ESG disclosure and investors' attention: Evidence from Mutual fund prospectuses

Huayu Shi[1], Helen Lu[1], and John B. Lee[1]

[1]The University of Auckland

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Abstract

We study the association between Environmental, Social and Governance (ESG) disclosures in the Principal Investment Strategy (PIS) section of U.S. equity mutual fund prospectuses and their fund flows. Using pre-trained large language models (LLMs) to identify specific and generic ESG disclosures, we find that fund flows increase with specific, but not with generic ESG disclosures. In addition, we find that specific ESG disclosures do not incrementally affect fund following returns, while the fund-performance sensitivity is more pronounced for funds that make longer specific ESG disclosures relative to their peers. We also note that specific ESG disclosures are essential for attracting investment primarily during periods of heightened climate concerns.

1 Introduction

A growing number of investors are focusing on environmental, social, and governance (ESG) concerns, and these concerns have become increasingly influential in resource allocation decisions (Bialkowski & Starks, 2016; Fabrizio et al., 2019; Grewal et al., 2021; Pawliczek et al., 2021). The mounting emphasis on ESG presents fund managers with the opportunity and perhaps the temptation to enhance their prospectus disclosures to demonstrate their commitment to ESG. It is possible for managers to use highly specific and precise language in their ESG disclosures, or use more general boilerplate terms.[1] However, the lack of disclosure requirements for ESG investing makes it difficult to understand which disclosures are associated with a particular ESG strategy.[2] In previous literature, the specificity of financial content has been extensively discussed (e.g. Filzen et al., 2023; Hope et al., 2016), but the specificity of ESG disclosure, particularly in mutual funds, remains under-explored. Are those discretionary ESG disclosures having an effect on the investors' decision? To address this question, we examine whether specific or generic ESG disclosures in mutual funds' prospectuses sway investor decisions more and to uncover the factors influencing their preferences concerning these disclosures.

Utilizing textual analysis, this study introduces a novel methodology for distinguishing between specific and generic ESG disclosures. We concentrate on the "Principal Investment Strategies" (PIS) section of US equity mutual funds' prospectuses.[3] Employing the BART-large model—a pre-trained large language model—we engage in a zero-shot classification task to discern specific and generic ESG disclosures. The initial step involves defining classification labels for "ESG issues," enabling the identification of sentences in the PIS section as either ESG-related or not. Subsequently, the label "Specific ESG issues" is employed to further classify ESG-related sentences into specific or generic categories.[4] Moreover, sentences categorized as specific ESG issues are segmented to classify them into environmental, social, and governance categories. This approach facilitates a more nuanced understanding of which specific ESG aspects most significantly influence investor decisions.

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[1] According to voluntary disclosure theory, funds with superior ESG outcomes will offer more ESG disclosures to differentiate themselves from average funds. Moreover, socio-political theories predict that funds that perform poorly in ESG may increase disclosures in response to social and political pressures.

[2] The Securities and Exchange Commission (SEC) proposed amendments to rules and reporting forms in May 2023 to ensure that investors receive consistent, comparable, and reliable information about how funds and advisers incorporate environmental, social, and governance factors. This included requiring additional disclosures regarding ESG strategies. According to their proposal, specific ESG disclosures provide more detailed information about the fund's ESG strategy. In contrast, generic ESG disclosures provide general information common to other funds with ESG mandates.

[3] The PIS section corresponds to item 9 of the N-1A mandatory disclosure form. In this section, funds are required to "describe the Fund's principal investment strategies, including the particular type or types of securities in which the Fund principally invests or will invest", and "explain in general terms how the Fund's adviser decides which securities to buy and sell".

[4] In our classification system, for instance, if the classification score for the "ESG issues" label is higher than 0.8, we categorize it as a specific issue (if its classification score for the "Specific ESG issues" label is higher than 0.6), or a generic issue.

To validate our classification methodology for specific and generic ESG disclosures within the PIS section, we employed dictionary-based methods, specifically the ESG word dictionary from Abraham et al. (2022), and the Loughran-McDonald Sentiment word list (Loughran & McDonald, 2011). Our analysis revealed that ESG-focused sentences generally contain a higher incidence of ESG-related words compared to non-ESG sentences, with specific ESG sentences exhibiting marginally more ESG words than generic ones. Notably, specific ESG sentences predominantly feature a higher frequency of both positive and negative sentiment words. This trend can be attributed to the detailed and focused nature of specific ESG disclosures, which often address concrete actions, achievements, or challenges, thereby invoking a more definitive and emotionally charged language (Van Duuren et al., 2016). Conversely, generic ESG sentences tend to encompass a greater number of uncertainty words, reflecting their often broader, less specific, and more exploratory nature. Subsequent to this validation, we ranked specific and generic ESG disclosures within the PIS section by word length to construct our primary explanatory variables, namely specific ESG texts and generic ESG texts, based on their percentile rank.

This study primarily investigates investors' preferences for ESG disclosures in mutual funds, focusing on the impact of specific and generic ESG disclosures on fund flows. Employing the Heckman (1979) two-step procedure, we address potential sample selection biases. Our analysis reveals that funds featuring more extensive specific ESG texts tend to attract greater investor interest, suggesting that detailed disclosures can be instrumental in garnering investor attention. For example, a 25-percentile increase in specific ESG disclosures correlates with an approximate annual fund flow increase of 28 million dollars, based on average fund size, holding all else constant. This is supported by literature suggesting that specific ESG information is perceived as more credible and useful for investment decisions (e.g. Heinle & Smith, 2017; Hope et al., 2016). Conversely, generic ESG disclosures show no significant association between mutual fund inflows which support the theory that such disclosures may complicate the evaluation process for investors without offering additional advantages (Abis et al., 2021). Furthermore, our analysis includes controls for weighted average ESG scores, representing fundamental ESG measures of the funds. These findings indicate no significant relationship between weighted ESG scores and fund flows, suggesting, as Kostovetsky and Warner (2020), that mutual funds leverage prospectus texts to convey nuanced information not immediately apparent from their holdings.

Investors might perceive that funds with specific ESG disclosures will yield superior returns, potentially explaining the increased fund flows toward such disclosures (Barber et al., 2016; Remolona et al., 1997). Our study delves into the relationship between ESG disclosures and future fund returns. We observe no significant association between

risk-adjusted returns and either specific or generic ESG disclosures. Despite the lack of evidence that specific ESG disclosures enhance fund performance, they seem to attract more investment, implying that investors might prioritize specific ESG factors over net performance. Further, our analysis explores if specific ESG disclosures amplify investor response to positive past performance. The positive coefficient found for the interaction term between ESG disclosures and past positive performance suggests that investors react more favorably to positive historical returns when funds have specific ESG disclosures. This suggests that detailed information in disclosures, such as specific ESG information, garners greater investor attention due to its precision and relevance, leading to stronger market reactions. Abis et al. (2021) also contend that when funds offer detailed strategy descriptions, investors are better equipped to discern the fund's actual benchmarks, thus gaining a clearer understanding of the fund's performance.

The impact of climate change is increasingly steering investor focus towards ESG disclosures (Ľ. Pástor et al., 2022; Tang & Zhang, 2020; Zerbib, 2019). This trend is particularly noticeable in periods of heightened climate concern, where investors may intensify their scrutiny of specific ESG disclosures to better understand and mitigate climate-related risks in fund portfolios. To explore the influence of ESG disclosures on investor attention across varying degrees of climate concern, we segmented our sample into high and low climate concern periods. Our findings reveal that during periods of high climate concern, the correlation coefficient between specific ESG disclosures and fund flows is positive and significantly more pronounced compared to periods of low climate concern. Further analysis suggests that rather than the specificity of ESG disclosures (as measured by the proportion of specific ESG texts in the PIS section), investors seem more drawn to the raw length and percentile rank of these disclosures within funds' PIS.

This paper makes several contributions. Firstly, it contributes to ESG disclosure by examining the differences between specific and generic ESG disclosures (e.g. Berg et al., 2022; Christensen et al., 2021; Sautner et al., 2022). In many studies, ESG disclosure is captured with an indicator variable signifying whether a firm makes a voluntary ESG disclosure (D. Dhaliwal et al., 2014; D. S. Dhaliwal et al., 2012; Hoi et al., 2013). Using the ESG word frequency as a measure of ESG disclosures, Andrikogiannopoulou et al. (2022) demonstrate that investors respond better to comprehensive ESG disclosures than to basic ESG disclosures. However, investors may be more interested in specific disclosures regarding how funds select investments and engage with stakeholders, rather than general ESG disclosures or boilerplate language. Thus, our study differentiates between specific and generic ESG disclosures in mutual funds. Our results indicate that specific ESG disclosures have a incremental impact on fund inflows but not generic disclosures. As a result, it provides a more nuanced view of the impact of different

types of ESG disclosures and is more insightful than simply using indicator variables or viewing all ESG disclosures equally informative.

Second, our study contributes to the textual-analysis literature by introducing a novel measure to identify specific and generic ESG disclosures. Prior work mainly uses dictionary models for classifying specific and generic statement (e.g. Filzen et al., 2023; Heinle & Smith, 2017; Hope et al., 2016; Li, 2008). The classification of specific disclosures has been dominated by studies such as Hope et al. (2016) utilizing specific entity names as a dictionary. Abis et al. (2021) also explores the variance between detailed and generic financial content in funds' prospectuses by employing Campbell Harvey's Hypertextual Finance Glossary to target relevant financial content in the fund's PIS section. However, those dictionary models may not provide a comprehensive work list for classification, such as it does not take into account all the nuances and intricacies of ESG disclosures in particular in mutual fund prospectuse texts. Additionally, they are not dynamic, so it cannot account for the changing nature of ESG disclosures over time. In our paper, we deploy Zero-Shot Classification with a large language model for classifying ESG sentences into specific or generic. With this approach, unseen classes can be predicted in scenarios with scarce labelled data typical of mutual fund texts. It also can be easily applied and provides more possibilities for future textual analysis research.

Finally, our research enriches the existing literature on mutual fund disclosures (e.g. Abis & Lines, 2020; Ceccarelli et al., 2022; Kostovetsky & Warner, 2020; Krakow, Schäfer, et al., 2020; Schwarz & Potter, 2016). As an example, Kostovetsky and Warner (2020) measure product differentiation and innovation in prospectuses using natural language processing (NLP). According to their research, investors respond more to text-based uniqueness than to other measures, such as holdings and returns. In our study, we also find that investors seem to appreciate quantitative ESG disclosures (mainly specific ESG disclosures) more than qualitative ones (holding weighted ESG scores), suggesting regulators could improve the information content of ESG disclosures by asking for more specific disclosures.

The rest of the paper is organized as follows. In Section 2, we develop hypotheses. Section 3 presents the methodology for identifying ESG disclosures through textual analysis and validation tests. The data, sample, variables and methodology are described in Section 4. Section 5 contains empirical results. The conclusion and discussion of the paper are presented in Section 6.

2 Hypothesis Development

In mutual funds, the way information is presented in prospective prospectuses may influence the behaviour of investors. The hypotheses examined in this paper focus on whether investors incorporate ESG disclosures differently between specific and generic disclosures.

2.1 Specific ESG disclosures

There are several theories about the relation between specific ESG disclosures and mutual fund flows. First, Barber et al. (2016) finds that more sophisticated investors use more complex benchmarks and are less responsive to factor-related returns, suggesting that these investors are attracted to and are capable of processing more informative and detailed information about mutual fund performance. Hope et al. (2016)'s paper emphasizes the importance of specificity in risk-factor disclosures. They argue that more specific disclosures provide users of financial statements, including investors and analysts, with better information, leading to a more accurate assessment of a firm's fundamental risks. Heinle and Smith (2017) also finds that higher risk or less precise disclosures tend to leave greater residual uncertainty, affecting investor response and pricing. In summary, these theories collectively suggest that specific and detailed disclosures attract sophisticated investors by providing comprehensive information, leading to more informed investment decisions and potentially influencing mutual fund flows.

Second, Sirri and Tufano (1998) report that there is a stronger relationship between performance and flow among funds with more marketing effort (reflected in higher fees), which in turn lowers consumers' search costs. In Abis et al. (2021), specific disclosures help investors assess a fund's performance in connection with its strategy, as they provide more transparent information and reduce uncertainties in the information environment. A detailed disclosure can help investors differentiate between the impact of active management on returns and the influence of the broader market. Investors can allocate capital more efficiently based on performance and strategy when they have better information. In this regard, the SEC (2022) believes that specific ESG disclosures will enable investors to understand and analyze whether funds and advisers are able to meet their environmental, social, and governance objectives. Providing an explanation of the relationship between ESG objectives and financial return objectives would complement existing disclosures regarding objectives related to financial returns. Investors might also be drawn to a certain kind of firm within the fund that aligns with specific ESG preferences, such as those emphasizing environmental responsibility, regardless of return distributions (Kostovetsky & Warner, 2020).

Last, a firm's commitment to a specific ESG practice may also produce financial benefits that conventional investment criteria are not able to capture (Clark et al., 2015). The findings of Derwall and Koedijk (2009) indicate that socially responsible investments (SRIs), encompassing equity and bonds, outperform their conventional counterparts by more than 1.3% annually. As well, funds with high sustainability ratings did exceptionally well during the COVID-19 crisis, particularly those with an environmental focus (L. Pástor & Vorsatz, 2020). Moreover, fund flows are conventionally correlated with the returns of the securities they hold (Warther, 1995). The impact of specific ESG disclosures on fund flows is therefore indeterminate between ESG investing and fund returns. According to the above discussion, our first hypothesis is as follows:

H1: Specific ESG disclosures in PIS are positively associated with fund flows.

2.2 Generic ESG disclosures

In contrast, generic, less precise disclosures may make evaluation harder for investors (Campbell et al., 2014; Hope et al., 2016). When information is less precise, it makes it more difficult for investors to extract, process, evaluate, and verify it. Nevertheless, the popularity of ESG concept makes more managers disclose ESG commitments. In comparison to specifics, generics are more cost-effective. Investors may prefer generic ESG disclosures if they are more drawn to the broader themes of ESG investing rather than a specific ESG mandate. Baker et al. (2022) report provides broad coverage of ESG-related concepts, particularly for investors who do not have a particular preference. They find that investors pay a premium for index funds that have extensive ESG mandates. As well as representing generic ESG commitments, these disclosures can also represent board-level commitments to ESG. As a result, investors may be attracted not only to specific disclosures, but also to generic disclosures. The above discussion leads to our second hypothesis (stated in the alternative form):

H2: Generic ESG disclosures in PIS have no relationship with mutual fund flows.

3 Measures and Validity tests

3.1 Classification of Specific and Generic ESG Disclosures

To classify specific and generic ESG disclosures, we apply two steps: first, we identify the ESG sentences, then we determine whether the sentences are specific or generic. We utilize the "Facebook/Bart-large-MNLI" model and the Zero-shot classification task in our study. This task entails passing the identification labels to the pretrained large language model and receiving the prediction scores.[5] [6] [7] In the first step, we use "ESG issue" as a label, pass it to the Bart-large-MNLI model, and get scores for each sentence in funds' PIS section. As an example, "The investment team may also consider environmental, social, and governance (ESG) factors in investment decisions." gets a score of 0.8879 for the "ESG issue" label.[8] In our study, we classify sentences scoring above 0.8 in the "ESG issue" category as ESG sentences, otherwise, as non-ESG sentences.[9] Figure 1 illustrates the proportion of funds including at least one ESG sentence in their PIS section from 2010 to 2022. The figure shows that ESG disclosures for equity mutual funds in the US increased from 2% to 5% between 2010 and 2018. Then, from 2018 to 2022, a surge in funds disclosing ESG information in their PIS section and achieve 22% in 2022.

In the second step, we determine whether those ESG sentences are specific or generic. Specific ESG sentences usually contain detailed performance information, action details, or concrete and verifiable ESG investment goals, whereas generic sentences lack these details. We use "specific ESG issue" for zero-shot classification and calculate classification score. As in this sentence, "For example, the Fund may invest in companies that focus on lowering the cost of healthcare, combatting the opioid epidemic, or offering ethically sourced products." gets a score of 0.8443 for the "specific ESG issue" label. However, the previous example "The investment team may also consider the risks and return potential presented by environmental, social, and governance (ESG) factors in investment decisions" only gets a score of 0.2837 for this label classification. A higher score for the "specific ESG issue" label indicates that the sentence is more specific. For our study, we considered ESG sentences that scored more than 0.6 to be specific ESG sentences, while those with lower scores were considered generic ESG sentences. After

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[5]The Bart-large-MNLI model is the Bart-large model after training on the MultiNLI (MNLI) dataset. According to Yin et al. (2019), pretrained NLI models can be used to make zero-shot sequence classifiers. In this method, each candidate label is used to construct a hypothesis based on the sequence to be classified as the NLI premise. As a result, entailment and contradiction probabilities are converted to label probabilities. Models downloaded from HuggingFace website: https://huggingface.co/facebook/bart-large-mnli.

[6]By setting the "multi label" parameter to "True", the zero-shot classification model will treat each class independently.

[7]Probabilities range from 0 to 1, where higher scores indicate greater probability.

[8]More sample for ESG sentence can be found in Appendix B.

[9]The alternative thresholds are tested in both steps. Appendix D shows the main results using alternative thresholds.

those two steps, we aggregate both the specific and generic ESG sentences for each fund and generate two key explanatory variables: Specific ESG text and Generic ESG text.

Figure 2 shows how many funds had specific and generic ESG text in their PIS sections between 2010 and 2022. The number of prospectuses with at least one ESG sentence increased from 150 to 1,700 from 2010 to 2022 (also a surge increase from 2018). About 90% of those prospectuses contain at least one generic ESG sentence, while around 45% contain at least one specific ESG sentence. As with ESG texts, the number of prospectuses with at least one specific and generic ESG sentence follows a similar trend. A closer look at Figure 3 shows the average word length of the specific and generic ESG text in the PIS section. From 2010 to 2022, specific ESG texts were between 80 and 100 words, except for a huge peak in 2017 (average 140 words). Between 2010 and 2022, the generic ESG text in the PIS averaged 40-60 words (a slight increase to 80 words in 2017 and 2018). It may be because the Paris Agreement entered into force at the end of 2016 that these significant values in 2017 and 2018 are the result of funds disclosing more ESG information.

We also use multiple labels to further categorize specific ESG disclosures into Environmental, social, and governance contents: Environmental, social, governance, and others. For each specific ESG sentence, we label the categories as ["environmental issues", "social issues", "governance issues", and "other issues".[10] The score of this task is normalized and summed, resulting in a probability of 1 for each sentence. As generic ESG sentences do not provide insight into specific ESG issues, the segmented ESG classification is applied primarily to specific ESG sentences.[11]

Here is an example of a specific ESG sentence: "In parallel, the portfolio managers assess potential holdings' contributions to sustainability and inclusiveness, focusing on the ability of companies to deliver positive change in areas including: (1) Social Inclusion and Education, focusing on a more inclusive society and access to and quality of education; (2) Healthcare and Quality of Life, focusing on improving healthcare that affects quality of life; (3) Environment and Resource Needs, focusing on environmental impacts that affect basic resources; and (4) Base of the Pyramid, focusing on addressing the needs of the poorest populations." In this example, the scores for environmental, social, governance, and others are 0.1361, 0.7019, 0.0113, and 0.1507. After gathering those classification scores, we multiply the length of the specific ESG sentences by their ESG score and sum them up to generate the Environmental text, Social text, and Governance text for each fund, respectively. Figure 4 shows the average word length of segmented ESG texts from 2010 to 2022. The average length of environmental texts

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[10]To achieve this, we set the "multi-label" parameter to "False".

[11]In Abraham et al. (2022), they categorize segmented ESG content using a dictionary method, but they categorize each sentence separately, not at a sentence level. Typically, the PIS section in a prospectus is short and fund managers use long sentences to highlight key ESG points.

has increased from about 25 to 28 words per PIS with a peak in 2017 at around 40 words. During this period, the social text decreased from 40 words to 20 words. From 2010 to 2022, the governance text is the smallest part and keeps around 10 words per PIS.

3.2 Validation Test

We validate our interpretation of ESG disclosures at the sentence level by comparing them to other commonly used textual measures. Among the validation measures are the length of the sentence, the ESG words, the positive words, the negative words, the uncertainty words, and the litigious words. Word counts are used to measure length. Words related to ESG are measured using Abraham et al. (2022)'s dictionary of ESG words. Using the dictionary, we count how many words relate to ESG in each sentence. Lastly, the four measures are constructed based on the frequency of positive, negative, uncertainty, and litigious words in the Loughran-McDonald Sentiment word list (Loughran & McDonald, 2011).[12]

Table 1 presents summary statistics for those textual measures at the sentence level. From our classification model, here are the results for specific ESG sentences, generic ESG sentences, and non-ESG sentences, as shown in Panels A, B, and C. The variables of interest are the length of sentences and the frequency of ESG-related, positive, negative, uncertainty, and litigious words. In Panel A, specific ESG sentences are notably concise with an average length of 39.03 words, yet they contain a higher frequency of ESG-related words (mean of 2.03), indicating targeted and focused ESG communication. In contrast, sentences in Panel B, which represent generic ESG statements, are shorter on average (32.85 words) and have a lower mean of ESG words (1.78), suggesting a less concentrated approach to ESG issues. Non-ESG sentences (Panel C) have the shortest average sentence length (32.02 words) with the least frequency of ESG words (0.04), which is expected as these sentences likely cover a range of topics unrelated to ESG matters.

Further, specific ESG sentences contain a higher proportion of positive and negative terms, indicating an examination of ESG topics that captures both their merits and challenges. However, uncertainty words are most prevalent in generic ESG sentences (mean of 0.63), which may reflect a tentative stance on ESG topics, possibly due to the lack of established standards or the evolving nature of ESG criteria. In contrast, Specific ESG sentences demonstrate a lower mean of uncertainty words (0.52), implying a more definitive discourse when addressing ESG issues directly. Litigious words are minimally

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[12]The Loughran-McDonald Sentiment word list is downloaded from Loughran-McDonald Master Dictionary w/ Sentiment Word Lists. See, https://sraf.nd.edu/loughranmcdonald-master-dictionary/.

used across all sentence types, with a slightly higher presence in Specific ESG and Non-ESG sentences, perhaps indicating occasional legal considerations in these contexts. The presence of litigious language could correlate with the regulatory and compliance aspects often associated with ESG and broader corporate communication.

4 Data and Methodology

4.1 Data, sample, and variables

This paper focuses on the PIS section of the prospectus, which provides detailed information on the financial securities the fund invests in. It also covers the policy, practice, or technique adopted by the fund adviser in determining which securities to buy and sell (see, Abis & Lines, 2020; Abis et al., 2021; Kostovetsky & Warner, 2020). Our method involves downloading the 497K filings (mutual fund summary prospectuses) from the SEC's Electronic Data Gathering, Analysis, and Retrieval system (EDGAR), and extracting text from the PIS.[13] [14] Since the SEC requires funds to update their summary prospectuses at least once a year, and all material changes in a fund's management or strategy must be reported to the SEC, we forward-fill fund-month observations that do not have prospectuses in the SEC EDGAR database by using the most recent prospectus.

We collect fundamental data about mutual funds from the Morningstar Direct Mutual Fund database. It provides information about fund expenses, fund returns, total net assets (TNA), holding weighted ESG scores, and other fund characteristics. Then we clean our sample by applying a variety of filters: (1) we analyze U.S. equity funds only, excluding international, sector, and index funds; (2) we exclude equity funds in the energy sector; (3) Funds with net assets less than $5 million and fewer than 12 months have been observed are also excluded. In order to perform fund-level measures, we aggregate data across all fund classes belonging to the same fund (using the fund's series ID).[15] The fund-level variables in this study are calculated based on the weighted average of the previous month's net assets. We also forward-fill the annual frequency variables, such as fund expense, to monthly values. In addition, we calculate monthly fund flows for fund i during month t as follows:

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[13] Instead of using 485BPOS filings, we use 497K filings since they are updated annually by each fund; while 485BPOS filings are the fund prospectuses for a whole fund family, making it difficult to extract text at the fund level for further analysis.

[14] After downloading and extracting texts from mutual fund prospectuses, we get 181,048 497K filings with PIS sections from 2010 to 2022 for all types of funds before adding filters.

[15] The prospectus and holdings of the classes in the same series ID are the same. The measures across different classes under the same fund differ in TNA, returns, and expenses.

$$Fund\ flow_{i,t} = \frac{TNA_{i,t} - TNA_{i,t-1} * (1 + r_{i,t})}{TNA_{i,t-1} * (1 + r_{i,t})} \tag{1}$$

, where $TNA_{i,t}$ are the total net assets of the fund i, and $r_{i,t}$ is the net return of the fund i during the month t. We winorize all continuous variables between 1% and 99% in order to reduce outliers. As a result, it yields 272,417 fund-month observations over the sample period.

We also construct several common textual measures, such as Text readability and Text tonality for each PIS text. In order to measure readability, the Flesch-Kincaid grade-level complexity score (Kincaid et al., 1975) is used, which calculates the number of years of schooling required for understanding a given text.[16] In textual tonality, there are four measures, Positive, Negative, Uncertainty, and Litigious words frequency. As defined in the Loughran-McDonald Sentiment word list, positive, negative, uncertain, and litigious words are divided by the length of the PIS section to calculate the frequency.

4.2 Methodology

4.2.1 Heckman first-stage

In this study, ESG disclosure funds are used to examine the effects of specific and generic ESG disclosures on investors' attention. It is possible, however, to omit variables in regression estimation when using a non-randomly selected sample, which can affect coefficient estimations. To address this, the main tests are corrected using Heckman (1979) two-step procedure. First, I estimate a selection model using all the sample firms and calculate the inverse Mills ratio (IMR). Secondly, I correct for selection bias by including IMR as a control variable in the main tests on ESG disclosure samples. The following probit model is used in the Heckman first step to explain ESG disclosure funds.

$$
\begin{aligned}
Prob(ESG\ disclosures_{i,t} = 1) = Probit(\gamma_0 + \gamma_1 * Sustainable\ fund_{i,t} \\
+ \gamma_2 * Prob\ of\ Disclosures_{i,t} \\
+ \gamma_3 * fund\ controls_{i,t} + \epsilon_{i,t})
\end{aligned} \tag{2}
$$

, $ESG\ disclosures_{i,t}$ dummy equals 1 if fund i provides ESG disclosures in month

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[16]A high score indicates it is difficult to read.

t, otherwise equals zero. As described by Lennox et al. (2012), a convincing implementation of the first stage choice model is needed to identify exogenous independent variables that should be excluded in the second stage regression. As a result, the first stage regression includes two controls in addition to the fundamental fund variables: sustainable fund and proportion of disclosure. A dummy variable, *sustainable fund*$_{i,t}$, is equal to 1 if the fund is classified as sustainable in Morningstar's database. The proportion of funds that provide ESG disclosure, *Prob of Disclosures*$_{i,t}$, is calculated as a ratio of the number of funds in this category that provide ESG disclosure in a given month, following Berkman et al. (2021). Details of other variables can be found in Appendix A. This model also includes fund category and month fixed effects.

4.2.2 Heckman second-stage (main regression)

Based on the ESG disclosure sample, we estimate the following equation to examine how investors respond to specific and generic ESG disclosures:

$$
\begin{aligned}
Fund\ flows_{i,t} = \beta_0 &+ \beta_1 * Specific\ ESG\ text_{i,t} \\
&+ \beta_2 * Generic\ ESG\ text_{i,t} \\
&+ \beta_3 * fund\ controls_{i,t} \\
&+ \beta_4 * other\ textual\ variables_{i,t} + \beta_5 * IMR_{i,t} + \epsilon_{i,t} \quad (3)
\end{aligned}
$$

, *Fund flows*$_{i,t}$ is the net flow for fund i in month t as calculated from equation 1. In this regression, the ESG measures, *specific ESG text* and *generic ESG text*, are ranked according to their percentile rank by month. In order to make investment decisions, investors are more likely to make use of the information contained in prospectuses, especially when comparing funds with their peers. Also, weighted average ESG scores (one variable of *fund controls*) are calculated using percentile ranks.[17] Furthermore, we control fundamental fund variables, other textual measures, as well as the Inverse Mills ratio (*IMR*) resulting from the Heckman correction in the first stage. We also use fixed effects based on fund category and month, and double-cluster the Standard errors by fund and month.

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[17]This choice is based on the fact that Morningstar provides the ESG score data we are using, which has changed its measurement approach since October 2019. Before October 2019, higher ESG scores mean better ESG performance; after that, higher ESG scores mean higher ESG risks.

5 Empirical Results

5.1 ESG Disclosures and Fund Flows

5.1.1 Heckman First-Stage Results—Correcting for the Potential Sample Selection Bias

The Heckman procedure is initiated by estimating the probit model (Equation 2) explaining the ESG disclosure funds, followed by obtaining the inverse Mills ratio (IMR) as a control variable, taking into account the potential omitted variable problem caused by the non-random sample when estimating Equation 2. Table 2 reports summary statistics of the independent variables and displays comparisons between ESG disclosure funds and other funds in the probit regression analysis. The difference in means between those two groups is reported in panel C. Compared to non-ESG disclosure funds, ESG disclosure funds are more likely to be a sustainable fund in Morningstar's database and to be allocated to Morningstar categories with a higher level of ESG disclosure. As well as having significantly higher holding weighted ESG scores, higher net returns, and longer PIS lengths, ESG disclosure funds also have a significantly higher rank of holding weighted ESG scores. Further, ESG disclosure funds have smaller sizes, younger ages, lower turnover ratios, and lower expenses than other funds.[18]

Table 3 presents the results of the first-stage probit regression of ESG disclosure choice. The coefficients for sustainable funds and prop_disclosure are both significant at the 0.01 level. This model has high explanatory power (Pseudo $\hat{R2}$ of 0.29). The results are in line with previous research that predicts that funds under regulation or peer pressure will disclose more ESG information, according to Berkman et al (2020). Also, funds with a stable investment strategy (low turnover ratio) are more likely to disclose their ESG strategies.

5.1.2 Heckman Second-Stage Results – ESG disclosures and Fund Flows

Table 4 shows the descriptive statistics of the textual variables in the main tests of the effect of specific and generic ESG disclosures on mutual fund flows. The average number of words in specific ESG text and generic ESG text in funds' PIS is 38.8 and 46.2.[19] Text about the environment, social issues, and governance averages 10.3, 10.3, and 5.2 words, respectively.[20] PIS sections have an average text readability score of

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[18]Although we expect that funds with ESG disclosures will have higher ESG expenses, the result is counterintuitive. The following probit regression shows no association between fund expense and ESG disclosure dummy.

[19]Due to the fact that we average the total funds ESG disclosures, the average number of specific ESGs is less than the average number of generics. On the other hand, in Figure 3, we calculate the average only for funds with specific ESG text.

[20]The aggregate of average segmented ESG is lower than average specific ESG because some text is related to other issues.

16.4, representing a level for skilled readers. There are 1.3% positive words in PIS, 0.6% negative words, 2.3% uncertain words, and 0.2% litigation words. Those text tone scores suggest more positive words than negative words.

In Table 5, we report the Pearson correlations between the variables in the main tests for ESG disclosure funds. There is a positive and significant correlation between the percentile rank of specific and generic ESG disclosures (Pearson correlation of 0.56). Holding weighted ESG scores also correlate significantly with both generic and specific ESG disclosures (both with Pearson correlations of 0.01). Based on the low correlation, it is also likely that the textual ESG measure captures other ESG-related information than the holding ESG measure. It is interesting to note that specific ESG disclosures appear to be positively associated with fund expenses, whereas generic ESG disclosures appear to be negatively associated. It indicates that specific ESG disclosures may require more research costs, whereas generic ESG disclosures require less. In addition, the uncertainty word frequency is contracted between generic and specific ESG disclosures. According to our findings, there is a negative correlation between uncertain word frequency and specific ESG disclosures, but a positive association between generic ESG disclosures.

In Table 6, we present the outcomes of applying Equation 3 to assess the impact of specific and generic ESG disclosures on fund flows. Columns 1 and 2 independently factor in the percentile ranks of specific and generic ESG texts, while Column 3 considers both concurrently. We observe statistically significant influences of specific ESG texts on fund flows at the 5% level across all models. For example, a 0.0057 coefficient on specific ESG topic mentions in Column 3 suggests that an uptick in such mentions is associated with an additional monthly inflow of 0.0057% of the fund's net asset values, amounting to 0.068% annually. To highlight economic impact, a 25-rank rise in specific ESG text could translate to an annual fund inflow increase of 26 million US dollars. Our results consistently show a positive link between specific ESG measures and fund inflows, remaining stable even when accounting for holding weighted ESG scores, past performance, other fund attributes, and various textual metrics for PIS. These findings underscore that specific ESG texts significantly attract investor interest, thereby validating our first hypothesis that specific ESG disclosures contribute to enhanced fund flows.

However, we find no significant association between generic ESG text and fund inflows across all specifications, supporting our second hypothesis. The relationship between holding weighted ESG scores and fund flows is also not significant. In those results, investors tend to pay more attention to ESG texts that specify specific issues than to generic ESG texts or to fundamental ESG scores. In columns 4-6 of Table 6, we

replace the percentile rank of specific ESG text with segmented ESG text. Segmented ESG text results are similar as those of specific ESG texts with a slightly higher coefficient of environmental text of 0.0057, 0.0064 for social text, and 0.0054 for governance text (significant levels at 5%, 5%, and 10% respectively).

Along with the ESG measures, we find that fund flows are significantly and positively related with past performance and fund size at 1% level, while negatively related with fund age. The results are consistent with previous literature (e.g. Sirri & Tufano, 1998). The fund flows of funds are not associated with other textual measures of the funds' PIS in our test. The Inverse Mills Ratio (IMR) is also included in our second stage model when examining the effect of ESG disclosures on funds. It appears that our estimation is influenced by self-selection, since the IMR is negative and significant. The negative coefficient on the IMR suggests that the unobserved factors contributing to the inclusion of ESG disclosures are negatively related to fund flows.

5.2 ESG Disclosures and Fund returns

Fund investors may be drawn to funds with ESG disclosures, believing they will outperform. However, some investors might still favor specific ESG strategies or styles for reasons beyond performance expectations, even if these funds show negative expected risk-adjusted returns. To determine whether the increased fund flows caused by specific ESG disclosures are driven by this theory, we further test the relationship between ESG disclosures and fund future returns. In Table 7, the dependent variable is Carhart's 4-factor alpha, which measures fund risk-adjusted returns.[21] We find that both specific and generic ESG disclosures have no significant impact on fund returns. As for holding weighted ESG scores, the correlation is not significant either. Moreover, fund alphas are positively related to past performance, fund size, and positive tonality; and negatively related to fund age, PIS length, and fund expense. In this study, the results suggest that fund disclosures with more specific ESG factors do not produce high risk-adjusted alpha. In other words, specific ESG disclosures attract fund inflows even when funds do not outperform each other.

Additionally, we analyze the effect of ESG disclosures on flow-performance relationships. Past research has found a strong link between risk-adjusted return and fund flows (e.g. Jank, 2012; Remolona et al., 1997). This effect can be enhanced by ESG disclosures if they facilitate benchmarking and increase investors' ability to move money to

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[21]we calculate monthly fund alphas based on the 4-factor model of Carhart (1997) using monthly fund and factor returns. We use the CRSP NYSE/Amex/NASDAQ value-weighted index as the market factor, the one-month Treasury bill rate as the risk-free rate, and the factor-mimicking portfolios for size, book-to-market, and momentum, all downloaded from Kenneth French's website. Rolling betas are estimated using data from the previous 60 months and require a minimum of 24 monthly observations.

funds that follow the same strategy. Table 8 presents the results of regressing monthly fund flows on past performance and past performance's interaction with ESG disclosure measures. This table includes fund control variables and category and month-fixed effects.

Our regression in Panel A of Table 8 examines the impact of ESG disclosure measures, past performance, and interaction terms on fund flows. In Column 1, we measure ESG disclosure by the percentile rank of specific ESG texts. Based on the interaction term, we find a positive coefficient at 5% significance level, indicating that specific ESG texts increase flow sensitivity to past returns. Furthermore, the positive coefficient on past performance is highly statistically significant (t-statistics >5) in accordance with previous research. The magnitude of the coefficient on the interaction term is 0.3% of the magnitude of the coefficient on past performance, so a 25-rank increase in specific ESG text increases the flow-performance relationship by 7.6%. Using generic ESG text as ESG disclosure measures in Column 2, we find that generic ESG text has no effect on flow-performance sensitivity.

On Panel B of Table 8, we further decompose past performance into its positive component, past performance (+), and its negative component, past performance (-), and also consider ESG disclosures in relation to the two components. The goal of this decomposition is to determine whether the enhancement of the flow-performance relationship is symmetrical or whether there is a stronger impact on inflow (after good performance) or outflow (after bad performance). We find only the interaction between specific ESG text and positive past return is positive and significant at 5% level, which indicates that funds attract more inflows after performing well, but not more outflows after performing poorly if they disclose specific ESG disclosures.

5.3   Climate concerns

Investment landscapes have become more concerned about climate concerns. In a United Nations (UN) climate survey released in 2021, almost two-thirds of respondents cited climate change as a global emergency, calling for greater action. The fact that an increasing number of investors prioritize sustainable and responsible investments might make funds with high ESG disclosures more attractive, especially if those disclosures address climate change substantively. Thus, investors may react more positively to such funds, potentially intensifying the positive correlation between ESG disclosures and fund flows. Accordingly, this analysis examines whether the relationship between ESG disclosures, especially environmental disclosures and fund flows varies during different climate concern periods. We separate our sample based on the climate concern

index, high climate concerns period and low climate concerns period.[22] Then, the specifications are estimated.

Table 9 Panel A shows that mutual fund flows are positively and significantly related to specific ESG text (at a 1% significant level) and environmental text (at a 5% significant level) during high climate concerns. In the period of high climate concern, the coefficient of the specific ESG test is higher than the coefficient of the all-period test, indicating that the effect of specific ESG text on fund flows is more pronounced than in other periods. Like the main findings in Table 6, there is no association between fund flows and generic ESG texts. In Panel B, we find that all ESG disclosure measures have no significant association with mutual fund flows during low climate concern periods. Overall, these results support the idea that specific ESG texts can address climate concerns, attract investors during times of high concern, and lead to increased fund inflows. The results of this test provide valuable insights into how climate concerns affect funds' investor behaviour and preferences regarding ESG disclosures.

5.4   Robustness test

For our study, we conduct two series of robustness tests. The first is using alternative measures of ESG disclosures, such as the natural log of raw word length and proportion. In Table 10, we repeat our analysis using an alternative ESG disclosure measure method, and we find that using the log of raw length (in Columns 1-3) gives the same results as using the percentile rank. The proportion of ESG disclosures, however, does not appear to have any significant coefficients on any ESG disclosure measure. This implies that investors prefer raw length or percentile rank over PIS proportion for ESG disclosures. Additionally, we test the robustness of the alternative threshold. According to section 3, the thresholds for identifying ESG sentences and specific ESG sentences are discretionary (0.8 and 0.6, respectively). Thus, we reclassify our texts using alternative thresholds for identification and then repeat our analysis for robustness testing. We find that all results are robust, as shown in Appendix D.2 (higher threshold) and Appendix D.3 (lower threshold).[23]

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[22]High climate periods are periods in which the average climate concern index between 2010 and 2022 is approximately 1.47, or greater or equal to that index. The term low climate period refers to periods during which the climate concern index is below this average.

[23]Appendix D.1 shows the summary of the number of sentences with different classification thresholds

6   Conclusion

In this study, we introduce a novel method to identify specific or generic ESG disclosures and examine which ESG disclosures influence investor decisions more. We focus on the PIS section of the prospectus of US equity mutual funds and use the zero-shot classification task to identify both generic and specific ESG disclosures. We find that funds with more specific disclosures about ESG commitments attract more investors, indicating that more disclosures can attract more investors. Neither generic ESG disclosures nor holding weighted ESG scores appear to be associated with mutual fund flows.

Specific ESG disclosures may be perceived as outperforming fund returns, which could explain why specific ESG disclosures attract more flows. Despite this, specific ESG disclosures do not appear to improve fund performance. Moreover, ESG disclosures increase the flow sensitivity to positive past performance. Moreover, we find that the positive relationship between specific ESG disclosures and fund inflows is more prominent during times of high climate concern, suggesting that climate change is increasing investor attention to specific ESG disclosures. Despite this, investors are not concerned about the specificity of ESG disclosures as measured by the proportion, but rather about the percentile rank or raw length of them.

It makes several contributions to the literature on ESG disclosures by comparing specific and generic disclosures. First, it provides a more nuanced picture of the impact of different types of environmental, social, and governance disclosures rather than simply using indicators or viewing them all equally. Secondly, our study contributes to the textual-analysis literature by proposing a new measure to identify both generic and specific ESG disclosures in mutual fund prospectuses. Moreover, it enriches the literature on mutual fund disclosures by measuring product differentiation and innovation using natural language processing (NLP), and finding that investors respond better to text-based uniqueness than other measures, such as holding ESG measures or other textual measures based on dictionary methods.

As the end of 2022, the SEC has proposed amendments to rules and reporting forms intended to provide consistent, comparable, and reliable information to investors about how funds and advisers consider environmental, social, and governance issues. This included requiring additional disclosures regarding ESG strategies. According to their proposal, specific ESG disclosures provide more detailed information about the fund's ESG strategy. In contrast, generic ESG disclosures provide general information common to other funds with ESG mandates. As a result of our research, we are able to provide empirical support for this proposal and open to the possibility of continuing our work

in different fields in relation to assessing disclosure quality.

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Figures

Figure 1: Proportion of Funds with ESG Text in PIS

Figure 1 illustrates the proportion of funds that include ESG-related text in their PIS section, as a percentage of the total funds, for each year from 2010 to 2022.
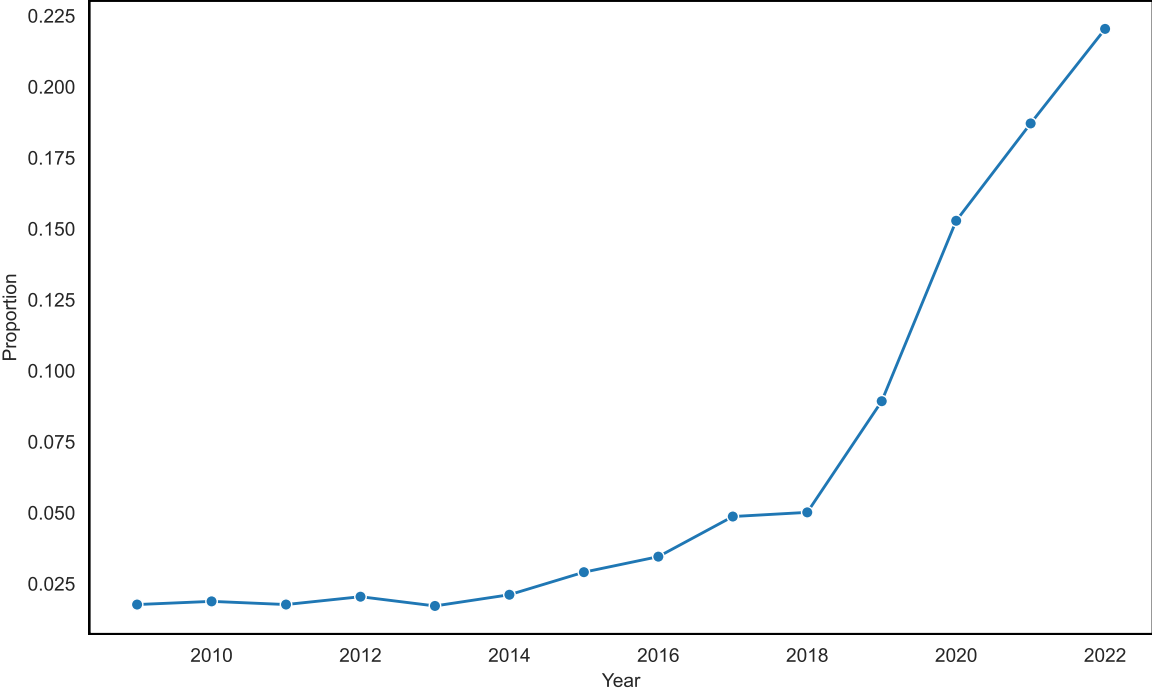
Figure 2: Number of Funds with ESG Text in PIS

Figure 2 displays the number of funds with ESG-related text in their PIS section by year from 2010 to 2022. The blue line (with circles) represents funds with any ESG text, be it specific or generic sentences; the orange line (with squares) indicates those with at least one specific ESG-related sentence; and the green line (with triangles) denotes funds containing at least one generic ESG-related sentence.
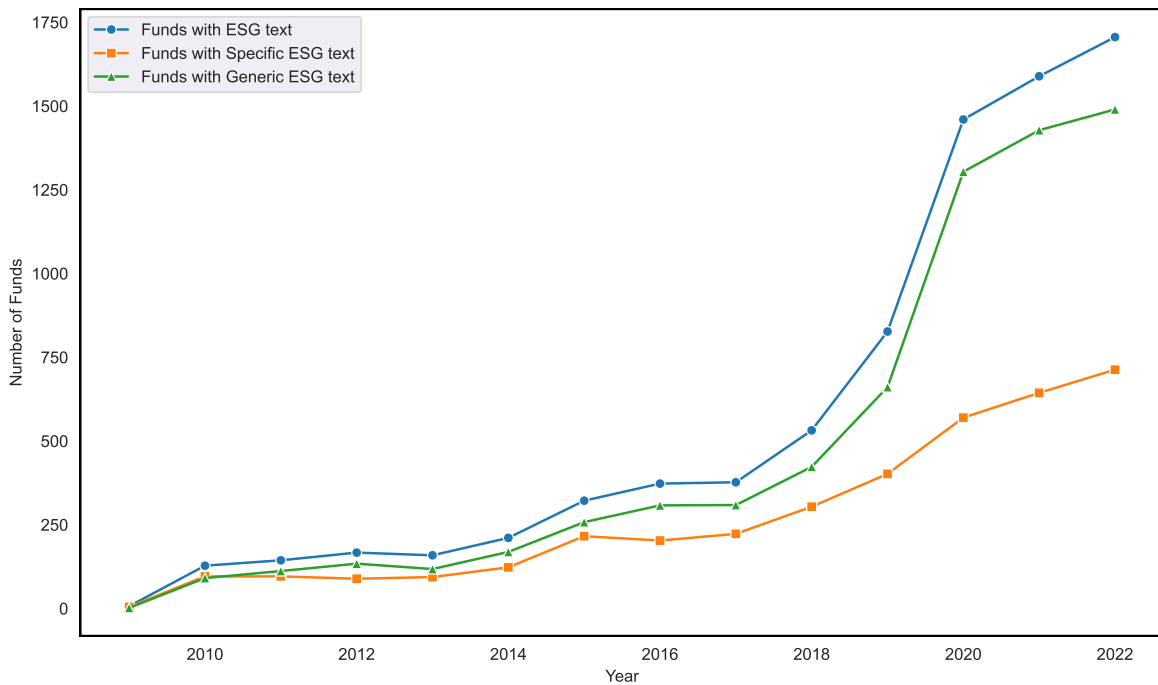
Figure 3: Average Length of Specific and Generic ESG Text in PIS

Figure 3 displays the average length of specific and generic ESG text in funds' PIS sections from 2010 to 2022. The blue line (with circles) indicates the average length of specific ESG text among funds with at least one specific ESG-related sentence, and the orange line (with squares) represents the average length of generic ESG text among funds with at least one generic ESG-related sentence.
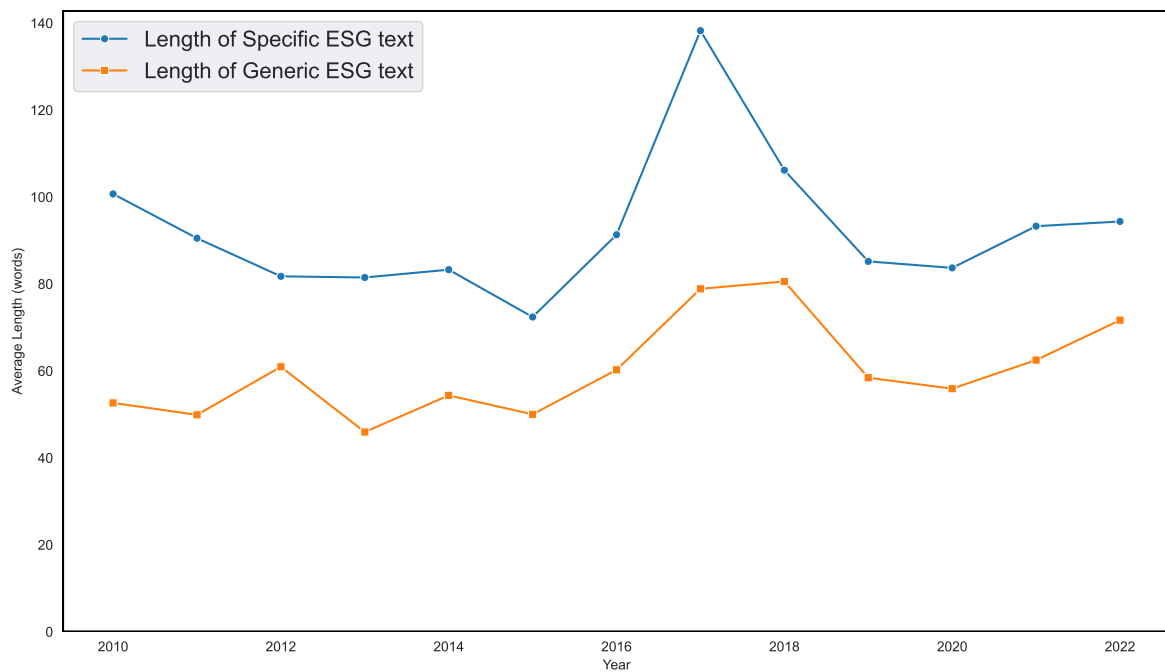
Figure 4: Average Length of ESG Components within Specific Text in PIS

Figure 4 illustrates the average length of each ESG component in the specific text of funds' PIS sections from 2010 to 2022. For each year, represented by stacked bars, the blue pattern with right slashes indicates the environmental text's average length, the orange pattern with left slashes indicates the social text's, and the green pattern with vertical slashes indicates the governance text's.
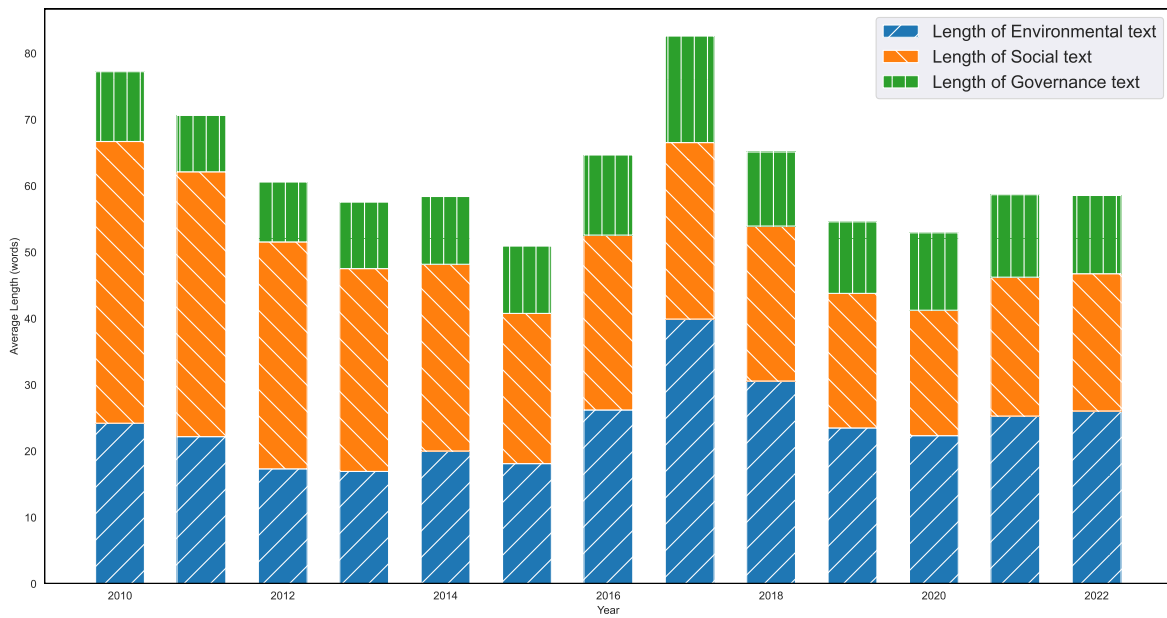
Tables

Table 1: Validation test - Summary Statistics for Sentence-level Measures

Table 1 presents the summary statistics for PIS sentences as the validation test. For each sentence, we count the number of words to determine its length. We then utilize the dictionary of ESG words from Jefferson, Marcel, and Florin (2023) to count the occurrences of ESG-related words within the sentence. Additionally, we tally the frequency of positive, negative, uncertainty, and litigious words as defined in the Loughran-McDonald Sentiment word list. In Panel A, we report the sentence-level summary statistics for specific ESG sentences. In Panel B, we present the statistics for generic ESG sentences. In Panel C, we report the statistics for non-ESG sentences.

Panel A: Specific ESG sentences

	count	mean	sd	p10	p25	p75	p90
Length(words)	4,182	39.03	18.93	17	24	54	71
ESG words	4,182	2.03	2.08	0	1	3	4
Positive words	4,182	0.53	0.94	0	0	1	2
Negative words	4,182	0.45	1.31	0	0	0	1
Uncertainty words	4,182	0.52	0.88	0	0	1	2
Litigious words	4,182	0.08	0.34	0	0	0	0

Panel B: Generic ESG sentences

	count	mean	sd	p10	p25	p75	p90
Length(words)	4,762	32.85	14.81	16	21	41	54
ESG words	4,762	1.78	1.40	0	1	2	3
Positive words	4,762	0.43	0.83	0	0	1	1
Negative words	4,762	0.15	0.47	0	0	0	1
Uncertainty words	4,762	0.63	0.89	0	0	1	2
Litigious words	4,762	0.02	0.19	0	0	0	0

Panel C: Non-ESG sentences

	count	mean	sd	p10	p25	p75	p90
Length(words)	450,756	32.02	16.09	14	20	41	57
ESG words	450,756	0.04	0.30	0	0	0	0
Positive words	450,756	0.26	0.65	0	0	0	1
Negative words	450,756	0.19	0.56	0	0	0	1
Uncertainty words	450,756	0.70	0.96	0	0	1	2
Litigious words	450,756	0.09	0.39	0	0	0	0

Table 2: Summary Statistics for Mutual Fund Characteristics

Table 2 presents the summary statistics for mutual fund characteristics of US equity funds from 2010 to 2022. *Fund flows (%)* represent the net inflows or outflows of a fund during a month. *Sustainable fund* is an indicator variable that equals 1 if the fund is considered a sustainable investment fund in the Morningstar database. *Prop_disclosure* is the ratio of the number of funds in a Morningstar category that disclose ESG text to the total number of funds in this category in a month. *Holding weighted ESG score (rank)* is the relative percentile ranking of the numeric value representing the average environmental, social, and governance (ESG) scores of a portfolio's holdings. *Past 12-month net return (%)* represents the fund returns generated over the preceding 12-month period, net of fund expenses. *Fund size* is the natural logarithm of the fund's total net assets (measured in US million). *Fund age* is calculated by subtracting the fund's inception year from the current year. *Log(PIS length)* is the natural logarithm of the total word length of a mutual fund's PIS section. *Turnover ratio (%)* is the value of all transactions (buying, selling) divided by two and then by the fund's total holdings. *Log(Fund expense)* is the natural logarithm of operating expenses and management fees. In Panel A, we show the summary statistics of those fund variables for funds with ESG text in their PIS section. In Panel B, we show the summary statistics for funds without ESG text in their PIS section. Panel C demonstrates the significance of the difference in means between the group with ESG text and the group without ESG text, based on t-statistics from t-tests.

Panel A: With ESG text group

	count	mean	sd	p10	p25	p75	p90
Fund flow(%)	19,302	0.22	6.16	-2.88	-1.19	1.18	4.27
Sustainable fund	19,302	0.15	0.36	0.00	0.00	0.00	1.00
Prop_disclosure	19,302	0.17	0.14	0.03	0.07	0.20	0.33
Holding weighted ESG score(rank)	19,302	51.73	29.21	11.00	26.00	77.00	92.00
Past 12-month net returns(%)	19,302	0.88	1.55	-0.91	-0.03	1.77	2.80
Total net asset value	19,302	1525.90	4033.50	17.20	68.30	1189.50	3482.40
Fund age	19,302	17.18	14.27	3.00	6.00	24.00	32.00
Total word count in PIS	19,302	488.77	229.69	257.00	327.00	608.00	781.00
Turnover ratio(%)	19,302	56.70	52.37	14.00	25.00	71.00	114.00
Expense ratio (%)	19,302	1.00	0.37	0.50	0.81	1.20	1.44

Panel B: Without ESG text group

	count	mean	sd	p10	p25	p75	p90
Fund flow(%)	253,115	-0.33	6.53	-3.40	-1.49	0.72	3.24
Sustainable fund	253,115	0.01	0.08	0.00	0.00	0.00	0.00
Prop_disclosure	253,115	0.06	0.07	0.00	0.02	0.08	0.17
Holding weighted ESG score(rank)	253,115	49.47	28.80	10.00	25.00	74.00	89.00
Past 12-month net returns(%)	253,115	0.74	1.16	-0.57	0.02	1.41	2.13
Total net asset value	253,115	2160.71	5375.70	24.00	87.30	1547.30	5008.90
Fund age	253,115	17.40	13.58	4.00	8.00	23.00	31.00
Total word count in PIS	253,115	353.53	222.88	108.00	199.00	449.00	624.00
Turnover ratio(%)	253,115	72.23	99.48	14.00	27.00	83.00	139.00
Expense ratio (%)	253,115	1.05	0.39	0.59	0.83	1.27	1.51

Panel C: Difference in the means

	Difference (ESG group - Non-ESG group)
Fund flow(%)	0.554***
Sustainable fund	0.144***
Prop_disclosure	0.106***
Holding weighted ESG score(rank)	2.263***
Past 12-month net returns(%)	0.133***
Total net asset value	-634.802***
Fund age	-0.218*
Total word count in PIS	135.236***
Turnover ratio(%)	-15.537***
Expense ratio (%)	-0.053***
Observations	272,417

Table 3: Heckman First-Stage Results

Table 3 displays the estimated results of the first stage of the Heckman procedure, using a Probit model to correct for potential sample bias. The sample period spans from 2010 to 2022. The dependent variable, *ESG disclosure dummy*, is an indicator variable that takes a value of 1 if a fund-month observation discloses ESG-related texts in the fund's PIS section. Definitions for all explanatory variables can be found in Table 2. Each specification includes fund category and month fixed effects. t-statistics are given in parentheses, with standard errors clustered by fund and month. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1) ESG disclosure dummy
Sustainable fund	2.2488***
	(12.80)
Prop_disclosure	4.6933***
	(10.78)
Holding weighted ESG score(rank)	0.0012
	(1.49)
Past 12-month net returns(%)	0.0509***
	(3.76)
Fund size	-0.0321*
	(-1.96)
Fund age	0.0018
	(0.71)
Log(PIS length)	0.6048***
	(10.97)
Turnover ratio(%)	-0.0015***
	(-3.71)
Log(Fund expense)	0.0284
	(0.74)
Category Fixed Effects	YES
Month Fixed Effects	YES
Observations	266,621
Pseudo R^2	.2913

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4: Summary Statistics of Textual Variables

Table 4 presents the summary statistics of textual variables for funds with ESG text in their PIS from 2010 to 2022. *Specific ESG text (words)* refers to the word length of specific ESG text in a fund's PIS section. *Generic ESG text (words)* denotes the word length of generic ESG text in a fund's PIS section. *Environmental text (words)*, *Social text (words)*, and *Governance text (words)* represent the average length of each ESG component in the specific text of funds' PIS sections, respectively. *Text readability* is calculated using the Flesch Reading Ease (Flesch, 1948) to determine how difficult the text is to read. *Text tonality* is measured by the frequency (expressed as a percent) of positive, negative, uncertain, and litigious words, as defined in the Loughran-McDonald sentiment word list.

	count	mean	sd	p10	p25	p75	p90
Specific ESG text(words)	17,723	38.81	67.40	0.00	0.00	56.00	110.00
Generic ESG text(words)	17,723	46.20	48.66	0.00	16.00	64.00	107.00
Environmental text(words)	17,723	10.41	23.89	0.00	0.00	11.25	28.71
Social text(words)	17,723	10.41	20.44	0.00	0.00	12.18	35.12
Governance text(words)	17,723	5.13	10.49	0.00	0.00	6.22	13.49
Text readability (Flesch-Kincaid grade)	17,723	16.39	2.00	14.20	15.00	17.50	18.90
Text tonality (Positive word freq, as %)	17,723	1.27	0.80	0.35	0.69	1.70	2.36
Text tonality (Negative word freq, as %)	17,723	0.61	0.62	0.00	0.26	0.81	1.28
Text tonality (Uncertain word freq, as %)	17,723	2.31	1.12	1.10	1.62	2.87	3.46
Text tonality (Litigious word freq, as %)	17,723	0.20	0.24	0.00	0.00	0.34	0.53

Table 5 presents the Pearson pairwise correlation coefficients between textual variables and other fund characteristics for funds that include ESG text in their PIS from 2010 to 2022. For all ESG-related variables, we use the relative percentile ranking compared to other mutual funds in the same month and display these as ranks. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 5: Pearson Correlation Matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(1) Fund flow	1.00																	
(2) Specific ESG text(rank)	0.02***	1.00																
(3) Generic ESG text(rank)	0.02***	0.56***	1.00															
(4) Environmental text(rank)	0.02***	0.98***	0.55***	1.00														
(5) Social text(rank)	0.02***	0.98***	0.55***	0.98***	1.00													
(6) Governance text(rank)	0.02***	0.98***	0.55***	0.98***	0.99***	1.00												
(7) Holding weighted ESG score(rank)	-0.01**	0.01***	0.01***	0.01***	0.01***	0.01***	1.00											
(8) Past 12-month net returns	0.09***	0.02***	0.03***	0.02***	0.02***	0.02***	0.00	1.00										
(9) Fund size	0.03***	-0.06***	-0.04***	-0.06***	-0.05***	-0.05***	0.03***	0.09***	1.00									
(10) Fund age	-0.05***	-0.04***	-0.02**	-0.04***	-0.04***	-0.04***	0.03***	0.07***	0.40***	1.00								
(11) Log(PIS length)	-0.00	0.15***	0.14***	0.14***	0.14***	0.14***	0.01***	-0.09***	-0.17***	-0.16***	1.00							
(12) Turnover ratio	-0.02***	-0.03***	-0.04***	-0.04***	-0.03***	-0.04***	-0.03***	-0.05***	-0.20***	-0.09***	0.11***	1.00						
(13) Log(Fund expense)	0.01***	0.01**	-0.02***	0.00*	0.00	0.00	-0.01***	0.01***	-0.29***	-0.02***	0.05***	0.19***	1.00					
(14) Text readability (Flesch-Kincaid grade)	0.00	0.11***	0.10***	0.10***	0.10***	0.10***	-0.00*	-0.04***	-0.09***	-0.08***	0.27***	0.04***	0.05***	1.00				
(15) Text tonality (Positive word freq, as %)	0.00	0.04***	0.05***	0.04***	0.04***	0.03***	0.02***	0.06***	0.03***	0.07***	0.14***	-0.05***	-0.01***	0.10***	1.00			
(16) Text tonality (Negative word freq, as %)	-0.01***	0.05***	0.04***	0.05***	0.05***	0.04***	0.02***	-0.03***	-0.10***	-0.07***	0.37***	0.12***	0.04***	0.12***	0.12***	1.00		
(17) Text tonality (Uncertain word freq, as %)	-0.01***	-0.03***	0.03***	-0.03***	-0.03***	-0.03***	0.01***	-0.05***	-0.05***	-0.02***	0.42***	0.10***	0.00	0.00	0.17***	0.38***	1.00	
(18) Text tonality (Litigious word freq, as %)	-0.01**	0.02***	0.01**	0.02***	0.02***	0.02***	0.03***	-0.05***	0.01***	0.00	0.29***	0.10***	0.01***	0.09***	-0.01***	0.20***	0.23***	1.00

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 6: Heckman Second-Stage Results: ESG Disclosures and Fund Flows

Table 6 presents results of the Heckman two-stage selection model, analyzing the impact of ESG disclosure variables on monthly fund flows. The dependent variable, *Fund flows*, represents the ratio of monthly asset flows to start-of-month assets. Rather than utilizing the raw word length, we employ the percentile rank of ESG disclosure variables among funds in a month. In Column 1, the ESG disclosure variable is *Specific ESG text (rank)*; in Column 2, it is *Generic ESG text (rank)*. Column 3 includes both *Specific ESG text (rank)* and *Generic ESG text (rank)*. Columns 4, 5, and 6 incorporate *Environmental text (rank)*, *Social text (rank)*, and *Governance text (rank)*, respectively, each in combination with *Generic ESG text (rank)*. We also control for the fund's characteristics and other textual variables, as well as the *IMR* (Inverse Mills Ratio) generated from the first-stage Heckman procedure. Definitions for all explanatory variables can be found in Table 2 and Table 4. Each specification includes fund category and month fixed effects. t-statistics are given in parentheses, with standard errors clustered by fund and month. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Fund flows					
	(1)	(2)	(3)	(4)	(5)	(6)
Specific ESG text(rank)	0.0055**		0.0057**			
	(2.04)		(2.11)			
Environmental text(rank)				0.0057**		
				(2.17)		
Social text(rank)					0.0064**	
					(2.45)	
Governance text(rank)						0.0054**
						(2.09)
Generic ESG text(rank)		0.0024	0.0030	0.0030	0.0031	0.0030
		(0.74)	(0.91)	(0.91)	(0.94)	(0.91)
Holding weighted ESG score(rank)	-0.0026	-0.0026	-0.0024	-0.0024	-0.0022	-0.0023
	(-0.97)	(-0.97)	(-0.88)	(-0.89)	(-0.83)	(-0.86)
Past 12-month net returns	1.0523***	1.0612***	1.0540***	1.0544***	1.0512***	1.0551***
	(7.30)	(7.40)	(7.34)	(7.34)	(7.33)	(7.34)
Fund size	0.1339*	0.1240*	0.1339*	0.1324*	0.1319*	0.1311*
	(1.95)	(1.85)	(1.95)	(1.95)	(1.94)	(1.92)
Fund age	-0.0516***	-0.0516***	-0.0509***	-0.0507***	-0.0507***	-0.0508***
	(-6.03)	(-5.88)	(-5.85)	(-5.85)	(-5.83)	(-5.84)
Log(PIS length)	-0.0975	-0.0590	-0.1330	-0.1291	-0.1398	-0.1238
	(-0.37)	(-0.22)	(-0.51)	(-0.49)	(-0.53)	(-0.47)
Turnover ratio	-0.0022	-0.0022	-0.0021	-0.0020	-0.0021	-0.0021
	(-1.24)	(-1.24)	(-1.18)	(-1.14)	(-1.17)	(-1.17)
Log(Fund expense)	0.3468	0.3500	0.3492	0.3485	0.3476	0.3504
	(0.93)	(0.94)	(0.94)	(0.94)	(0.93)	(0.94)
Text readability (Flesch-Kincaid grade)	0.0006	0.0094	-0.0018	0.0002	-0.0010	0.0020
	(0.01)	(0.18)	(-0.04)	(0.00)	(-0.02)	(0.04)
Text tonality (Positive word freq, as %)	0.1041	0.1080	0.0985	0.0963	0.1002	0.1026
	(0.83)	(0.86)	(0.78)	(0.76)	(0.80)	(0.82)
Text tonality (Negative word freq, as %)	-0.1634	-0.1292	-0.1643	-0.1666	-0.1692	-0.1542
	(-0.97)	(-0.77)	(-0.98)	(-0.99)	(-1.01)	(-0.92)
Text tonality (Uncertain word freq, as %)	0.2012*	0.1443	0.2008*	0.2018*	0.2080*	0.1949*
	(1.75)	(1.31)	(1.74)	(1.74)	(1.82)	(1.71)
Text tonality (Litigious word freq, as %)	0.0623	0.2128	0.0916	0.0919	0.0785	0.1033
	(0.12)	(0.42)	(0.18)	(0.18)	(0.16)	(0.20)
IMR	-0.5384**	-0.6014***	-0.5131**	-0.5146**	-0.5071**	-0.5151**
	(-2.49)	(-2.80)	(-2.33)	(-2.32)	(-2.31)	(-2.32)
Constant	0.2865	0.2069	0.3255	0.2762	0.3032	0.2333
	(0.16)	(0.11)	(0.18)	(0.15)	(0.17)	(0.13)
Category Fixed Effects	YES	YES	YES	YES	YES	YES
Month Fixed Effects	YES	YES	YES	YES	YES	YES
Observations	17,707	17,707	17,707	17,707	17,707	17,707
Adjusted R^2	.0645	.0638	.0647	.0647	.065	.0646

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 7: ESG Disclosures and Fund Returns

Table 7 presents estimated coefficients from pooled OLS regressions, examining fund returns based on ESG disclosure measures and controlling for other fund characteristics. The dependent variable, *Carhart 4-factor alpha*, represents the monthly fund alpha estimated using the Carhart (1997) 4-factor model with monthly fund and factor returns. All other specifications align with those in Table 6. We also control for the fund's characteristics and other textual variables, as well as the *IMR* generated from the first-stage Heckman procedure. Definitions for all explanatory variables can be found in Table 2 and Table 4. Each specification includes fund category and month fixed effects. t-statistics are given in parentheses, with standard errors clustered by fund and month. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Carhart 4-factor alpha					
	(1)	(2)	(3)	(4)	(5)	(6)
Specific ESG text(rank)	0.0004		0.0004			
	(1.39)		(1.44)			
Environmental text(rank)				0.0003		
				(1.18)		
Social text(rank)					0.0004	
					(1.54)	
Governance text(rank)						0.0002
						(0.78)
Generic ESG text(rank)		0.0001	0.0001	0.0001	0.0001	0.0001
		(0.32)	(0.45)	(0.43)	(0.46)	(0.39)
Holding weighted ESG score(rank)	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001
	(-0.39)	(-0.41)	(-0.35)	(-0.37)	(-0.33)	(-0.37)
Past 12-month net returns	0.1037***	0.1041***	0.1037***	0.1037***	0.1035***	0.1039***
	(7.50)	(7.55)	(7.52)	(7.52)	(7.52)	(7.53)
Fund size	0.0254***	0.0247***	0.0254***	0.0253***	0.0253***	0.0250***
	(4.62)	(4.42)	(4.61)	(4.57)	(4.57)	(4.51)
Fund age	-0.0030***	-0.0030***	-0.0030***	-0.0030***	-0.0030***	-0.0030***
	(-3.51)	(-3.51)	(-3.45)	(-3.45)	(-3.44)	(-3.46)
Log(PIS length)	-0.0725**	-0.0694**	-0.0742**	-0.0733**	-0.0742**	-0.0717**
	(-2.12)	(-2.10)	(-2.21)	(-2.18)	(-2.23)	(-2.13)
Turnover ratio	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	(0.19)	(0.14)	(0.21)	(0.23)	(0.22)	(0.18)
Log(Fund expense)	-0.0487***	-0.0488***	-0.0487***	-0.0487***	-0.0487***	-0.0487***
	(-3.04)	(-3.03)	(-3.04)	(-3.05)	(-3.05)	(-3.04)
Text readability (Flesch-Kincaid grade)	0.0050	0.0056	0.0049	0.0051	0.0050	0.0054
	(0.77)	(0.86)	(0.75)	(0.78)	(0.77)	(0.82)
Text tonality (Positive word freq, as %)	0.0273**	0.0275**	0.0270**	0.0269**	0.0272**	0.0273**
	(2.45)	(2.45)	(2.41)	(2.41)	(2.42)	(2.44)
Text tonality (Negative word freq, as %)	0.0078	0.0104	0.0078	0.0080	0.0076	0.0093
	(0.43)	(0.58)	(0.43)	(0.44)	(0.42)	(0.52)
Text tonality (Uncertain word freq, as %)	0.0003	-0.0040	0.0002	-0.0003	0.0004	-0.0019
	(0.03)	(-0.38)	(0.02)	(-0.03)	(0.03)	(-0.18)
Text tonality (Litigious word freq, as %)	-0.0434	-0.0328	-0.0422	-0.0409	-0.0424	-0.0375
	(-1.05)	(-0.84)	(-1.05)	(-1.02)	(-1.05)	(-0.93)
IMR	-0.0570***	-0.0619***	-0.0558***	-0.0568***	-0.0560***	-0.0586***
	(-3.35)	(-3.60)	(-3.16)	(-3.20)	(-3.17)	(-3.32)
Constant	-0.0348	-0.0374	-0.0332	-0.0367	-0.0357	-0.0388
	(-0.17)	(-0.18)	(-0.16)	(-0.18)	(-0.17)	(-0.19)
Category Fixed Effects	YES	YES	YES	YES	YES	YES
Month Fixed Effects	YES	YES	YES	YES	YES	YES
Observations	15,613	15,613	15,613	15,613	15,613	15,613
Adjusted R^2	.594	.593	.594	.594	.594	.593

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 8: ESG Disclosures, Flow-Performance Sensitivity, and Asymmetry

Table 8 presents estimated coefficients from pooled OLS regressions, examining monthly fund flows based on ESG disclosure measures, past performance, and interaction terms. The aim is to study the effect of ESG disclosures on the sensitivity between fund flows and performance. Past performance is captured using the metric, *Past 12-month net returns*. In Panel A, the variables of interest are the ESG disclosure measures, Past performance, and their interaction term. Panel B distinguishes past performance into positive and negative components: a performance below zero is considered positive, while one above zero is deemed negative. All other specifications align with those in Table 6. We also control for the fund's characteristics and other textual variables, as well as the *IMR* generated from the first-stage Heckman procedure, collectively referred to as *Fund controls*. Definitions for all explanatory variables can be found in Table 2 and Table 4. Each specification includes fund category and month fixed effects. t-statistics are given in parentheses, with standard errors clustered by fund and month. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: ESG disclosures and flow-performance sensitivity

	Fund flows					
	(1)	(2)	(3)	(4)	(5)	(6)
Specific ESG text(rank)	0.0028		0.0031			
	(1.00)		(1.04)			
Specific ESG text(rank)*Past 12-month net returns	0.0027**		0.0027**			
	(2.41)		(2.33)			
Environmental text(rank)				0.0033		
				(1.16)		
Environmental text(rank)*Past 12-month net returns				0.0025**		
				(2.18)		
Social text(rank)					0.0040	
					(1.43)	
Social text(rank)*Past 12-month net returns					0.0024**	
					(2.14)	
Governance text(rank)						0.0030
						(1.08)
Goverance text(rank)*Past 12-month net returns						0.0024**
						(2.14)
Generic ESG text(rank)		0.0016	0.0018	0.0019	0.0020	0.0019
		(0.47)	(0.53)	(0.54)	(0.58)	(0.54)
Generic ESG text(rank)*Past 12-month net returns		0.0009	0.0010	0.0010	0.0009	0.0009
		(0.58)	(0.61)	(0.61)	(0.59)	(0.59)
Past 12-month net returns	0.9649***	1.0175***	0.9211***	0.9294***	0.9279***	0.9342***
	(6.48)	(6.45)	(5.43)	(5.52)	(5.53)	(5.52)
Constant	0.2803	0.2773	0.3900	0.3474	0.3665	0.2933
	(0.16)	(0.15)	(0.22)	(0.19)	(0.21)	(0.16)
Fund controls	YES	YES	YES	YES	YES	YES
Category Fixed Effects	YES	YES	YES	YES	YES	YES
Month Fixed Effects	YES	YES	YES	YES	YES	YES
Observations	17,707	17,707	17,707	17,707	17,707	17,707
Adjusted R^2	.0652	.0638	.0653	.0652	.0654	.0651

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Panel B: ESG disclosures and flow-performance sensitivity asymmetry

	Fund flows					
	(1)	(2)	(3)	(4)	(5)	(6)
Specific ESG text(rank)	0.0013 (0.37)		0.0017 (0.48)			
Specific ESG text(rank)* Positive past 12-month net returns	0.0035** (2.54)		0.0034** (2.46)			
Specific ESG text(rank)* Negative past 12-month net returns	-0.0001 (-0.04)		0.0003 (0.08)			
Environmental text(rank)				0.0012 (0.35)		
Environmental text(rank)* Positive past 12-month net returns				0.0036*** (2.65)		
Environmental text(rank)* Negative past 12-month net returns				-0.0012 (-0.36)		
Social text(rank)					0.0028 (0.83)	
Social text(rank)* Positive past 12-month net returns					0.0031** (2.22)	
Social text(rank)* Negative past 12-month net returns					0.0001 (0.04)	
Governance text(rank)						0.0014 (0.40)
Goverance text(rank)* Positive past 12-month net returns						0.0033** (2.32)
Goverance text(rank)* Negative past 12-month net returns						-0.0005 (-0.16)
Generic ESG text(rank)		0.0026 (0.58)	0.0031 (0.67)	0.0030 (0.65)	0.0033 (0.71)	0.0030 (0.66)
Generic ESG text(rank)* Positive past 12-month net returns		0.0004 (0.16)	0.0002 (0.11)	0.0003 (0.13)	0.0002 (0.09)	0.0003 (0.11)
Generic ESG text(rank)* Negative past 12-month net returns		0.0026 (0.65)	0.0027 (0.63)	0.0024 (0.55)	0.0027 (0.64)	0.0025 (0.59)
Positive past 12-month net returns	1.0910*** (5.95)	1.2044*** (6.00)	1.0853*** (5.05)	1.0776*** (5.06)	1.0948*** (5.12)	1.0925*** (5.08)
Negative past 12-month net returns	0.6839** (2.42)	0.5559 (1.62)	0.5422 (1.37)	0.6004 (1.50)	0.5415 (1.38)	0.5730 (1.43)
Constant	0.1082 (0.06)	-0.0640 (-0.03)	0.1299 (0.07)	0.1349 (0.07)	0.1041 (0.06)	0.0540 (0.03)
Fund controls	YES	YES	YES	YES	YES	YES
Category Fixed Effects	YES	YES	YES	YES	YES	YES
Month Fixed Effects	YES	YES	YES	YES	YES	YES
Observations	17,707	17,707	17,707	17,707	17,707	17,707
Adjusted R^2	.0658	.0644	.0658	.0659	.066	.0657

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 9: ESG Disclosures and Climate Concerns

Table 9 presents estimated coefficients from pooled OLS regressions, examining fund flows in relation to ESG disclosure measures across varying climate concern periods. The climate concerns are assessed using the climate concern index (MCCC). Panel A captures observations during periods when the climate concern index is greater than or equal to the average climate concern index from 2010 to 2022. Conversely, Panel B includes observations from periods when the climate concern index is below this average. Column 1 utilizes the *Specific ESG text (rank)* as its disclosure variable; Column 2 uses the *Generic ESG text (rank)*. Column 3 encompasses both *Specific ESG text (rank)* and *Generic ESG text (rank)*, while Column 4 combines *Environmental text (rank)* with *Generic ESG text (rank)*. We also control for the fund's characteristics and other textual variables, as well as the *IMR* generated from the first-stage Heckman procedure, collectively referred to as *Fund controls*. Definitions for all explanatory variables can be found in Table 2 and Table 4. Each specification includes fund category and month fixed effects. t-statistics are given in parentheses, with standard errors clustered by fund and month. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: High climate concerns period

	Fund flows			
	(1)	(2)	(3)	(4)
Specific ESG text(rank)	0.0076***		0.0078***	
	(2.68)		(2.73)	
Environmental text(rank)				0.0073**
				(2.63)
Generic ESG text(rank)		0.0017	0.0026	0.0024
		(0.48)	(0.71)	(0.67)
Constant	1.9587	1.8947	2.0054	1.9454
	(0.84)	(0.80)	(0.87)	(0.84)
Fund controls	YES	YES	YES	YES
Category Fixed Effects	YES	YES	YES	YES
Month Fixed Effects	YES	YES	YES	YES
Observations	11,735	11,735	11,735	11,735
Adjusted R^2	.0762	.0746	.0762	.076

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Panel B: Low climate concerns period

	Fund flows			
	(1)	(2)	(3)	(4)
Specific ESG text(rank)	-0.0003		0.0001	
	(-0.07)		(0.02)	
Environmental text(rank)				0.0014
				(0.34)
Generic ESG text(rank)		0.0052	0.0052	0.0053
		(1.16)	(1.16)	(1.19)
Constant	-2.6459	-2.6485	-2.6466	-2.6261
	(-1.31)	(-1.29)	(-1.29)	(-1.28)
Fund controls	YES	YES	YES	YES
Category Fixed Effects	YES	YES	YES	YES
Month Fixed Effects	YES	YES	YES	YES
Observations	5,972	5,972	5,972	5,972
Adjusted R^2	.0666	.0673	.0672	.0672

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 10: Robustness test: Alternative Measurements

Table 10 presents estimated coefficients from pooled OLS regressions, analyzing fund flows based on alternative ESG disclosure measures. In columns 1-3, the ESG disclosure variable is calculated as the natural logarithm of the word length of ESG text within a fund's PIS section: *Log(Specific ESG text)* in column 1, *Log(Generic ESG text)* in column 2, and both in column 3. In columns 4-6, the ESG disclosure variable is determined by the ratio of the word length of ESG text in the PIS section to the entire PIS section's length: *Specific ESG text(%)* in column 4, *Generic ESG text(%)* in column 5, and both in column 6. We also control for the fund's characteristics and other textual variables, as well as the *IMR* generated from the first-stage Heckman procedure. Definitions for all explanatory variables can be found in Table 2 and Table 4. Each specification includes fund category and month fixed effects. t-statistics are given in parentheses, with standard errors clustered by fund and month. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Fund flows					
	(1)	(2)	(3)	(4)	(5)	(6)
Log(Specific ESG text)	0.1198**		0.1224**			
	(2.29)		(2.27)			
Log(Generic ESG text)		-0.0207	0.0133			
		(-0.31)	(0.19)			
Specific ESG text(%)				1.3640		1.3077
				(1.26)		(1.21)
Generic ESG text(%)					0.8310	0.7214
					(0.91)	(0.80)
Holding weighted ESG score(rank)	-0.0026	-0.0029	-0.0025	-0.0026	-0.0026	-0.0024
	(-0.95)	(-1.06)	(-0.94)	(-0.95)	(-0.98)	(-0.90)
Past 12-month net returns	1.0502***	1.0587***	1.0505***	1.0551***	1.0605***	1.0561***
	(7.30)	(7.34)	(7.30)	(7.34)	(7.39)	(7.36)
Fund size	0.1375**	0.1248*	0.1375**	0.1358*	0.1244*	0.1354*
	(1.98)	(1.86)	(1.99)	(1.95)	(1.86)	(1.95)
Fund age	-0.0515***	-0.0524***	-0.0514***	-0.0516***	-0.0517***	-0.0512***
	(-6.01)	(-5.97)	(-5.91)	(-6.01)	(-5.94)	(-5.91)
Log(PIS length)	-0.1157	-0.0240	-0.1228	-0.0245	0.0010	0.0041
	(-0.44)	(-0.09)	(-0.46)	(-0.09)	(0.00)	(0.02)
Turnover ratio	-0.0021	-0.0023	-0.0021	-0.0021	-0.0022	-0.0021
	(-1.23)	(-1.29)	(-1.21)	(-1.20)	(-1.25)	(-1.17)
Log(Fund expense)	0.3469	0.3486	0.3465	0.3460	0.3603	0.3567
	(0.93)	(0.93)	(0.93)	(0.93)	(0.97)	(0.96)
Text readability (Flesch-Kincaid grade)	-0.0011	0.0115	-0.0017	0.0025	0.0085	0.0006
	(-0.02)	(0.23)	(-0.03)	(0.05)	(0.17)	(0.01)
Text tonality (Positive word freq, as %)	0.1021	0.1131	0.1014	0.0905	0.1121	0.0913
	(0.81)	(0.90)	(0.80)	(0.72)	(0.90)	(0.72)
Text tonality (Negative word freq, as %)	-0.1735	-0.1312	-0.1734	-0.1639	-0.1242	-0.1577
	(-1.03)	(-0.78)	(-1.03)	(-0.97)	(-0.74)	(-0.94)
Text tonality (Uncertain word freq, as %)	0.2119*	0.1498	0.2113*	0.1854	0.1421	0.1799
	(1.85)	(1.33)	(1.83)	(1.64)	(1.28)	(1.58)
Text tonality (Litigious word freq, as %)	0.0454	0.1667	0.0539	0.1340	0.2176	0.1645
	(0.09)	(0.33)	(0.11)	(0.27)	(0.43)	(0.33)
IMR	-0.5251**	-0.6293***	-0.5166**	-0.5480**	-0.5987***	-0.5331**
	(-2.42)	(-2.91)	(-2.31)	(-2.45)	(-2.82)	(-2.38)
Constant	0.3371	0.1984	0.3281	-0.0546	-0.1172	-0.3020
	(0.19)	(0.11)	(0.18)	(-0.03)	(-0.06)	(-0.16)
Category Fixed Effects	YES	YES	YES	YES	YES	YES
Month Fixed Effects	YES	YES	YES	YES	YES	YES
Observations	17,707	17,707	17,707	17,707	17,707	17,707
Adjusted R^2	.0648	.0637	.0648	.0642	.0639	.0642

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Appendix A   Variable definition

Variables	Definitions	Source
*(a) **ESG disclosure variables***		
Specific ESG text(rank)	This variable represents the relative percentile ranking of the total word length of specific ESG sentences within the PIS section of a mutual fund prospectus, compared to other mutual funds in the same month. Mutual funds are ranked based on the percentiles of their specific ESG text disclosures, with higher ranks denoting longer specific ESG texts within their PIS sections.	SEC EDGAR & self-constructed
Generic ESG text(rank)	This variable represents the relative percentile ranking of the total word length of generic ESG sentences within the PIS section of a mutual fund prospectus, compared to other mutual funds in the same month. Mutual funds are ranked based on the percentiles of their generic ESG text disclosures, with higher ranks denoting longer generic ESG texts within their PIS sections.	SEC EDGAR & self-constructed
Environmental text (rank)	This variable refers to the relative percentile ranking of the total word length of environmental text in the specific text of funds' PIS sections, compared to other mutual funds in the same month. The word length of environmental text is calculated as an accumulation of the "Environmental" score of a specific ESG sentence multiplied by its word length.	SEC EDGAR & self-constructed
Social text(rank)	This variable refers to the relative percentile ranking of the total word length of social text in the specific text of funds' PIS sections, compared to other mutual funds in the same month. The word length of social text is calculated as an accumulation of the "Social" score of a specific ESG sentence multiplied by its word length.	SEC EDGAR & self-constructed
Governance text(rank)	This variable refers to the relative percentile ranking of the total word length of governance text in the specific text of funds' PIS sections, compared to other mutual funds in the same month. The word length of governance text is calculated as an accumulation of the "Governance" score of a specific ESG sentence multiplied by its word length.	SEC EDGAR & self-constructed
Log(Specific ESG text)	This variable refers to the natural logarithm of the total word length of specific ESG sentences within the PIS section of a mutual fund prospectus.	SEC EDGAR & self-constructed
Log(Generic ESG text)	This variable refers to the natural logarithm of the total word length of generic ESG sentences within the PIS section of a mutual fund prospectus.	SEC EDGAR & self-constructed

Variables	Definitions	Source
Specific ESG text(%)	This variable refers to the ratio of the word length of specific ESG sentences in the PIS section to the entire PIS section's length.	SEC EDGAR & self-constructed
Generic ESG text(%)	This variable refers to the ratio of the word length of generic ESG sentences in the PIS section to the entire PIS section's length.	SEC EDGAR & self-constructed
ESG disclosure dummy	This variable is an indicator variable that takes a value of 1 if a fund-month observation discloses ESG-related texts in the fund's PIS section; otherwise, it is 0.	SEC EDGAR & self-constructed

(b) *Fund characteristics*

Variables	Definitions	Source
Fund flows	A financial metric quantifying the net inflow or outflow of funds from an investment fund within a month, expressed as a percentage. It is computed by dividing the net inflow or outflow by the total asset value from the preceding month, which is then multiplied by (1 + the fund return during the current month).	MorningStar & self-constructed
Sustainable fund	An indication whether the fund is a considered to be a sustainable investment product. A fund will be considered a sustainable investment product if the in the prospectus or other regulatory filings it is described as focusing on sustainability, impact investing, or environmental, social or governance factors.	MorningStar
Prob_disclosures	This variable refers to the ratio of the number of funds in a Morningstar category that disclose ESG-realted text to the total number of funds in this category in a month.	MorningStar & self-constructed
Holdings weighted ESG score(rank)	This variable is the relative percentile ranking of the numeric value that represents the measured average of the environmental, social, and governance (ESG) scores of a portfolio's holdings. The rank is compared to other portfolios in the same month. Higher ranks indicate portfolios with a higher average ESG score among their holdings.	MorningStar & Refinitiv Eikon & self-constructed
Past 12-month net returns(%)	The returns generated by funds over the preceding 12-month period, adjusted for fund expenses.	MorningStar
Positive past 12-month net returns(%)	Past 12-month net returns of zero or above are deemed positive; positive performance is preserved, while negative performance is replaced with zero.	MorningStar

Variables	Definitions	Source
Negative past 12-month net returns(%)	Past 12-month net returns below zero are considered negative; negative performance is maintained, while positive performance is substituted with zero.	MorningStar
Fund size	The natural logarithm of the fund's total net assets (measured in US million).	MorningStar
Fund age	A variable calculated by subtracting the fund's inception year from the current year.	MorningStar
Log(PIS length)	The natural logarithm of the total word length of a mutual fund's PIS section.	SEC EDGAR & self-constructs
Turnover ratio(%)	The ratio is calculated by taking the value of all transactions (both buying and selling), dividing that sum by two, and then dividing the result by the fund's total holdings.	SEC EDGAR
Log(Fund expense)	The natural logarithm of the percentage of fund assets used to pay for operating expenses and management fees, including 12b-1 fees, administrative fees, and all other asset-based costs incurred by the fund, except brokerage costs.	MorningStar

(c) Other textual variables

Variables	Definitions	Source
Text readability (Flesch-Kincaid grade)	Text readability is calculated using the Flesch-Kincaid grade for texts within a fund's PIS section. The Flesch-Kincaid grading tests consider both sentence and word counts to derive readability scores. These scores offer valuable insights into the text's comprehensibility, where higher grades indicate increased difficulty in understanding.	Self-constructs
Text tonality (Positive /Negative /Uncertain /Litigious word freq, as %)	Text tonality is gauged by determining the frequency, expressed as a percentage, of positive, negative, uncertain, and litigious words as defined by the Loughran-McDonald sentiment word lists.	Loughran-McDonald Sentiment Word Lists

(d) Others

Variables	Definitions	Source
IMR	The inverse mills ratio calculated in first-stage of the Heckman selection model.	Self-constructs

Appendix B   Sample of sentence classification

Appendix B gives five examples of specific ESG sentences and five examples of generic ESG sentences derived from mutual fund PIS sections. These examples were generated utilizing the Hugging-Face 'facebook/bart-large-mnli' model and the 'zero-shot-classification' task pipeline. By setting the 'multi_label' parameter to True, the classification model treats each class as independent, and probabilities are normalized through the application of the SoftMax function. The results indicate predicted scores for both 'ESG issue' and 'specific ESG issue' classifications. Sentences with scores exceeding 0.8 in the 'ESG issue' category are labelled as ESG sentences. Meanwhile, those with scores above 0.6 in the 'specific ESG issue' category are considered specific ESG sentences, with the remaining classified as generic ESG sentences.

Examples of specific ESG sentences

- **Sentence**: For example, the Fund may invest in companies that focus on lowering the cost of healthcare, combatting the opioid epidemic, or offering ethically sourced products.
  Labels: [ESG issue, specific ESG issue], **scores**: [0.8987, 0.8443]

- **Sentence**: The Fund attempts to achieve investment results that reflect the return of the U.S. stock market as represented by its benchmark index, the Russell 3000®Index, while investing in companies whose activities are consistent with the Fund's ESG criteria, which include additional criteria relating to carbon emissions and fossil fuel reserves.
  Labels: [ESG issue, specific ESG issue], **scores**: [0.9415, 0.8189]

- **Sentence**: Companies that are involved in specific business activities which have high potential for negative social and/or environmental impact, such as alcohol, gambling, tobacco, nuclear power, conventional weapons, nuclear weapons, controversial weapons and civilian firearms, are ineligible for inclusion.
  Labels: [ESG issue, specific ESG issue], **scores**: [0.9216, 0.8008]

- **Sentence**: The Index Provider excludes any companies with a carbon-to-revenue footprint standard score of greater than three.
  Labels: [ESG issue, specific ESG issue], **scores**: [0.8617, 0.7024]

- **Sentence**: It is our experience that it is the governance element that also leads to Environmental and Social improvements in the business practices of our portfolio companies.
  Labels: [ESG issue, specific ESG issue], **scores**: [0.9411, 0.6138]

Examples of generic ESG sentences

- **Sentence**: The investment team may also consider the risks and return potential presented by environmental, social, and governance (ESG) factors in investment decisions.
  Labels: [ESG issue, specific ESG issue], **scores**: [0.8879, 0.2837]

- **Sentence**: To achieve its investment objective, the Fund invests in, or seeks exposure to, companies based on various financial factors and fundamental sustainability factors such as environmental, social and governance performance of such companies.
  Labels: [ESG issue, specific ESG issue], **scores**: [0.8940, 0.5150]

- **Sentence**: The Fund's advisor, Eventide Asset Management, LLC ("Eventide"or the"Advisor") analyzes the performance of potential investments not only for financial strengths and outlook, but also for the company's ability to operate with integrity and create value for customers, shareholders and society.
  Labels: [ESG issue, specific ESG issue], **scores**: [0.8072, 0.4447]

- **Sentence**: The Fund maintains a portfolio of stocks intended to parallel the investment performance of the U.S. large cap value equities market, while incorporating socially responsible investing criteria.
  Labels: [ESG issue, specific ESG issue], **scores**: [0.8938, 0.4628]

- **Sentence**: The Adviser assesses a company's Environmental, Social and Governance ("ESG") profile through conducting ESG research and leveraging engagement when appropriate through dialogue with company management teams as part of its fundamental due diligence process.
  Labels: [ESG issue, specific ESG issue], **scores**: [0.9071, 0.4753]

Appendix C   Sample of PIS text

Appendix C provides excerpts from mutual fund PIS sections that encompass ESG statements and specific ESG disclosures addressing granular ESG issues. PIS sections include specific disclosures that address ESG concerns in more detail, generic ESG sentences and non-ESG sentences. Specific ESG sentences are indicated with bold red typeface, while generic ESG sentences are bold black. In the classification process for the Environmental, Social, Governance, and Other (E/S/G/O) categories, the 'multi_label' parameter is set to False. This leads to score normalization, ensuring the total probability of labels for each sequence equates to 1. Below each specific ESG statement are the corresponding text-based E/S/G/O scores. The italicized text following the PIS text illustrates the classification variables' outcomes.

Fund Name: Vanguard Baillie Gifford Global Positive Impact Stock Fund,
Prospectus Date: April 2022

[**Under normal circumstances, the Fund invests at least 80% of its net assets (plus any borrowings for investment purposes) in stocks of companies that Baillie Gifford Overseas Limited, the Fund's advisor (Baillie Gifford) determines contribute towards a more sustainable and inclusive world.** The Fund seeks to meet its investment objective by investing in a global portfolio of stocks of companies located in a number of countries throughout the world, including in developed, emerging, and frontier markets. The Fund invests in common and preferred stocks directly, such as through trading on local stock markets around the world, and indirectly, such as through depositary receipts. The Fund is not constrained with respect to market capitalization or industry allocation.

The portfolio managers employ a bottom-up approach to stock selection and select companies without being constrained by any benchmark or securities index. The portfolio managers focus on company research and the long-term outlook of companies and industries. Ideas can come from a wide variety of sources, including, but not limited to, research trips, company meetings, and relationships with industry thought leaders and academic institutions. Stock ideas are normally researched to assess a range of factors, including: long-term growth potential, geographic and industry positioning, competitive advantage (or attributes that give a company a favorable business position relative to its competitors), management, financial strength and valuation. **In parallel, the portfolio managers assess potential holdings' contributions to sustainability and inclusiveness, focusing on the ability of companies to deliver positive change in areas including: (1) Social Inclusion and Education, focusing on a more inclusive society and access to and quality of education; (2) Healthcare and Quality of Life, focusing on improving healthcare that affects quality of life; (3) Environment and Resource Needs, focusing on environmental impacts that affect basic resources; and (4) Base of the Pyramid, focusing on addressing the needs of the poorest populations ('labels': ['social', 'others', 'environmental', 'governance'], 'scores': [0.7019, 0.1507, 0.1361, 0.0113]).** The portfolio managers assess positive change across these four categories by considering the company's intent, how its products and services contribute to solving a global challenge, and the company's business practices. To measure and report on impact, the portfolio managers monitor the progress of each issuer using metrics and/or milestones specific to each

company and selected by Baillie Gifford. The portfolio managers pursue an active, positive approach; investment decisions are generally not made on the basis of negative "screening" of companies viewed as socially irresponsible.

The intended outcome is a portfolio of between 25 and 50 growth companies with the potential to outperform the Fund's benchmark over the long term and which the portfolio managers consider to have core ambitions of delivering a positive change. The process can result in significant exposure to a single country or a small number of countries.

The Fund is a non-diversified fund, which means that it may invest a relatively large percentage of its assets in a small number of issuers, industries or sectors. The Fund aims to hold securities for long periods (typically 5-10 years), which results in relatively low portfolio turnover and is in line with the Fund's long-term investment outlook.

The Fund may invest without limitation in securities quoted or denominated in currencies other than the U.S. dollar and may hold such currencies. The Fund does not expect to engage in currency hedging and thus expects to be fully exposed to currency fluctuations relative to the U.S. dollar.]

Interpretation: The total word count is 554, with a specific ESG sentence being 82 words long and a generic ESG sentence being 43 words long. The length of the environmental text is 58, calculated by multiplying 82 words by a score of 0.7019 for "environmental". The social text length is 11, derived from 82 words multiplied by a score of 0.1361 for "social". Lastly, the governance text length is 1, obtained by multiplying 82 words by a score of 0.0113 for "governance".

Fund Name: American Century Investments Balanced Fund,
Prospectus Date: March 2022

[For the equity portion of the fund, the fund will generally invest in large capitalization companies it believes show sustainable business improvement using a proprietary multi-factor model that combines fundamental measures of a stock's value and growth potential with environmental, social, and governance (ESG) metrics. The model assigns each security a financial metrics score and an ESG score that are combined to create an overall score.

To measure value, the portfolio managers may use ratios of stock price-to-earnings and stock price-to-cash flow. To measure growth, the managers may use the rate of growth of a company's earnings and cash flow and changes in its earnings estimates. The model also considers price momentum. **The team arrives at an ESG score by evaluating multiple metrics of each ESG characteristic—environmental, social, and governance.** The portfolio managers utilize internal data and research, as well as third party commercial data sources and scoring systems, to evaluate each security's ESG characteristics. ('labels': ['others', 'social', 'governance', 'environmental'], 'scores': [0.6062, 0.1549, 0.1358, 0.1031]) For example, portfolio managers will consider, among others, a company's carbon emission profile (environmental), a company's employee turnover rates and digital privacy (social), and a company's corporate leadership, including board chair independence and the independence of audit and compensation committees (governance). (['environmental', 'others', 'governance', 'social'], 'scores': [0.5015, 0.2859, 0.1324, 0.0803]) If information on a specific metric is unavailable, the security may still be selected for the portfolio if the portfolio managers believe they can evaluate the security qualitatively, or if the financial metrics and remaining ESG scores merit investment.

Final scores for each security are evaluated on a sector-specific basis, and the fund seeks to hold securities with the strongest scores in their respective sectors. **Using this process, the portfolio managers attempt to build a portfolio of stocks that has sustainable competitive advantages, provides better returns without taking on significant additional risk, and maintains a stronger ESG profile than the S&P 500 Index.**

For the fixed-income portion of the fund, the portfolio managers invest in a diversified portfolio of high- and medium-grade non-money market debt securities. These securities, which may be payable in U.S. or foreign currencies, may include corporate bonds and notes, government securities, bank loans, securities backed by mortgages or other assets and collateralized debt obligations (including collateralized loan obligations). Shorter-term debt securities round out the portfolio.]

Interpretation: The total word count is 365, with two specific ESG sentences amounting to 65 words (25 + 40) in total and three generic ESG sentences totaling 104 words (45 + 21 + 38). The environmental text length is 23, calculated as (25 words X 0.1031) + (40 words X 0.5015). The social text length is 7, determined by (25 words X 0.1549) + (40 words X 0.0803). Lastly, the governance text length is 9, computed as (25 words X 0.1358) + (40 words X 0.1324).

Fund Name: John Hancock Emerging Markets Equity Fund
Prospectus Date: March 2022

[Under normal market conditions, the fund invests at least 80% of its net assets (plus any borrowings for investment purposes) in equity and equity-related securities of emerging-market issuers. The manager may consider, but is not limited to, the classifications by the World Bank, the International Finance Corporation, or the United Nations and its agencies in determining whether a country is an emerging- or a developed-market country. The fund seeks to invest in securities that the manager considers to be undervalued or otherwise offer good prospects for capital growth.

The fund intends to invest in equity securities listed on bonafide securities exchanges or actively traded on over-the-counter markets. Equity and equity-related securities include common stocks, preferred stocks, convertible securities, warrants, and other similar securities. The fund may also invest in other investment companies (including closed-end funds) and other pooled investment vehicles that also invest in developing or emerging market economies. Fundamentals-based stock selection lies at the heart of the manager's investment process, which focuses on high quality companies within a diverse range of dynamic emerging economies. The manager seeks to invest in companies with strong assets that exhibit balance sheet strength, superior management, and high levels of free cash-flow to support a sustainable dividend payout. Although, there is no sector or geographical bias, the fund may focus its investments in a particular sector or sectors of the economy. The fund may invest in companies of any market capitalization.

The manager considers environmental, social, and/or governance (ESG) factors, alongside other relevant factors, as part of its investment process. The ESG characteristics utilized in the fund's investment process may change over time and one or more characteristics may not be relevant with respect to all issuers that are eligible fund investments.

Due to volatile conditions in emerging markets, the fund's investment process may result in a higher-than-average portfolio turnover ratio, which could increase transaction costs.

The fund may attempt to mitigate the risk of unintended currency fluctuations through the use of exchange-listed or over-the-counter financial derivatives instruments, including currency forwards, non-deliverable forwards, currency options, and index options. The fund may also enter into forward currency contracts to facilitate the settlement of foreign securities purchases, repatriation of foreign currency balances, or exchange of one currency to another. The fund may use derivatives such as futures contracts and options on futures contracts to gain market exposure on uninvested cash, pending investment in securities, or to maintain liquidity to pay redemptions.]

Interpretation: The total word count is 406, with the word length of two generic ESG sentences totaling 52 words (20+32), while no specific ESG sentences are present in this PIS.

Appendix D   Changes of classification thresholds

Appendix D.1   Number of sentences with different classification thresholds

This table presents the tabulation of classification results. In the first columns, we adjust the ESG classification threshold and the specific ESG classification threshold from 0.85 to 0.75, and from 0.7 to 0.5, respectively. The final three columns indicate the number of sentences (ESG sentences, specific ESG sentences, and generic ESG sentences, respectively) resulting from the classification.

ESG classification threshold	Specific ESG classification threshold	Total ESG sentences	Specific ESG sentences	Generic ESG sentences
0.85	0.7	7,268	2,545	4,723
0.85	0.6	7,268	3,597	3,671
0.85	0.5	7,268	4,697	2,571
0.8	0.7	8,944	2,870	6,074
0.8	0.6	8,944	4,182	4,762
0.8	0.5	8,944	5,562	3,382
0.75	0.7	10,389	3,065	7,324
0.75	0.6	10,389	4,591	5,798
0.75	0.5	10,389	6,205	4,184

Appendix D.2   Main regression result with higher thresholds

This table display the results of the main regression in this study, utilizing higher classification thresholds (classification thresholds for "ESG issues" at 0.85 and "specific ESG issues" at 0.7). All other specifications align with those in Table 6.

ESG Disclosures and Fund Flows

	Fund flows					
	(1)	(2)	(3)	(4)	(5)	(6)
Specific ESG text(rank)	0.0056*		0.0054*			
	(1.80)		(1.72)			
Environmental text(rank)				0.0057*		
				(1.92)		
Social text(rank)					0.0067**	
					(2.22)	
Governance text(rank)						0.0056*
						(1.93)
Generic ESG text(rank)		0.0055	0.0051	0.0050	0.0050	0.0050
		(1.51)	(1.40)	(1.37)	(1.36)	(1.37)
Holding weighted ESG score(rank)	-0.0031	-0.0035	-0.0029	-0.0029	-0.0026	-0.0027
	(-1.06)	(-1.21)	(-0.99)	(-0.98)	(-0.88)	(-0.94)
Past 12-month net returns	1.0450***	1.0614***	1.0483***	1.0473***	1.0433***	1.0470***
	(6.49)	(6.68)	(6.54)	(6.53)	(6.51)	(6.53)
Fund size	0.1331*	0.1146	0.1332*	0.1328*	0.1337*	0.1321*
	(1.80)	(1.60)	(1.80)	(1.82)	(1.83)	(1.80)
Fund age	-0.0463***	-0.0451***	-0.0450***	-0.0449***	-0.0451***	-0.0449***
	(-5.53)	(-5.38)	(-5.33)	(-5.32)	(-5.32)	(-5.30)
Log(PIS length)	-0.0407	-0.0124	-0.1055	-0.1104	-0.1281	-0.1077
	(-0.13)	(-0.04)	(-0.33)	(-0.35)	(-0.41)	(-0.34)
Turnover ratio	-0.0009	-0.0009	-0.0008	-0.0008	-0.0009	-0.0008
	(-0.51)	(-0.51)	(-0.44)	(-0.41)	(-0.48)	(-0.44)
Log(Fund expense)	0.0699	0.0725	0.0813	0.0815	0.0819	0.0803
	(0.20)	(0.21)	(0.23)	(0.23)	(0.23)	(0.23)
Text readability (Flesch-Kincaid grade)	-0.0235	-0.0197	-0.0288	-0.0287	-0.0280	-0.0257
	(-0.42)	(-0.36)	(-0.52)	(-0.53)	(-0.51)	(-0.47)
Text tonality (Positive word freq, as %)	0.1123	0.0972	0.0970	0.0937	0.1015	0.1005
	(0.81)	(0.71)	(0.70)	(0.67)	(0.73)	(0.72)
Text tonality (Negative word freq, as %)	-0.0352	0.0290	-0.0232	-0.0335	-0.0363	-0.0272
	(-0.19)	(0.16)	(-0.12)	(-0.18)	(-0.19)	(-0.15)
Text tonality (Uncertain word freq, as %)	0.1870	0.1383	0.1953	0.1995	0.2079*	0.1973
	(1.53)	(1.18)	(1.61)	(1.64)	(1.73)	(1.64)
Text tonality (Litigious word freq, as %)	0.2249	0.3085	0.2542	0.2511	0.2704	0.2690
	(0.41)	(0.56)	(0.47)	(0.46)	(0.51)	(0.50)
IMR	-0.5504**	-0.5623**	-0.5176**	-0.5181**	-0.5062**	-0.5140**
	(-2.59)	(-2.56)	(-2.40)	(-2.38)	(-2.35)	(-2.37)
Constant	0.2165	0.0785	0.3643	0.3866	0.4010	0.3049
	(0.10)	(0.04)	(0.17)	(0.18)	(0.19)	(0.14)
Category Fixed Effects	YES	YES	YES	YES	YES	YES
Month Fixed Effects	YES	YES	YES	YES	YES	YES
Observations	14,956	14,956	14,956	14,956	14,956	14,956
Adjusted R^2	.0585	.0582	.0589	.0591	.0594	.0591

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Appendix D.3   Main regression result with lower thresholds

These tables display the results of the main regression in this study, utilizing lower classification thresholds (classification thresholds for "ESG issues" at 0.75 and "specific ESG issues" at 0.5). All other specifications align with those in Table 6.

ESG Disclosures and Fund Flows

	Fund flows					
	(1)	(2)	(3)	(4)	(5)	(6)
Specific ESG text(rank)	0.0079***		0.0090***			
	(3.20)		(3.42)			
Environmental text(rank)				0.0081***		
				(3.08)		
Social text(rank)					0.0092***	
					(3.60)	
Governance text(rank)						0.0075***
						(3.00)
Generic ESG text(rank)		0.0019	0.0042	0.0040	0.0043	0.0040
		(0.69)	(1.49)	(1.41)	(1.54)	(1.41)
Holding weighted ESG score(rank)	-0.0002	-0.0006	0.0000	-0.0001	-0.0000	-0.0001
	(-0.07)	(-0.24)	(0.00)	(-0.06)	(-0.01)	(-0.05)
Past 12-month net returns	1.1042***	1.1180***	1.1087***	1.1116***	1.1067***	1.1137***
	(8.30)	(8.31)	(8.38)	(8.39)	(8.38)	(8.38)
Fund size	0.1048*	0.0859	0.1127**	0.1074*	0.1087*	0.1053*
	(1.85)	(1.55)	(1.99)	(1.93)	(1.93)	(1.87)
Fund age	-0.0465***	-0.0474***	-0.0459***	-0.0457***	-0.0460***	-0.0463***
	(-6.00)	(-5.99)	(-5.90)	(-5.89)	(-5.92)	(-5.92)
Log(PIS length)	-0.3405	-0.2983	-0.3457	-0.3342	-0.3339	-0.3312
	(-1.46)	(-1.26)	(-1.48)	(-1.43)	(-1.43)	(-1.40)
Turnover ratio	-0.0002	-0.0005	-0.0003	-0.0003	-0.0003	-0.0003
	(-0.11)	(-0.39)	(-0.19)	(-0.19)	(-0.23)	(-0.23)
Log(Fund expense)	0.2250	0.2139	0.2207	0.2204	0.2353	0.2232
	(0.98)	(0.92)	(0.95)	(0.95)	(1.01)	(0.96)
Text readability (Flesch-Kincaid grade)	0.0050	0.0293	0.0009	0.0075	-0.0001	0.0090
	(0.12)	(0.68)	(0.02)	(0.18)	(-0.00)	(0.21)
Text tonality (Positive word freq, as %)	0.1320	0.1507	0.1108	0.1127	0.1089	0.1242
	(1.16)	(1.32)	(0.95)	(0.96)	(0.94)	(1.07)
Text tonality (Negative word freq, as %)	-0.1245	-0.0849	-0.1189	-0.1241	-0.1256	-0.0961
	(-0.81)	(-0.54)	(-0.77)	(-0.80)	(-0.81)	(-0.62)
Text tonality (Uncertain word freq, as %)	0.1361	0.0838	0.1411	0.1367	0.1463	0.1235
	(1.36)	(0.84)	(1.41)	(1.35)	(1.47)	(1.25)
Text tonality (Litigious word freq, as %)	0.1808	0.3230	0.1676	0.1868	0.1497	0.2003
	(0.40)	(0.71)	(0.37)	(0.41)	(0.33)	(0.44)
IMR	-0.6304***	-0.7112***	-0.5434**	-0.5590**	-0.5404**	-0.5614**
	(-2.89)	(-3.30)	(-2.40)	(-2.44)	(-2.41)	(-2.47)
Constant	1.4256	1.3315	1.1235	1.0521	1.0791	1.0653
	(0.84)	(0.76)	(0.65)	(0.60)	(0.62)	(0.61)
Category Fixed Effects	YES	YES	YES	YES	YES	YES
Month Fixed Effects	YES	YES	YES	YES	YES	YES
Observations	21,548	21,548	21,548	21,548	21,548	21,548
Adjusted R^2	.0654	.0639	.0658	.0655	.066	.0652

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$