-17.61)	(-17.58)	(-17.14)	(-22.68)	(-22.66)	(-22.13)
Fund Age	-0.024***	-0.024***	-0.021***	-0.052***	-0.052***	-0.044***
	(-5.34)	(-5.35)	(-4.47)	(-4.59)	(-4.59)	(-3.78)
Family Size	0.004***	0.004***	0.004***	0.008***	0.008***	0.008***
	(3.11)	(3.12)	(3.21)	(2.67)	(2.68)	(2.71)
Family Age	0.001	0.001	0.001	0.016	0.016	0.013
	(0.22)	(0.23)	(0.09)	(1.07)	(1.07)	(0.88)
ESG Fund	0.001	0.001	-0.000	0.016	0.017	0.016
	(0.07)	(0.11)	(-0.05)	(0.57)	(0.60)	(0.57)
Letter Length	-0.001*	-0.001*	-0.001*	-0.002***	-0.002***	-0.002**
	(-1.95)	(-1.94)	(-1.84)	(-2.62)	(-2.61)	(-2.45)
Fund FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	42,169	42,169	41,849	40,666	40,666	40,333
Adj. R^2	0.22	0.22	0.21	0.25	0.25	0.25

Table 3
ESG Disclosure and Fund Flows: Robustness Check

This table reports robustness tests for the baseline results in Table 2. The dependent variable is the cumulative flow over the subsequent three months. The key independent variable, *ESG,* equals one if fund *i*'s shareholder letter at time *t* contains ESG-related information, and zero otherwise. Panel A includes additional control variables. Column 1 adds a measure of pre-letter holding changes, calculated as the cosine similarity of portfolio weights between quarter *q* - 2 and quarter *q* - 1, where *q* - 1 is the most recent portfolio holdings before the shareholder letter, and *q* - 2 is the prior quarter's holdings. Column 2 adds a measure of change in shareholder letter's content relative to the prior letter, calculated as the textual cosine similarity between the focal letter and the previous shareholder letter. Column adds two measures of the positive and negative sentiment of shareholder letter, calculated as the percentage of positive and negative words based on Loughran and McDonald's (2011) dictionary, respectively. Panel B uses alternative specifications. Column 1 presents the result using a propensity score matching (PSM) sample, which is constructed using logistic regressions with the following matching variables: Carhart four-factor loadings, cumulative Carhart alpha over the prior six months, cumulative flow over the prior six months, expense ratio, fund size, and fund age. Column 2 imposes category fixed effect and column 3 includes reporting date fixed effect. Control variables are the same as used in column 3 of Table 2. All specifications include fund fixed effects and year-month fixed effects. The *t*-statistics are based on standard errors clustered at the fund level. Superscripts *, **, and *** indicate statistical significance at 10%, 5% and 1% level (two-tailed), respectively.

Panel A: Controls for Text and Holding Changes			
Dep. Var	**Future 3-Month Flows**		
Added Controls	Holding Changes	Letter Content Changes	Control for Sentiment
	(1)	(2)	(3)
ESG	**0.004*** **	**0.004*** **	**0.004*** **
	(2.66)	**(2.83)**	**(2.74)**
Controls	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes
Time FE	Yes	Yes	Yes
Observations	34,603	40,877	41,849
Adj. R^2	0.21	0.21	0.21
Panel B: Alternative Specifications			
Dep. Var	**Future 3-Month Flows**		
	Propensity Score Matching	Include Style FE	Use Alternative Time FE
	(1)	(2)	(3)
ESG	**0.005*** **	**0.004*** **	**0.004*** **
	(2.83)	**(2.65)**	**(2.72)**
Controls	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes
Time FE	Yes	Yes	Yes
Style FE	No	Yes	Yes
Observations	14,860	41,846	41,846
Adj. R^2	0.24	0.21	0.21

Table 4
DiD Analysis: Parallel Trends and Dynamic effects

This table presents dynamic effects of ESG disclosure in shareholder letters on mutual fund flows, using the estimation approach in Dube, Girardi, Jordà and Taylor (2025). Regressions are estimated at the fund-month level. The dependent variable is fund *i*'s flow in month *t*. ESG^{Pre} and ESG^{Post} are the pooled estimates before and after disclosing ESG shareholder letters respectively. ESG is an indicator variable for mutual funds with ESG-related shareholder letters (treatment group). Pre5 through Pre2 are indicator variables for observations that fall during 2 through 5 months prior to the event date. Post1 through Post5 are indicator variables for observations that fall during 1 through 5 months after disclosing ESG-related shareholder letter. Columns 1 and 2 report the pooled estimates without and with control variables respectively. Columns 3 and 4 report the event study estimates without and with control variables respectively. Control variables are the same as those used in column 3 of Table 2. The sample period is from January 2006 to December 2024. Both fund and year-by-month fixed effects are imposed. The *t*-statistics are based on standard errors clustered at fund level. Superscripts *, **, and *** indicate statistical significance at 10%, 5% and 1% level (two-tailed), respectively.

Dep. Var.	**Monthly Flows**			
	Pooled Estimates		Event Study Estimates	
	(1)	(2)	(3)	(4)
ESG^{Pre}	0.001	0.000		
	(0.66)	(0.35)		
ESG^{Post}	**0.003*** **	**0.003*** **		
	(2.92)	**(2.93)**		
ESG × Pre5			0.000	-0.000
			(0.30)	(-0.10)
ESG × Pre4			0.000	0.000
			(0.37)	(0.23)
ESG × Pre3			0.000	0.000
			(0.15)	(0.15)
ESG × Pre2			0.002	0.002
			(1.42)	(1.35)
ESG × Post0			**0.003*** **	**0.003*** **
			(2.82)	**(2.78)**
ESG × Post1			**0.003*** **	**0.003*** **
			(2.72)	**(2.63)**
ESG × Post2			**0.002** **	**0.002** *
			(1.97)	**(1.82)**
ESG × Post3			**0.004*** **	**0.004*** **
			(3.32)	**(3.26)**
ESG × Post4			**0.003*** **	**0.003** **
			(2.63)	**(2.34)**
ESG × Post5			**0.003** **	**0.003** **
			(2.10)	**(2.28)**
Controls	No	Yes	No	Yes
Fund FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Observations	143,319	143,319	143,319	143,319

Table 5
Fund ESG Disclosure and Future ESG Performance

This table presents the regression results for fund-level ESG scores three months after the disclosure of ESG-related shareholder letters. The sample period is from January 2006 to December 2024, and regressions are estimated at the fund-month level. The dependent variables are the future three-month overall ESG score (column 1), E score (column 2), S score (column 3), and G score (column 4), and Emission control score (column 5), all calculated based on portfolio holding weights. The main independent variable is *ESG*, an indicator variable which equals 1 if the shareholder letter contains ESG-related content. Control variables are the same as those in column 3 of Table 2. All regressions include fund and year-month fixed effects. Standard errors are clustered at the fund level. Superscripts *, **, and *** indicate statistical significance at 10%, 5% and 1% level (two-tailed), respectively.

Dep. Var.	ESG Score	E Score	S Score	G Score	Emission Control
	(1)	(2)	(3)	(4)	(5)
ESG	-0.001	-0.001	-0.000	-0.001	-0.002
	(-1.00)	(-1.31)	(-0.53)	(-0.90)	(-1.46)
Controls	Yes	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Observations	36,230	36,230	36,230	36,230	36,230
Adj. R^2	0.93	0.92	0.92	0.83	0.92

Table 6
The Flow Effect of Mutual Fund ESG Disclosure: Subcategory Analysis

This table reports the flow effects of different categories of ESG information disclosed in shareholder letters. ESG content is manually classified into four categories: *Opportunistic*, where ESG information is used primarily as a tool to adjust the risk-return profile; *Exclusionary*, where ESG criteria are applied to restrict trading strategies; *Impact*, where both financial performance and ESG outcomes are emphasized; and *Mention*, where ESG-related terms are mentioned without further explanation. The dependent variables are the cumulative flows over the subsequent three and six months. The key independent variables are the four category indicators. Control variables are the same as those used in column 3 of Table 2, where past performance is measured as raw return in columns 1 and 4, market-adjusted return in columns 2 and 5, and Carhart four-factor alpha in columns 3 and 6. The sample period is from January 2006 to December 2024. All regressions include fund and year-month fixed effects. The *t*-statistics are based on standard errors clustered at the fund level. Superscripts *, **, and *** indicate statistical significance at 10%, 5% and 1% level (two-tailed), respectively.

Dep. Var.	Future 3-month flows			Future 6-month flows		
Performance	Raw	Mkt-adj	Alpha	Raw	Mkt-adj	Alpha
	(1)	(2)	(3)	(4)	(5)	(6)
Opportunistic	**0.008*****	**0.008*****	**0.008*****	**0.011****	**0.011****	**0.011****
	(2.86)	**(2.85)**	**(2.81)**	**(2.15)**	**(2.13)**	**(2.15)**
Exclusionary	0.008	0.008	0.006	0.012	0.011	0.007
	(0.80)	(0.78)	(0.58)	(0.62)	(0.60)	(0.36)
Impact	-0.007*	-0.007*	-0.006	-0.010	-0.010	-0.009
	(-1.69)	(-1.70)	(-1.62)	(-1.23)	(-1.25)	(-1.17)
Mention	0.002	0.002	0.001	0.004	0.004	0.003
	(1.10)	(1.09)	(0.94)	(1.29)	(1.29)	(1.09)
Fund FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	42,169	42,169	41,849	40,666	40,666	40,333
Adj. R^2	0.22	0.22	0.21	0.25	0.25	0.25

Table 7
ESG Flow Effects Before and After the Paris Agreement

This table reports subsample regressions before and after the Paris Agreement (December 2015). The sample is divided into the pre-Paris Agreement period (before 2016) and the post-Paris Agreement period (2016 onward), and the baseline regressions are re-estimated for each subsample. The dependent variable is the cumulative flow over the subsequent three months. In columns 1 and 2, the main independent variable is *ESG*, which equals one if fund *i*'s shareholder letter at time *t* contains ESG-related information, and zero otherwise. Columns 3 and 4 report results where the independent variables are indicators for the four categories of ESG information. The χ^2 statistics testing the difference of coefficients on the *ESG* dummy (columns 1 and 2) and on the *Opportunistic* dummy (columns 3 and 4) are also reported. Control variables are the same as those in column 3 of Table 2. All regressions include fund and year-month fixed effects. The *t*-statistics are reported in parenthesis which are based on standard errors clustered at the fund level. Superscripts *, **, and *** indicate statistical significance at 10%, 5% and 1% level (two-tailed), respectively.

Dep. Var.	Future 3-month flows			
	Pre-Paris	Post-Paris	Pre-Paris	Post-Paris
	(1)	(2)	(3)	(4)
ESG	**0.001**	**0.006*****		
	(0.27)	**(3.32)**		
Opportunistic			**0.000**	**0.013*****
			(0.02)	**(3.32)**
Exclusionary			-0.006	0.001
			(-0.35)	(0.14)
Impact			-0.012	-0.006
			(-1.60)	(-0.98)
Mention			0.002	0.002
			(0.54)	(0.93)
χ^2 test: *p*-value	0.077		0.024	
Controls	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Observations	20,494	19,726	20,494	19,726
Adj. R^2	0.23	0.23	0.23	0.23

Table 8
ESG Disclosures and Future Fund Performance

This table reports the financial performance of mutual funds conditional on disclosing ESG-related shareholder letters. The dependent variables are the cumulative six-month raw return in column 1, cumulative six-month market-adjusted return in column 2, and cumulative six-month Carhart alpha in column 3. Panel A uses the ESG indicator as the main independent variable, while Panel B presents results with the four ESG categories. Control variables are the same as those in column 3 of Table 2. All regressions include fund and year-month fixed effects. The *t*-statistics are based on standard errors clustered at the fund level. Superscripts *, **, and *** indicate statistical significance at 10%, 5% and 1% level (two-tailed), respectively.

Panel A: Overall ESG Disclosure			
Dep. Var.	Raw Return	Mkt-adj. Return	Alpha
	(1)	(2)	(3)
ESG	0.002**	0.002**	0.001
	(2.11)	(2.46)	(1.13)
Controls	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes
Time FE	Yes	Yes	Yes
Observations	40,333	40,333	40,333
Adj. R^2	0.81	0.12	0.09
Panel B: ESG Disclosure by Category			
Dep. Var.	Raw Return	Mkt-adj. Return	Alpha
	(1)	(2)	(3)
Opportunistic	0.004	0.004*	0.001
	(1.61)	(1.74)	(0.45)
Exclusionary	-0.001	-0.001	0.008*
	(-0.20)	(-0.03)	(1.83)
Impact	0.005	0.004	-0.003
	(1.03)	(0.80)	(-1.25)
Mention	0.001	0.001	0.000
	(0.48)	(0.99)	(0.34)
Controls	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes
Time FE	Yes	Yes	Yes
Observations	40,333	40,333	40,333
Adj. R^2	0.81	0.12	0.09

Table 9

ESG Disclosure and Future Fund Performance: Pre- and Post- Paris Agreement Periods

This table reports subsample regressions before and after the Paris Agreement (December 2015). The sample is divided into the pre-Paris Agreement period (before 2016) and the post-Paris Agreement period (2016 onward), and the baseline regressions are re-estimated for each subsample. The dependent variable is the cumulative Carhart alpha over the subsequent six months. In columns 1 and 2, the main independent variable is *ESG*, which equals one if fund *i*'s shareholder letter at time *t* contains ESG-related information, and zero otherwise. Columns 3 and 4 report results where the independent variables are indicators for the four categories of ESG information. The χ^2 statistics testing the difference of coefficients on the *ESG* dummy (columns 1 and 2) and on the *Opportunistic* dummy (columns 3 and 4) are also reported. Control variables are the same as those in column 3 of Table 2. All regressions include fund and year-month fixed effects. The *t*-statistics are reported in parenthesis which are based on standard errors clustered at the fund level. Superscripts *, **, and *** indicate statistical significance at 10%, 5% and 1% level (two-tailed), respectively.

Dep. Var.	Future 6-month Cum. Alpha			
	Pre-Paris	Post-Paris	Pre-Paris	Post-Paris
	(1)	(2)	(3)	(4)
ESG	**0.003*****	**-0.000**		
	(2.97)	**(-0.52)**		
Opportunistic			**0.005****	**-0.002**
			(2.47)	**(-0.76)**
Exclusionary			0.005	0.009
			(0.90)	(1.49)
Impact			0.002	-0.006
			(0.47)	(-1.62)
Mention			0.001	-0.001
			(1.05)	(-0.50)
χ^2 test: *p*-value	0.012		0.029	
Controls	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Observations	20,494	19,726	20,494	19,726
Adj. R^2	0.12	0.11	0.12	0.11

Table 10
Fund ESG Disclosure and Future ESG Performance: Subcategory Analysis

This table presents the regression results for the fund-level ESG scores three months after the disclosure of ESG-related shareholder letters. The sample period is from January 2006 to December 2024, and regressions are estimated at the fund-month level. The dependent variables are the future three-month overall ESG score (column 1), E score (column 2), S score (column 3), and G score (column 4), and Emission control score (column 5), all calculated based on portfolio holding weights. The main independent variables are the four category indicators. Control variables are the same as those in column 3 of Table 2. All regressions include fund and year-month fixed effects. Standard errors are clustered at the fund level. Superscripts *, **, and *** indicate statistical significance at 10%, 5% and 1% level (two-tailed), respectively.

Dep. Var.	ESG Score	E Score	S Score	G Score	Emission Control
	(1)	(2)	(3)	(4)	(5)
Opportunistic	**-0.003****	**-0.005****	**-0.004*****	0.000	**-0.007*****
	(-2.08)	**(-2.36)**	**(-2.78)**	(0.31)	**(-2.76)**
Exclusionary	-0.006	-0.006	-0.009	-0.006	-0.003
	(-1.49)	(-1.17)	(-1.59)	(-0.94)	(-0.36)
Impact	0.004	**0.007***	**0.006****	-0.000	0.005
	(1.63)	**(1.94)**	**(2.25)**	(-0.01)	(1.27)
Mention	-0.001	-0.001	-0.000	-0.001	-0.001
	(-0.62)	(-0.89)	(-0.42)	(-0.54)	(-0.64)
Controls	Yes	Yes	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Observations	33,911	33,911	33,911	33,911	33,911
Adj. R^2	0.93	0.92	0.92	0.84	0.92

Table 11

Interactive Effects of ESG Disclosures and Fund Performance on Long-Term Flows

This table presents the interactive effects of ESG disclosure and fund performance on long-term fund flows. The sample period is from January 2006 to December 2024. The dependent variable, $Flow_{i,t+4}$, denotes the monthly flow in the fourth month after disclosure. The independent variables are indicators for the four categories of ESG information; $I(Ret_{i,t,t+3}<median)$, an indicator variable equal to one if fund *i*'s financial performance over the subsequent three months falls below the median, and zero otherwise; and their interaction terms, which capture whether funds with a specific type of ESG disclosure experience larger outflows in the fourth month when their three-month post-disclosure performance is poor. Financial performance over the three months following disclosure is measured by raw return (column 1), market-adjusted return (column 2), and Carhart alpha (column 3). Control variables are the same as in column 3 of Table 2. All regressions include fund and year-by-month fixed effects. The *t*-statistics are based on standard errors clustered at the fund level. Superscripts *, **, and *** indicate statistical significance at 10%, 5% and 1% level (two-tailed), respectively.

Dep. Var.	$Flow_{i,t+4}$		
Performance	Raw	Mkt-adj	Alpha
	(1)	(2)	(3)
Opportunistic×I($Ret_{i,t,t+3}$<median)	**-0.003*****	**-0.003*****	**-0.002****
	(-3.36)	**(-3.07)**	**(-2.13)**
Exclusionary×I($Ret_{i,t,t+3}$<median)	-0.004	-0.004	-0.001
	(-1.45)	(-1.41)	(-0.67)
Impact×I($Ret_{i,t,t+3}$<median)	-0.001	-0.001	0.001
	(-0.90)	(-0.81)	(0.93)
Mention×I($Ret_{i,t,t+3}$<median)	-0.000	-0.000	0.001
	(-0.48)	(-0.32)	(1.10)
I($Ret_{i,t,t+3}$<median)	-0.002***	-0.002***	-0.001**
	(-5.75)	(-5.66)	(-2.01)
Opportunistic	0.003***	0.002***	0.002**
	(3.14)	(2.99)	(2.42)
Exclusionary	0.001	0.001	-0.000
	(0.68)	(0.63)	(-0.16)
Impact	-0.001	-0.001	-0.002*
	(-0.83)	(-0.89)	(-1.89)
Mention	0.000	0.000	-0.000
	(0.87)	(0.77)	(-0.09)
Controls	Yes	Yes	Yes
Fund FE	Yes	Yes	Yes
Time FE	Yes	Yes	Yes
Observations	66,658	66,658	66,658
Adj. R^2	0.21	0.21	0.21

Appendix A
Variable Definitions

Variable Name	Definition
ESG Disclosure Data (Source: Edgar)	
ESG	An indicator variable that equals one if a shareholder letter contains at least one ESG-related sentence and zero otherwise. We classify a sentence as ESG-related if FINBERT-ESG assigns it to one of the three ESG labels – Environmental, Social, or Governance.
Opportunistic	An indicator variable, which takes a value of one if shareholder letter contains opportunistic ESG information. Opportunistic ESG information refers to the use of ESG considerations to maximize risk-return profiles rather than any intrinsic ESG preferences
Exclusionary	An indicator variable, which takes a value of one if shareholder letter contains exclusionary ESG information. Exclusionary ESG information refers to optimizing risk-return profiles subject to ESG-related constraints.
Impact	An indicator variable, which takes a value of one if shareholder letter contains impact ESG information. Impact ESG information refers to considering both financial performance and ESG performance.
Mention	An indicator variable, which takes a value of one if shareholder letter contains ESG terms but does not provide any further explanation how they will incorporate such information.
Letter Length	The logarithm of number of words in each shareholder letter
Fund-level data (Source: CRSP, Morningstar, Thomson Reuters)	
Fund size	Fund size is the aggregate value of total net assets (mnav) across all share classes of the same fund. We take the logarithm of fund size. Source: CRSP
Fund returns	The weighted-average of monthly returns (mret) across all share classes. Source: CRSP
Fund risk	Fund risk is calculated as the squared raw return of past six months. Source: CRSP
Flow flows	Fund i's flow at month t is calculated as: $Flow_{i,t} = \frac{TNA_{i,t} - TNA_{i,t-1} \times (1 + R_{i,t})}{TNA_{i,t-1}}$. Source: CRSP
Fund age	Fund age is calculated based on the inception date of the oldest fund share class. We take the logarithm of fund age plus 1. Source: CRSP
Expense ratio	The weighted-average of expense ratios (exp_ratio) across all share classes. Source: CRSP
Family Size	Family size is the sum of total net assets of all the managed funds in the family. We take the logarithm of family size. Source: CRSP

Family Age	Family age in months, estimated as the age of the oldest fund in the family. Source: CRSP
Holding Similarity	Holding similarity is measured by the cosine similarity of portfolio weights between quarters *t* and *t*-1 within the same fund. Source: CRSP and Thomson Reuters

ESG data (Source: Morningstar, Refinitiv, Thomson Reuters)

ESG Scores	Firm-level ESG scores, which measures the company's ESG performance. We construct fund-level ESG scores by calculating the value-weighted ESG scores of holding stocks. Source: Refinitiv
E/S/G Scores	Firm-level E/S/G pillar scores. We construct fund-level E/S/G scores by calculating the value-weighted E/S/G scores of holding stocks. Source: Refinitiv and Thomson Reuters
Emission Control	Firm-level emission reduction score, which measures a company's commitment and effectiveness towards reducing environmental emissions. We construct fund-level emission scores by calculating the value-weighted emission scores of holding stocks. Source: Refinitiv and Thomson Reuters
ESG Self-Label	An indicator variable which equals one if the fund is labeled as an ESG fund in Morningstar Sustainable Funds U.S. Landscape Report, and zero otherwise. Source: Morningstar

Fama–French and Carhart factors (Source: CRSP and Kenneth French data library)

MKT	MKT is the monthly return to the market portfolio minus the monthly return of 30-day Treasury bills.
RF	RF is the monthly return of 30-day Treasury bills
SMB	SMB is the difference between the monthly returns on diversified portfolios of small and large stocks.
HML	HML is the difference between the monthly returns on a diversified portfolio of high and low B/M stocks.
UMD	UMD is the difference between the monthly returns on diversified portfolios of winners and losers.
β_{MK}, β_{HML}, β_{SMB}, β_{MOM}	To estimate the fund's monthly betas, we regress the prior 36 months (i.e., month t - 36 to month t - 1) of fund excess returns (fund returns minus risk-free rate RF) on the factors (MKT, SMB, HML, UMD) to obtain factor loadings. We require at least 12 months of non-missing returns.
CAPM alpha	To estimate the fund's CAPM alpha, we regress the prior 36 months (i.e., month *t-36* to month *t-1*) of fund excess returns (fund returns minus the risk-free rate) on the market excess return (MKT) to obtain the market beta. We require at least 12 months for non-missing returns. Monthly CAPM alphas are the difference between fund excess returns and the product of market excess return and the estimated market beta obtained

	over the prior 36 months.
Fama-French 3-factor alpha	To estimate the fund's Fama-French 3-factor alpha, we regress the prior 36 months of fund excess returns on the Fama-French three factors (MKT, SMB and HML) to obtain factor loadings. We require at least 12 months for non-missing returns. Monthly Fama-French 3-factor alpha is the difference between fund excess returns and the product of factor returns and the corresponding estimated factor loadings obtained over the prior 36 months.
Carhart 4-factor Alpha	To estimate the fund's Carhart 4-factor alpha, we regress the prior 36 months of fund excess returns on the Carhart four factors (MKT, SMB, HML, UMD) to obtain factor loadings. We require at least 12 months of non-missing returns. Monthly alphas are the difference between fund excess returns, and the product of factor returns and the corresponding estimated factor loadings estimated over the prior 36 months.

Appendix B
Examples of ESG-Related Shareholder Letters

Fund Name	Filing Date	Type	Content
Capital Advisors Growth Fund	2006-06-30	Opportunistic	The same can be said of **alternative energy** sources like wind, solar, and conversion technologies (gas-to-liquids; coal-to-liquids and ethanol and bio-diesel produced from agricultural feed stocks). Each of these technologies **may hold merit in the long-run**, but **none represents a near-term solution** to the **reality that global demand for oil** is dangerously close to exceeding the available supply of annual production. … . For now we believe the right side of this trade is to be **"long" energy** by owning companies who **control existing production and reserves of oil, natural gas, and coal**, and by avoiding industries whose profitability is most vulnerable to rising fuel costs.
VP capital Appreciation Fund	2021-02-24	Opportunistic	Declining technology costs and growing environmental concerns have created **opportunities** for utilities to transition power generation from traditional energy sources to renewable sources such as solar and wind. ... However, these transitions will take time and may provide **good investment opportunities** in the interim in both **traditional energy sources** and **new power technologies**.
Schwartz Value Fund	2007-03-02	Exclusionary	We **screen out** companies based on the guidelines established by our Catholic advisory board. This **eliminates from consideration companies** related to abortion, pornography, and those that offer their employees non-marital partner benefits, among others.
Epiphany FFV Fund	2015-07-06	Exclusionary	The focus of the **screening** is to protect the dignity of human life, support and protect employees and their families, and to reasonably safeguard the environment. The **screening is consistent with the USCCB Socially Responsible Investment Guidelines**. Business practices **are screened in four major areas**: Life and Family Exclusions, Social Justice, Environmental Record, and Corporate Governance Practices. The screening process **first excludes companies** with business activities that are prohibited in the life and family exclusions.
Trillium Small Mid Cap Fund	2018-09-06	Impact	We believe this benefits investors, society, and the environment. ... One particular strategy we used this year to hold companies accountable was **asking them to set science-based greenhouse gas (GHG) reduction targets**. ... We are pleased to report that we have had successful **dialogue with** Minerals Technologies, whereby the company initiated a formal review of its greatest environmental impacts, and we

			expect the company to **set GHG reduction targets** as one outcome of this process.
Boston Common U.S. Equity Fund	2015-12-07	Impact	For the first time in over 20 years of UN negotiations, the upcoming 2015 Paris Climate Conference undertakes an aggressive goal: to achieve a legally binding and universal agreement on climate, with the aim of keeping global warming below 2°C. As you will see in the next section, on this "Road to Paris," Boston Common is **collaborating with others to support a strong climate agreement**, one that will include robust goals for targeting greenhouse gas reduction. … Closer to home, Boston Common **became an early signatory to the Montreal Carbon Pledge**, a commitment to annually measure and disclose the carbon footprint of our portfolios.
GMO Quality Series Fund	2019-11-01	Mention Only	Pollution control which could in turn affect these companies such companies also may be significantly affected by technological changes in industries focusing on energy pollution control and **mitigation of global warming** because **society s focus on climate change** is relatively new the emphasis and direction of governmental policies is subject to significant change and rapid technological change could render even new approaches and products.
Wells Fargo Endeavor Select Fund	2020-09-30	Mention Only	The global spread of the coronavirus led country after country to **clamp down on social and business-related activity** in order to contain the virus from **causing even greater devastation and overwhelming health care systems**. This abrupt stoppage of economic activity led to the sharp deceleration of global output, sending economies into a deep contraction.

Appendix C
Supplemental Results: Propensity Score Matching

Table C1
Effectiveness of Propensity Score Matching

This table reports fund characteristics before and after propensity-score matching using one-to-one neighbor matching without replacement. Panel A and panel B show mean differences for the matching covariates of treated funds and control funds, before and after the matching, respectively. Treated funds are those funds with ESG information in their shareholder letters, while control funds are defined as issuing a shareholder letter in the same quarter but without ESG content. The sample period is from January 2006 to December 2024. Detailed variable definitions are provided in Appendix A. Superscripts *, **, and *** indicate statistical significance at 10%, 5% and 1% level (two-tailed), respectively.

Panel A: Before Matching			
	Treated Funds	Control Funds	Difference
β_{MK}	0.994	0.997	-0.003*
β_{SMB}	0.247	0.232	0.014***
β_{HML}	0.019	-0.011	0.030***
β_{MOM}	-0.003	0.002	-0.004**
Carhart $Alpha_{i,t-1,t-6}$	-0.011	-0.008	-0.003***
$Flow_{i,t-1,t-6}$	0.004	0.006	-0.002
Expense Ratio	0.010	0.011	-0.001***
Log(Age)	2.758	2.710	0.049***
Log(Size)	5.998	5.830	0.168***
Panel B: After Propensity Score Matching			
	Treated Funds	Control Funds	Difference
β_{MK}	0.993	0.992	0.001
β_{SMB}	0.240	0.242	-0.002
β_{HML}	0.015	0.017	-0.002
β_{MOM}	-0.002	-0.003	0.001
Carhart $Alpha_{i,t-1,t-6}$	-0.010	-0.010	0.000
$Flow_{i,t-1,t-6}$	-0.000	-0.004	0.004
Expense Ratio	0.010	0.010	0.000
Log(Age)	2.778	2.775	0.003
Log(Size)	6.023	6.004	0.018

Table C2
DiD Analysis with Alternative Propensity Score Matching Sample

This table presents robust DID analyses using an alternative PS–matched sample. We construct our control group using logistic regressions with the following matching variables: Carhart four-factor loadings, cumulative Carhart alpha and raw return over the prior six months, cumulative flow over the prior six months, expense ratio, turnover ratio, fund size, and fund age. Regressions are estimated at the fund-month level. The dependent variable is fund *i*'s flow in month *t*. ESG^{Pre} and ESG^{Post} are the pooled estimates before and after disclosing ESG shareholder letters respectively. ESG is an indicator variable for mutual funds with ESG-related shareholder letters (treatment group). Pre5 through Pre2 are indicator variables for observations that fall during 2 through 5 months prior to the event date. Post1 through Post5 are indicator variables for observations that fall during 1 through 5 months after disclosing ESG-related shareholder letter. Control variables are the same as those used in column 3 of Table 2. The sample period is from January 2006 to December 2024. Both fund and year-by-month fixed effects are imposed. The *t*-statistics are based on standard errors clustered at fund level. Superscripts *, **, and *** indicate statistical significance at 10%, 5% and 1% level (two-tailed), respectively.

Dep. Var.	**Monthly Flows**			
	Pooled Estimates		Event Study Estimates	
	(1)	(2)	(3)	(4)
ESG^{Pre}	0.001	0.000		
	(0.65)	(0.22)		
ESG^{Post}	**0.002****	**0.002****		
	(1.98)	**(2.24)**		
ESG × Pre5			-0.000	-0.001
			(-0.17)	(-0.63)
ESG × Pre4			0.001	0.000
			(0.58)	(0.35)
ESG × Pre3			0.001	0.001
			(0.62)	(0.52)
ESG × Pre2			0.002	0.002
			(1.33)	(1.22)
ESG × Post0			**0.002***	**0.002***
			(1.76)	**(1.70)**
ESG × Post1			**0.003****	**0.003*****
			(2.42)	**(2.68)**
ESG × Post2			**0.002****	**0.002****
			(2.04)	**(2.15)**
ESG × Post3			**0.003****	**0.003****
			(2.15)	**(2.30)**
ESG × Post4			**0.002***	**0.002***
			(1.79)	**(1.94)**
ESG × Post5			**0.002**	**0.002***
			(1.34)	**(1.74)**
Controls	No	Yes	No	Yes
Fund FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Observations	141,106	141,106	141,106	141,106