Voluntary ESG Disclosure and Heterogeneous Beliefs among ESG Investors

Michael D. Kimbrough*
University of Maryland-College Park
mkimbrou@umd.edu

Cong Tao
Lancaster University
cong.tao@lancaster.ac.uk

Xu (Frank) Wang
Saint Louis University
frank.wang@slu.edu

Sijing Wei
Creighton University
sijingwei@creighton.edu

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Abstract

Environmental, social, and governance (ESG) investors explicitly state that they consider ESG indicators in their investment strategies. Theoretically, these investors can use these indicators to meet dual objectives: maximizing investment returns through better fundamental analysis and maximizing the ESG performance of their portfolios by selecting the stocks of companies with business practices they view favorably. However, ESG investors may disagree about the investment implications of ESG indicators due in large part to the lack of transparent and credible ESG information. Therefore, we examine whether voluntary ESG reports reduce the disagreement among ESG investors, as measured by the dispersion in the excess weights on individual stocks in different actively managed ESG mutual funds' portfolios. We find that ESG disclosure is associated with a significant reduction in disagreement among ESG investors, indicating that ESG reports are beneficial to their target audience. The effect of ESG disclosure is enhanced when reports are more accessible and when they have more credibility-enhancing features. Disclosures on environmental and social matters contribute to the overall effect of ESG disclosure on disagreement among ESG investors. ESG reports have a greater impact on disagreement among ESG investors than among non-ESG investors, indicating that there are meaningful distinctions between the two classes of investors.

Keywords: Environmental, social, and governance (ESG) reporting; Voluntary disclosure; ESG investors; Dispersion in beliefs; Investor preferences; Assurance

JEL classifications: D83, G11, G24, M14, M41, Q56

***Corresponding author.** College Park, MD 20742, United States

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1. Introduction

Environmental, social, and governance (ESG) investors have arisen in recent years as an identifiable and increasingly influential class of investors who explicitly state that they consider ESG indicators in their investment strategies.[1] Theoretically, these investors can use these indicators to meet dual objectives: maximizing the investment returns through better fundamental analysis (value investing) and the ESG performance of their portfolios by selecting the stocks of companies with business practices they view favorably (values investing) (Starks, 2023).[2]

Despite the potential usefulness of ESG information for investment purposes, evidence on the challenges in interpreting ESG information suggests that ESG investors are likely to disagree about its implications for both value and values investing. From a value investing standpoint, prior research offers mixed evidence on the directional impact of firms' ESG performance on firm value[3], which may lead to differences in how ESG investors incorporate ESG indicators into their forecasting and valuation models. From a values investing standpoint, the previously documented disagreement among ESG raters about individual firms' ESG performance (e.g., Chatterji et al., 2016) demonstrates a high degree of subjectivity in assessing ESG performance, which likely also contributes to disagreement among ESG investors. Investor disagreement is associated with higher cost of capital (Jiang and Sun, 2014) and other significant asset pricing consequences (Carlin et al., 2014; Fama and French, 2007). Managers thus have incentives to mitigate disagreement among ESG investors by issuing voluntary disclosures upon which they can place common reliance.

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[1] According to a 2023 research report from the Governance & Accountability Institute (G&A), "G&A Institute's New Research Shows Big Jump in Sustainability Reporting by Mid-Cap U.S. Public Companies in 2022," 98% of S&P 500 companies as well as 90% of Total Russell 1000 companies published sustainability reports in 2022. Anecdotally, Ernst and Young promotes the importance of ESG reporting among investors as "[d]emand for ESG reporting is growing due to increased scrutiny from stakeholders, including investors who are looking for environmental, social and governance (ESG) disclosures to steer their investment decision-making." (EY, 2023)

[2] Pedersen et al. (2021) refers to investors who use ESG information for value investing as "ESG-aware" investor and investors who use ESG information for values investing as "ESG-motivated" investors.

[3] See Awaysheh et al. (2020), Lin et al. (2019), and Moser and Martin (2012) for reviews of studies on the link between ESG performance and firm value.

An emerging form of voluntary disclosure that coincides with the rise of ESG investors and is ostensibly tailored to meet their needs is the ESG report, which provides a host of non-financial metrics along with management commentary. From the firm's perspective, the success of voluntary disclosure can be measured by the extent to which it resolves costly disagreement among the targeted investors. Therefore, we examine the extent to which ESG reports resolve disagreement among ESG investors. The answer to this research question is important given the well-documented importance of investor disagreement and the fact that it is currently unclear whether ESG reports meet the needs of their intended audience—ESG investors.

Whether ESG reports can reduce disagreement among ESG investors depends on whether the reports provide a sufficient basis for common reliance and interpretation, which is not obvious given widespread concerns about the quality and credibility of the reports, which are not required to comply with a common reporting standard or to be externally assured (PwC, 2023). It also depends on the degree to which ESG investors have diverse priors when they analyze the reports. Although Kim and Verrecchia (1991) predict that public disclosure can promote consensus among investors, their later work (1994) show that public disclosure can promote further disagreement when agents have heterogeneous priors. Divergent views about the directional impact of ESG performance on firm value and the appropriate way to evaluate ESG performance suggest that ESG investors may start with varying assumptions, leading to different interpretations of ESG reports. It also depends on whether self-proclaimed ESG funds have similar commitments to the use of ESG indicators in their asset allocations. Heterogeneity in ESG funds' commitment to ESG (Raghunandan and Rajgopal, 2022) may further contribute to diverse interpretations of ESG reports.

We measure disagreement among fund managers based on the fact that actively managed funds are tied to a benchmark index, similar to Jiang and Sun (2014). We identify the benchmark index to which a fund is associated using an optimization technique that identifies the index fund with the most similar portfolio composition and weights. For individual stocks in the actively managed portfolio, we calculate deviations between the portfolio weights in the actively managed fund and the portfolio weights in the designated index based on individual fund managers' fundamental analysis activities. For ESG funds, we expect these deviations to primarily reflect differences in the fund managers' use of the ESG indicators of that particular company. Therefore, the standard deviation in this active weighting reflects disagreement among ESG investors about the implications of a firm's ESG indicators for value and values investing. We obtain ESG reports from Corporate Register combined with manual searches of company websites. We identify ESG funds from Morningstar Direct and regress the dispersion in excess portfolio weights on ESG disclosure as well as other previously documented determinants of dispersion. We measure ESG disclosure both as an indicator variable and a continuous variable that equals the length of the most recent ESG report for ESG disclosers, and zero otherwise.

In our main test, we find that ESG disclosure is associated with a significant reduction in disagreement among ESG investors. This result indicates that ESG reports promote alignment in investors' assessments of companies' ESG performance. To strengthen causal inference, we use Blackrock's 2018 Dear CEO letter as an exogenous source of pressure on firms held by Blackrock to issue ESG reports as it is the first year in which there was a significant call for disclosure that meets the interests of stakeholders and society at large. We use a difference-in-differences approach around the CEO letter and find that treated firms experience a significant reduction in their disagreement surrounding their initiation of ESG reporting in apparent response to the Dear CEO letter. This result strengthens causal inferences.

Next, we investigate cross-sectional variation in the effect of ESG disclosure based on the report's accessibility and credibility-enhancing features. Focusing on the accessibility feature, we find a more pronounced effect of ESG disclosure when reports are more readable and contain more images, both of which make the reports more accessible to readers. Regarding credibility-enhancing feature, we find that the effect of ESG disclosure is amplified when the reports are externally assured by accounting firms, include more external links that allow verification of the information contained in the reports, and use a more negative or neutral tone. These findings indicate that enhancing the accessibility and credibility of the ESG reports promotes more common reliance on them by ESG investors. Moreover, we conduct a topic coverage analysis and find that environmental and social disclosures contribute to the overall effect of ESG disclosure on investor disagreement, indicating that ESG investors consider these widely discussed topics to be value- and values-relevant.

In additional tests, we conduct a path analysis. Although less disagreement among ESG rating agencies translates into lower disagreement among ESG investors, the primary impact of ESG disclosure on ESG investor disagreement is direct and is not mediated by the separate impact of ESG disclosure on ESG rating agency disagreement. This finding indicates that ESG investors independently rely on the ESG reports rather than solely relying on intermediaries to summarize and communicate the information contained in them.

We further explore whether there are differences in the effect of ESG reports in resolving disagreement among ESG and non-ESG investors. While Edmans (2023) argues that that there is no practical difference between the approaches of ESG and non-ESG investors because ESG is simply a label for nonfinancial information that all classes of investors use, Pedersen et al. (2021) document that there are differences between investors who have a declared ESG orientation and those that do not in their demand for and use of ESG information in their investment strategies. Therefore, it is unclear whether ESG reports contribute disproportionately to ESG and non-ESG investors' investment strategies. The answer to this question is important for assessing the broad applications of ESG reports. Accordingly, we estimate our main model separately on dispersion among ESG and non-ESG investors and find that the negative association for non-ESG investors is less pronounced than the corresponding relation we document for ESG investors. This dramatic difference in the impact of ESG reports on the two classes of investors is consistent with Pedersen et al. (2021)'s intuition that investors have divergent demand and use of ESG information.

We conduct a battery of robustness tests, including use of a within-firm analysis of changes in disagreement around first-time ESG issuance, use of a first differencing model, use of an entropy balanced sample, controlling for dispersion in non-ESG investors' beliefs and dispersion among ESG raters, and alternative measurements of main variables. Our results are robust to these checks.

This study makes several contributions. First, our finding that ESG reports are associated with a significant resolution of disagreement among ESG investors provides the first evidence that ESG reports are beneficial to their intended users. The results of our path analysis show that the impact of ESG reports on ESG investor disagreement is direct and is not mediated by ESG rating agencies, indicating that ESG investors use and benefit from the reports. Additionally, our study is the first to apply Jiang and Sun (2014)'s methodology to directly measure disagreement among ESG investors. While researchers have extensively studied disagreement among ESG intermediaries (e.g., Berg et al., 2022; Chatterji et al., 2016), the application of Jiang and Sun (2014)'s methodology opens opportunities for further examination of disagreement among ESG investors, who are the ultimate decision makers.

Second, our study provides empirical evidence on the distinctions between ESG and non-

ESG investors. Specifically, our evidence that ESG reports have a greater impact on ESG investors indicates that ESG investors use such reports to a greater extent to increase their investment returns and the ESG performance of their stock portfolios. While some researchers question whether the ESG and non-ESG designations are merely labels (Edmans, 2023), our findings are consistent with the theoretical distinctions between those who explicitly incorporate ESG into their investment decisions and those who do not as described by Pedersen et al. (2021) and Starks (2023).

Third, our finding that the overall impact of the reports is driven by its impact on ESG-focused investors extends and provides new perspective on Dhaliwal et al. (2011)'s finding of a negative association between ESG disclosures and cost of capital, which they attribute to the fact that ESG reports are repositories of nonfinancial information that can be used generally for valuation. Our evidence that ESG reports have a greater impact in resolving disagreement among ESG investors than non-ESG investors, suggests that this class of investors contributes disproportionately to the effect of ESG reports on companies' cost of capital, highlighting the benefits of catering to this investor class through tailored disclosures.

Finally, our findings have practical implications for both managers and policymakers. The results of our in-depth content analysis provide practical insights for managers about specific ESG reporting choices that they can make to reduce costly disagreements among ESG investors, such as using more readable language, images, and external links, and obtaining external assurance from accounting firms. Our results also have implications for policymakers who face the challenge of meeting investor demand for reliable ESG data while avoiding perceptions of regulatory overreach. This trade-off is on display as the Securities and Exchange Commission pulls back from climate disclosure rule developed under the Biden administration. The Federal government's pull-back from climate disclosure regulation is being offset by more action in the other direction by the international community and by individual states. For instance, California passed two landmark climate disclosure laws in 2023. Our evidence that reporting on environmental topics is associated with reductions in disagreement among ESG investors demonstrates these investors are interested in transparent information about the climate-related issues that states such as California have included in their legislative agenda. Thus, even in the absence of formal mandates, policymakers and standard setters can use their influence to encourage companies to voluntarily disclose high-quality ESG information that allows investors to make informed decisions aligned with their own priorities. This non-partisan method supports investor autonomy and fosters market transparency.

2. Literature review, theory, and hypothesis development

2.1. ESG investors

Investors who trade on fundamentals utilize a combination of financial and non-financial indicators although they vary in the information they consider most important for their investment decisions. In recent years, there has been substantial growth in the class of investors who incorporate indicators of companies' ESG performance into their portfolio selections. A 2020 report by *The Forum for Sustainable and Responsible Investment* estimates that investment funds that incorporate ESG criteria accounted for $17 trillion in assets under management (AUM) (USSIF, 2020). Bloomberg estimates that the ESG funds' AUM will increase to $41 trillion globally by the end of 2022[4] and PwC expects "the share of ESG assets over total AUM would increase from 14.4% in 2021 to 21.5% in 2026, comprising more than one-fifth of all assets" (PwC, 2022, p.4) and Columbia Business School—The Eugene Lang Entrepreneurship Center (2023) reported in a Forbes article, "What ESG Investors Must Demand for Credible Sustainability Reporting" that ESG managed assets have surpassed $35 trillion worldwide in June 2023.

[4] The full article is accessible via https://www.bloomberg.com/company/press/esg-may-surpass-41-trillion-assets-in-2022-but-not-without-challenges-finds-bloomberg-intelligence/.

There are theoretically two, non-mutually exclusive motivations for investors to incorporate ESG information in their portfolio selections. First, the non-financial information in ESG reports could simply represent an expanded set of metrics investors can use in their forward-looking projections. Second, in addition to increasing their investment returns, ESG investors may have the additional objective of maximizing the ESG performance of their portfolios. As Starks (2023) argues, ESG information is potentially useful in value investing (i.e., maximizing investment return through the identification of mispriced stocks) and in *values* investing (i.e., selecting stocks with business practices the investors consider socially desirable). These possibilities align with Pedersen et al. (2021)'s characterization of "ESG-Aware" investors as those who incorporate ESG information into their trading strategies to maximize investment returns and "ESG-Motivated" investors as those who seek to use the information to meet the additional objective of selecting stocks for their portfolios that have high ESG performance.

2.2. Disagreement among ESG investors and ESG disclosure

2.2.1. Disagreement among ESG investors

An implication of the substantial amount of and growth in assets managed by ESG funds is that ESG investment strategies will likely have a significant impact on previously documented capital market outcomes. Specifically, prior research has documented differences among actively managed funds in excess portfolio weights for individual stocks (i.e., the difference between the portfolio weight for an individual stock in an actively managed portfolio and the weight on the stock in a corresponding benchmark index). A positive (negative) excess portfolio weight reflects overweighting (underweighting) of the stock by the active asset manager. Active managers overweight (underweight) stocks that they view favorably (unfavorably). Thus, the dispersion in excess portfolio weights reflects disagreement among asset managers.

Jiang and Sun (2014) show that this disagreement is positively associated with future returns, consistent with such disagreement being associated with higher expected returns or, equivalently, a higher equity cost of capital. A long line of literature documents the important economic consequences of investor disagreement (Carlin et al., 2014; Fama and French, 2007; Lintner, 1965). Al-Nasseri and Ali (2018, p.166) note that "[t]he impact of heterogeneity in investors' beliefs or opinions on stock market behavior has attracted considerable attention in recent years". Given the growing influence of ESG investors and the high potential for disagreement in the ESG context, more attention needs to focus specifically on disagreement among ESG investors. For ESG-focused asset managers, this disagreement is likely to relate specifically to ESG performance and/or its valuation consequences.

The potential for investors to disagree is particularly strong in the ESG context for several reasons. First, disagreement may arise due to heterogeneity in ESG funds' commitment to ESG in their asset allocations (Raghunandan and Rajgopal, 2022). In addition, as mentioned previously, there are mixed findings from prior research on the directional impact of firms' ESG performance on firm value, which may lead to differences in how ESG investors incorporate ESG indicators for value investing.[5] Moreover, the previously documented disagreement among ESG rating agencies about individual companies' ESG performance (e.g., Avramov et al., 2022; Berg et al., 2022; Chatterji et al., 2016; Christensen et al., 2022) demonstrates the high degree of subjectivity in assessing ESG performance, which may lead to differences in how ESG investors incorporate ESG indicators for values investing. Specifically, prior research attributes disagreement among ESG rating agencies to "different beliefs about what constitutes good ESG performance, different views

[5] Some studies document associations between ESG (or, equivalently, corporate social responsibility) and future financial performance that are positive, negative, insignificant, or U-shaped. There is similarly mixed evidence on the association between CSR performance and stock returns, with some studies documenting associations that are positive, negative, or insignificant. See Awaysheh et al. (2020), Lin et al. (2019), and Moser and Martin (2012) for reviews of studies on the link between ESG performance and firm value.

about the appropriate measures for assessing superior ESG performance (and) differences in weights placed on ESG indicators" (Kimbrough et al., 2024). ESG investors are likely to disagree on these same dimensions. Finally, ESG-focused asset managers may disagree due to the challenges they face in obtaining transparent, uniform, and quantifiable ESG data.[6]

2.2.2. ESG disclosure

Because disagreement among investors can increase the firm's cost of capital, managers have incentives to pursue ways to mitigate investor disagreement. Classic disclosure theory predicts that public information disclosure can reduce investor disagreement generally (Kim and Verrecchia, 1991)[7], raising disclosure as potential remedy for ESG investor disagreement. Since the disagreement among active mutual fund managers with an ESG focus is likely to be related specifically to ESG topics, firms' voluntary disclosures about these topics can potentially resolve disagreement among this large and increasingly influential class of investors.

There is growing recognition by influential members of the investment community of the need to provide ESG investors with convenient access to ESG metrics because they are not readily available in traditional financial reports. In 2019, NASDAQ encouraged and provided member firms with guidance on how to voluntarily report ESG information.[8] Larry Fink, CEO of Blackrock, has long stressed the importance of transparent ESG information in his annual letter to the companies in Blackrock's investment portfolios (GlobeScan, 2023).[9]

In response to these and similar calls, US companies are voluntarily issuing ESG reports

[6] PwC (2022, p.22) reports that "[n]early two-thirds of asset managers (64%) believe that data challenges are one of the main obstacles when adopting or considering ESG investments."
[7] Consistent with this prediction, prior research shows that various types of voluntary disclosure (e.g., annual report disclosures, management forecasts, earnings conference calls, R&D related disclosures, and political spending disclosures) mitigate disagreement among capital market participants by providing information that they can commonly rely on (Bowen et al., 2002; Goh et al., 2020; Hope, 2003; Jones, 2007; Kross and Suk, 2012; Lang and Lundholm, 1996).
[8] The full ESG reporting guide is accessible via https://www.nasdaq.com/ESG-Guide.
[9] For example, he stated in his 2018 CEO letter: "(A) company's ability to manage environmental, social, and governance matters demonstrates the leadership and good governance that is so essential to sustainable growth, which is why we are increasingly integrating these issues into our investment process."

more frequently.[10] Although the format and content of ESG reports vary, they typically consist of an array of non-financial metrics combined with management commentary organized around dimensions such as: environment, workplace, product safety, and community.[11] Prior research shows that nonfinancial measures such as customer satisfaction are value-relevant because they are leading indicators of future financial performance (Amir and Lev, 1996; Ittner and Larcker, 1998). Edmans (2023) argues that ESG indicators share this property with other previously examined non-financial indicators. NASDAQ echoed this point as support for its recommendation that listed firms voluntarily disclose ESG metrics.[12]

ESG reports reduce the cost of searching for and acquiring ESG indicators by making them readily accessible, which can resolve disagreements about individual firms' ESG performance and ESG-based sources of value that arise due to unequal access to ESG metrics resulting from heterogeneity in investors' ability to search for and acquire this information (Blankespoor et al., 2020). In addition, the commentary in ESG reports reduces the cost of integrating the ESG indicators into investment decisions by contextualizing the metrics, which can possibly resolve disagreements that arise due to differing interpretations of the metrics resulting from heterogeneity in investors' ability to integrate this information (Blankespoor et al., 2020). Therefore, we predict that ESG reports may reduce the disagreement among ESG investors – the intended audience.

However, the success of ESG reports in reducing disagreement among ESG investors depends on whether the reports provide a sufficient basis for common reliance and interpretation,

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[10] According to Governance & Accountability Institute (2021), 92% of S&P500 companies published sustainability reports in 2020, compared to only 20% in 2012.

[11] As part of its guidance to its member companies, NASDAQ provided numerous examples of ESG metrics to include in ESG reports. Examples of environmental metrics include: GHG Emissions, Emissions Intensity. Examples of social metrics include CEO Pay Ratio, Gender Pay Ratio, Gender Diversity, Injury Rates, Global Health and Safety. Examples of governance metrics include Board Diversity and Board Independence.

[12] "While ESG factors are at times called non-financial, how a company manages them undoubtedly has financial consequences. The very term non-financial is a controversial point of reference, because many believe that ESG information is no less relevant or useful to an investor in assessing the financial prospects and operational performance of a company than information channeled through traditional accounting practices." (NASDAQ, 2019)

which is not obvious. ESG investors have expressed concerns about the credibility of voluntary ESG reports issued by US firms because the (largely nonfinancial information) contained in them falls outside of traditional auditor and regulatory oversight (Chen et al., 2016).[13] Therefore, managers have substantial latitude to manipulate various dimensions of the reports strategically or opportunistically to enhance the firm's reputation through public relations or even greenwashing.[14]

Even if ESG reports are credible, some researchers raise the theoretical possibility that ESG disclosure can lead to divergent beliefs among investors who have different interpretations of the disclosed information (Harris and Raviv, 1993; Kandel and Pearson, 1995).[15] Specifically, Kim and Verrecchia (1994) show that public disclosure can promote further disagreement when agents have diverse priors. ESG investors are likely to have diverse priors due to divergent views about the directional impact of ESG performance on firm value and about the appropriate way to evaluate ESG performance, raising the possibility that ESG reports may not promote consensus among ESG investors. Heterogeneity in ESG funds' commitment to ESG in their asset allocations (Raghunandan and Rajgopal, 2022) may also contribute to diverse interpretations of ESG reports.

Taken together, whether voluntary ESG disclosure reduces disagreements among ESG investors is an empirical question. Thus, we test the following null hypothesis:

H1. The provision of voluntary ESG reports is not associated with the disagreement about ESG performance among ESG investors.

3. Research design and variable measurement

3.1. Measurement for dispersion in ESG investors' beliefs

[13] "More than half (56%) of institutional investors and 76% of asset managers are in favour of strengthening ESG disclosure rules for listed companies" (PwC, 2022, p.24).

[14] For related studies, please see the following papers: Habbitts and Gilbert (2007), Hobson and Kachelmeier (2005), Holder-Webb et al. (2009), Ramanna (2013), and Simnett et al. (2009). Highlighting these concerns, the Eugene Lang Entrepreneurship Center called on ESG investors to use their "power to shape corporate sustainability by demanding [and calling for] transparent, standardized and credible collection and reporting of ESG data."

[15] Cready (2007) and Kim and Verrecchia (1994) suggest that disclosure could lead to increased information asymmetry.

We adopt Jiang and Sun (2014)'s methodology for measuring the dispersion in beliefs among actively managed mutual funds to capture the dispersion in beliefs among actively managed ESG funds. This methodology measures the standard deviation of different funds' active holdings of each stock, where active holdings refer to the difference between the weight of a stock in each ESG fund and its weight in the fund's benchmark index. The intuition is that active fund managers start the portfolio construction from a benchmark index and then adjust the weights of each stock based on their own beliefs about the stock, over- (under-) weighting stocks they view more (less) favorably. Because ESG investors focus on ESG performance, we apply this methodology to ESG funds to capture dispersion in ESG investors' beliefs about the ESG performance of individual stocks. We use Morningstar Direct to identify ESG funds, with further details in Section 4.

Since the benchmark indices that each fund follows are not directly available, we build on the work of Cremers and Petajisto (2009) and Jiang and Sun (2014), and select the following benchmark indices that are commonly used by practitioners: the Standard & Poor's (S&P) 500, S&P 400, S&P 600.[16,17] To identify one benchmark index for each ESG fund in each quarter, we calculate the distances between the ESG fund portfolio weights and the portfolio weights of each benchmark index out of the 3 and designate the one with the lowest distance as the benchmark index for the focal ESG fund in a given year quarter. After selecting a benchmark index for each ESG fund, we construct the dispersion in beliefs for a particular stock at a year-quarter level as the

[16] Portfolio weights for ESG indices are not widely available. Moreover, our use of traditional indices as benchmarks rather than ESG-specific indices best reflects ESG investors' decision process. Recall that under the Pedersen et al. (2021) framework, ESG investors include ESG-Aware investors and ESG-Motivated investors. ESG-Aware investors have return maximization as their sole objective and use ESG information as an additional input to meet this goal. ESG-Motivated investors use ESG information to pursue both higher portfolio returns and higher ESG performance of their portfolios simultaneously. Both types of ESG investors seek the highest portfolio return they can achieve given their objectives, which requires that they start with the full unconstrained universe of stocks in their benchmark index before making their over- or under-weighting decisions rather than starting with a benchmark ESG index where constraints have already been applied.

[17] We choose S&P indices as benchmarks primarily to mimic the most common practice in the mutual fund industry and to obtain better matching between the funds and the indices. According to S&P Global, as of December 31, 2024, S&P 500, S&P 400, and S&P 600 collectively account for about 94% of the U.S. Equity Market with S&P 500 covering about 87% (S&P Global, 2025). And S&P 500 is the most popular index used by U.S. mutual funds for benchmarking purposes (Robertson, 2019).

standard deviation of the active holdings by all ESG funds that cover a particular stock as follows:

$$Dispersion\_ESG_{i,t} = \sqrt{\frac{1}{N_i - 1} \sum_{j=1}^{Ni} [\left(w_{i,t}^{j} - w_{i,t}^{b_j}\right) - \overline{\left(w_{i,t}^{j} - w_{i,t}^{b_j}\right)}]^2} \quad (1)$$

where $w_{i,t}^{j}$ is the weight of stock *i* in ESG fund *j*'s portfolio at the end of quarter *t*, $w_{i,t}^{b_j}$ is the weight of stock *i* in the benchmark index *b* of ESG fund *j*'s portfolio at the end of quarter *t*, and N_i is the number of ESG funds whose investment universe includes hold stock *i*. A stock enters an ESG fund's investment universe if it is held by the fund or is included in its benchmark index.[18]

3.2. Measurement for voluntary ESG disclosure

The independent variable of interest in our study is whether a firm provides any ESG reports during the year. To gather the information, we collect all U.S. listed firms' ESG reports from Corporate Register, a global leading data provider of actual ESG reports (in PDF format) and widely adopted by prior researchers (e.g., Clarkson et al., 2020; Dhaliwal et al., 2012). Although Corporate Register is a comprehensive database, we double-check the discrepancy between Corporate Register and Global Reporting Initiative (GRI) database and manually download additional ESG reports from company websites if available. Overall, our collection of ESG reports comes from these combined authoritative sources.

We first define ESG disclosure (*ESG_Disclosure*) as an indicator variable that equals one if a firm releases at least one ESG report within 365 days preceding the quarter, and zero otherwise. This measurement distinguishes between firms that provide some level of ESG disclosure and those that do not. However, it does not capture differences in ESG disclosure among companies that provide an ESG report, implicitly assuming that all ESG reports provide the same amount of

[18] Before calculating the standard deviations, we winsorize the difference between an ESG fund's weight and the weight of the same stock in the fund's benchmark index—that is, $(w_{i,t}^{j} - w_{i,t}^{b_j})$—at the 1st and 99th percentiles to reduce the impact of potential outliers on the dispersion measure.

information. However, not all ESG reports are created equally. Prior literature documents that lengthier voluntary disclosure contains more information and is thus more informative (Dyer et al., 2017; Li, 2008; Muslu et al., 2019). Specifically, Muslu et al. (2019) suggest that the length of ESG reports is positively associated with analyst forecast accuracy. Hence, we use report length as an alternative measure of ESG disclosure to capture more of the variation across ESG reports in the amount of information they contain. Our specific measure of report length is equal to the natural logarithm of the total number of words in raw ESG reports.[19] This continuous variable *ESG_Disclosure* equals the report length for ESG disclosers, and zero otherwise.

3.3. Test of the main hypothesis

We test the relation between the issuance of ESG reports and dispersion in ESG investors' beliefs by estimating the following OLS regression with the pooled sample.

$$\begin{aligned} Dispersion\_ESG_{i,t} = {} & \alpha_0 + \alpha_1 ESG\_Disclosure_{i,t} + \alpha_2 Ana\_Dis_{i,t} + \alpha_3 Ann\_Ret_{i,t} + \\ & \alpha_4 Beta_{i,t} + \alpha_5 BTM_{i,t} + \alpha_6 Firm\_Size_{i,t} + \alpha_7 Idi\_Vol_{i,t} + \\ & \alpha_8 Institute_{i,t} + \alpha_9 Loss_{i,t} + \alpha_{10} Mon\_Ret_{i,t} + \alpha_{11} RD_{i,t} + \\ & \alpha_{12} Turnover_{i,t} + \alpha_{13} Fund\_Yield_{i,t} + \alpha_{14} Fund\_Size_{i,t} + \\ & \alpha_{15} Num\_Fund_{i,t} + \varepsilon_{i,t} \end{aligned} \quad (2)$$

The coefficient of interest, α_1, is negative if ESG reports help reduce dispersion in ESG investors' beliefs. We control for the following determinants of dispersion in active mutual funds' beliefs identified in Jiang and Sun (2014): dispersion in analyst earnings forecasts ($Ana\_Dis_{i,t}$), annual stock returns ($Ann\_Ret_{i,t}$), book-to-market ratio ($BTM_{i,t}$), firm size ($Firm\_Size_{i,t}$), idiosyncratic volatility ($Idi\_Vol_{i,t}$), the stock return in the past month ($Mon\_Ret_{i,t}$), the number of ESG funds that hold stock *i* at quarter *t* ($Num\_Fund_{i,t}$), and turnover ratio ($Turnover_{i,t}$). In addition, we follow the literature on analyst dispersion (e.g., Liu and Natarajan, 2012) and include

[19] We also use alternative measures for the length of ESG reports, such as the text file size, the number of words in reports where stop words and punctuations are removed, and the number of sentences. Our results hold with all the alternative proxies.

the following additional controls: Beta ($Beta_{i,t}$), the percentage of institutional ownership ($Institute_{i,t}$), an indicator of a net loss ($Loss_{i,t}$), and an indicator of reporting research and development expenses ($RD_{i,t}$). Finally, we also control for fund-related characteristics: the average total net assets ($Fund\_Size_{i,t}$) and the average returns of all ESG funds that hold stock *i* at quarter *t* ($Fund\_Yield_{i,t}$) (Chen et al., 2022). See Appendix A for detailed variable definitions. We include industry, year, and quarter fixed effects to capture industry-invariant and time-invariant factors that may be related to the dispersion in investors' beliefs. To address the effect of within-firm correlations of the residuals, we cluster the standard errors at the firm level. We also winsorize all the continuous variables at their 1st and 99th percentiles to reduce the impact of potential outliers.

4. Sample selection and data description

Our data collection starts from a list of U.S. funds that are identified as general ESG investment by Morningstar Direct (Dantas, 2021; Dikolli et al., 2022). The classification of ESG funds is based on funds' self-reported ESG status (obtained from the information contained in sources such as fund prospectuses and fund websites).[20] We obtain a list of 1,039 ESG funds from Morningstar Direct in August 2022.[21] Then we collect the portfolio holdings from CRSP Survivor-Bias-Free US Mutual Fund Database and merge the holdings dataset with the Morningstar Direct ESG funds through fund tickers.[22] As in prior finance literature on mutual funds (e.g., Elton et al., 2011), we remove pure index funds to focus on actively managed funds. Regarding the historical holdings of benchmark indices, we collect the information for all S&P indices from Refinitiv (DataStream).

[20] Morningstar does not verify the qualification of ESG labels by examining the funds' holdings (Raghunandan and Rajgopal, 2022).
[21] Similar to prior studies (e.g., Dikolli et al., 2022; Raghunandan and Rajgopal, 2022), we use the 2022 ESG fund list to construct our full sample. One implicit assumption is that the designation of each fund tends to be stable over time, and it is unlikely for a fund to change their investment objective during our sample period (from 2006 to 2021).
[22] Morningstar also provides the historical underlying holdings of each fund. However, it is quite labor-demanding to download the holdings for a large set of funds for a long time period. We randomly select a number of ESG funds and manually compare the holdings of these funds from Morningstar Direct with those from CRSP. The two databases contain consistent holdings information.

We obtain firm-related financial information from Compustat, stock return data from CRSP, analyst forecasts from I/B/E/S, fund information from CRSP mutual fund database, and institutional ownership from Thomson Refinitiv. After obtaining the full dataset, we remove firms in the utility and financial industries as these industries are highly regulated and inherently different from other industries, similar to previous studies (Acharya et al., 2007; Huang et al., 2021; Machokoto et al., 2021). We also remove observations with fewer than three funds investing in the focal stock. With all the necessary information available, our final sample for the main test consists of 1,688 unique firms with 20,493 firm-quarter observations from 2006 to 2022.[23] Table 1 describes the sample selection and filtering processes in detail.

[Insert Table 1 here]

We present descriptive statistics for the major variables used in our tests in Table 2. On average, 32% of our observations come with ESG disclosure. *Dispersion* among ESG investors' beliefs ranges from 0.012 to 1.204, indicating a substantial variation in ESG investor disagreement. Stock return variables (such as *Mon_Ret* and *Ann_Ret*) range from negative to positive values. The distribution of *Firm_Size* also shows that we cover various types of firms in the sample. Overall, our sample is representative of a comprehensive set of US listed firms. Each stock in each quarter is on average held by seven unique ESG funds (i.e., the mean of *Num_Fund* is 2.076).[24] The percentage of institutional ownership (*Institute*) is 84% on average, consistent with the fact that most companies are held by institutional investors.

[Insert Table 2 here]

5. Empirical results

[23] The sample period starts from 2006 when there is enough holdings information available from CRSP and other data required for the study. The sample ends in early 2022 when the latest ESG reports, and other financial information are publicly available.

[24] As *Num_Fund* is the natural logarithm of the number of ESG funds that hold a firm plus 1, the mean of the number of ESG funds is exp(2.076)-1.

5.1. Results for the main hypothesis test

Table 3 presents the results of estimating regression model (2) on the sample of ESG investors. We estimate the model with both measures of *ESG_Disclosure*: an indicator variable corresponding to the existence of an ESG report in the past year, and a continuous variable that equals the length of ESG reports for ESG disclosers, and zero otherwise. For both measures of *ESG_Disclosure*, the coefficient on *ESG_Disclosure* is significantly negative ($p < 0.05$), meaning that dispersion in ESG investors' beliefs decreases for firms providing (lengthier) ESG disclosures.

In addition, the coefficients on control variables in the main test are mostly aligned with those in prior studies. For instance, the dispersion in ESG fund active holdings is lower for firms with higher book to market ratio, lower annual stock return, and higher idiosyncratic volatility, consistent with Jiang and Sun (2014). However, the sign of firm size is positive in our study (i.e., the dispersion among ESG funds is higher for larger firms while larger firms tend to experience lower dispersion among all mutual funds in Jiang and Sun (2014). A possible explanation is that larger stocks are subject to higher disagreement about their ESG performance because ESG funds devote more of their active management to assessing the ESG performance of larger stocks. In addition, we document that larger and better-performing ESG funds tend to have lower disagreement with commonly held stocks.

[Insert Table 3 here]

5.2. BlackRock's "Dear CEO" letters—an identification strategy to strengthen causal inference for the main hypothesis

A potential concern in our sample is the self-selection issue associated with the voluntary nature of firms' issuance of ESG reports. Firms that choose to issue ESG reports may be inherently different from those that do not, which may contribute to a negative association between ESG disclosure and disagreement among ESG investors. To alleviate the self-selection concern in firms' choice to issue standalone ESG reports, we exploit an exogeneous shock to the pressure the focal firms face to provide ESG reports, i.e., "Black Rock's Dear CEO Letters".

Beginning in 2012, BlackRock, the world's largest asset manager, started issuing "Dear CEO" letters, which are publicly available on its official website but are directed towards firms within BlackRock's portfolios. Initially, the focus of these letters was corporate governance and long-termism, but since 2018, they have shifted towards purposeful business with an emphasis on external stakeholders concerning social and environmental issues (GlobeScan, 2023).[25] Pawliczek et al. (2021) investigate the impact of BlackRock's "Dear CEO" letters on its portfolio firms' disclosure behavior. They find that post-letter disclosures from portfolio firms contain topics more similar to those discussed in the letters. Therefore, we infer that BlackRock's portfolio firms are more inclined to provide ESG reports after BlackRock highlights ESG-related topics in its letters.

Empirically, we use BlackRock's 2018 "Dear CEO" letter as an exogenous source of pressure on firms held by BlackRock's ESG funds to issue ESG reports, as 2018 marks the first year of a significant call to meet the interests of external stakeholders and society at large. We define treated observations as those without ESG reporting from 2015 to 2017, issuing ESG reports in 2018 or 2019, and held by BlackRock's ESG funds for two consecutive quarters both before and after the release of the 2018 "Dear CEO" letter. The control group comprises firms with no ESG reports since 2015 and throughout the post-event periods and not held by any of BlackRock's ESG funds for two consecutive quarters both before and after the 2018 "Dear CEO" letter's release. In this specification, treated firms are subject to pressure from BlackRock, while control firms do not have ESG reports and are not subject to such pressure. We adopt the regression model below:

$$Dispersion\_ESG_{i,t} = \alpha_0 + \alpha_1 Treat * Post_{i,t} + \alpha_2 Treat_{i,t} + \sum Controls + \varepsilon_{i,t} \qquad (3)$$ [26]

[25] The full report is accessible via https://globescan.com/2023/03/30/analysis-larry-finks-annual-letter-ceos-2023/.
[26] The year-specific *Post* variable is absorbed by year fixed effects and is therefore omitted from Equation (3).

Table 4 presents the empirical results. In panel A, the coefficient on the interaction term (*Treat*Post*) is significantly negative (p < 0.01), meaning that the treated firms experience a decrease in ESG investor disagreement after the shock. Additionally, we assess if the parallel trend assumption is likely to be violated through regressing the outcome variable on time indicators (i.e., three quarters before and after the event). In panel B, the coefficients of pre-event indicators are not significant, suggesting there is no evidence of a pre-trend.

[Insert Table 4 here]

6. Cross-sectional variation tests

Our main results demonstrate that ESG disclosure resolves ESG investor disagreement. We next examine sources of cross-sectional variation in the impact of ESG reports on such disagreement. We build on Kim and Verrecchia (1991)'s theoretical framework, which models the impact of a disclosure as a function first and foremost of the amount of information it contains. The impact of the information is moderated by its precision with more precise information eliciting stronger market impacts (investor responses). This framework is the implicit basis for most studies that empirically examine the impact of disclosures.[27] To apply this in our context, we use the continuous measure of *ESG_Disclosure* (i.e., the report length) to proxy for the (likely) amount of new information rather than assuming that all reports contain the same amount of information. We then interact this measure with various measures that potentially contribute to the perceived precision of the information in the reports. Specifically, we examine the impacts of variables that correspond to the accessibility (i.e., the clarity and interpretability) of the information in the reports, to the reports' credibility-enhancing features, and to their specific topical contents.

[27] For example, in the management forecast literature, the management forecast surprise represents new information. The surprise is then interacted with various factors that can be broadly characterized as representing the precision of the surprise such as the range and credibility of the forecast (Hirst et al., 2008; Mercer, 2004).

6.1. Moderator: the accessibility of ESG reports

In this section, we explore the moderation effect of the accessibility of an ESG report using the continuous measure of *ESG_Disclosure*. We use two proxies for report accessibility: report readability and the number of images. First, readability is how easily a reader can understand a written text, and Fog index is a widely used measure of readability in the accounting and finance literatures (Guay et al., 2016; Li, 2008).[28] A higher Fog index refers to lower readability and thus lower accessibility of the ESG reports. Hence, we expect the Fog index to accentuate the impact of ESG disclosure. Second, prior studies show that images contain richer information than text alone and are used to enhance stakeholder perception of ESG performance (e.g., Cho et al., 2009; Invernizzi et al., 2022).[29] Therefore, we predict that the use of images in ESG reports can improve accessibility and help ESG investors better understand and analyze these reports, thus leading to lower dispersion. The regression models are as follows:

$$Dispersion\_ESG_{i,t} = \alpha_0 + \alpha_1 ESG\_Disclosure\_Fog_{i,t} + \alpha_2 ESG\_Disclosure_{i,t} + \alpha_3 Fog_{i,t} + \sum Controls + \varepsilon_{i,t} \quad (4)$$

$$Dispersion\_ESG_{i,t} = \alpha_0 + \alpha_1 ESG\_Disclosure\_Image_{i,t} + \alpha_2 ESG\_Disclosure_{i,t} + \alpha_3 Image_{i,t} + \sum Controls + \varepsilon_{i,t} \quad (5)$$

$Fog_{i,t}$ is an indicator variable that equals one if the Fog index of the focal ESG report is equal to or greater than 14, and zero otherwise.[30] $Image_{i,t}$ is an indicator variable that equals one if the number of images used in the focal ESG report is at or above the industry-year median level, and zero otherwise. The number of images in ESG reports is automatically generated using a widely-

[28] Du and Yu (2021) further document that ESG reports convey more value relevant information to the market and better indicate firms' future ESG performance when the ESG reports are more readable (using the Fog index).

[29] For instance, Invernizzi et al. (2022) use content analysis and experiments to investigate the impact of the visual characteristics (i.e., number of images) of ESG reports on investors' perceptions. Drawing on theories of processing fluency and legitimacy, they find that using a moderate number of images in ESG reports increases the processing fluency of investors and decreases their perception of hypocrisy, leading to higher levels of organizational legitimacy.

[30] The reading level corresponding to a Fog index value of 14 is equivalent to that of a college sophomore. Our findings remain consistent when considering higher Fog index values, such as 15 and 16, as the cutoff. More details on the reading levels corresponding each Fog index can be found at https://en.wikipedia.org/wiki/Gunning_fog_index.

used user-written Python package—Fitz. We include all control variables that are in model (2). The coefficient of interest is α_1 in models (4) and (5). The interaction terms $ESG\_Disclosure\_Fog_{i,t}$ and $ESG\_Disclosure\_Image_{i,t}$ represent the interaction between ESG reports (*ESG_Disclosure*) and their accessibility (*Fog or Image*). A positive (negative) α_1 when accessibility is measured as *Fog* (*Image*) indicates that the association between ESG disclosures and the dispersion in ESG investors' beliefs is stronger for more accessible reports.

Table 5 presents the empirical results. The coefficient on *ESG_Disclosure_Fog* in Panel A is significantly positive ($p < 0.05$). The coefficient on *ESG_Disclosure_Image* in Panel B is significantly negative ($p < 0.01$). Both results are consistent with our expectation that greater readability and inclusion of more images enhance the usefulness of the information contained in the ESG reports.

[Insert Table 5 here]

6.2. Moderator: the credibility of ESG reports

In addition to their accessibility, the credibility of ESG reports may also play an important role in how ESG investors utilize them. Theoretically, ESG investors are likely to rely more heavily on more credible reports (Mercer, 2004). We adopt three measures of credibility. The first is whether an ESG report is verified by an external assurance provider. There are various types of assurance providers, such as accounting, engineering, or consulting firms. Compared with non-accounting firms, accounting firms are unique in that their expertise covers both traditional auditing and non-financial reporting assurance (Kimbrough et al., 2024). They provide superior assurance services that translate into increased market valuation (Peters and Romi, 2015), lower cost of capital (Casey and Grenier, 2015), and better going-concern risk assessments (Maso et al., 2020). Hence, the assurance service provided by accounting firms should help improve the usefulness and credibility of ESG reports and thus may further reduce the dispersion among ESG investors. The second proxy for credibility is the number of external hyperlinks to other authoritative sources inserted into ESG reports. Through these hyperlinks, readers are guided to alternative sources, such as verification websites, financial media outlets, and research papers, to either verify the information contained in the current reports or obtain more comprehensive information. Thus, external hyperlinks potentially increase the credibility of ESG reports to ESG investors (Cerbone and Maroun, 2020; Jean, 2024; Martin, 2019). The third measure of credibility is the tone of ESG reports. Luo et al. (2025) document a strong positive relationship between the optimistic tone of ESG disclosures and the divergence in ESG ratings. They conclude that rating agencies may view positive tone as a strategic attempt by firms to mask underlying problems, thereby triggering skepticism about the reports' credibility and contributing to greater discrepancies in the resulting ratings. This argument suggests that less positive or more neutral tones potentially enhance the credibility of ESG reports to ESG investors. Empirically, we test the following regression models:

$$Dispersion\_ESG_{i,t} = \alpha_0 + \alpha_1 ESG\_Disclosure\_AcctAssu_{i,t} + \alpha_2 ESG\_Disclosure_{i,t} + \alpha_3 AcctAssu_{i,t} + \sum Controls + \varepsilon_{i,t} \quad (6)$$

$$Dispersion\_ESG_{i,t} = \alpha_0 + \alpha_1 ESG\_Disclosure\_Link_{i,t} + \alpha_2 ESG\_Disclosure_{i,t} + \alpha_3 Link_{i,t} + \sum Controls + \varepsilon_{i,t} \quad (7)$$

$$Dispersion\_ESG_{i,t} = \alpha_0 + \alpha_1 ESG\_Disclosure\_Pos\ (or\ Neg, Neu)_{i,t} + \alpha_2 ESG\_Disclosure_{i,t} + \alpha_3 Pos(or\ Neg, Neu)_{i,t} + \sum Controls + \varepsilon_{i,t} \quad (8)$$

$AcctAssu_{i,t}$ equals one if the ESG report for firm *i* in quarter *t* is verified by an accounting firm, and zero otherwise. To identify the number of referenced hyperlinks appearing in an ESG report, we rely on the ready-to-use Python package "PyMuPDF" to automatically identify external links in the original PDF files. $Link_{i,t}$ is set to one if the total number of links directing readers to external (i.e. not company's internal) verification, financial media and research websites in firm

i's ESG report in the year to which quarter t belongs is at or above the median industry-year level, and zero otherwise. To classify the tone of ESG reports, we use FinBERT-tone model, a state-of-the-art large language model developed by Huang et al. (2023) for financial tone analysis. Specifically, the model labels each sentence's tone as positive, negative, or neutral.[31] $Pos(or\ Neg, Neu)_{i,t}$ is set to 1 if the percentage of positive (or negative, neutral sentences)—relative to the total number of sentences in firm i's ESG report in the year to which quarter t belongs—is at or above the median industry-year level. The coefficient of interest is α_1 in models (6), (7), and (8). The interaction terms $ESG\_Disclosure\_AccAssu_{i,t}$, $ESG\_Disclosure\_Link_{i,t}$, and $ESG\_Disclosure\_Pos(or\ Neg, Neu)_{i,t}$ represent the interaction between ESG reports ($ESG\_Disclosure$) and their credibility ($AcctAssu$, $Link$, or $Pos(or\ Neg, Neu)$). A negative α_1 suggests that ESG report credibility strengthens the impact of $ESG\_Disclosure$ on dispersion.

Table 6 presents the test results. Panels A, B, and C present the results for $AcctAssu$, $Link$, and $Pos\ (or\ Neg, Neu)$ respectively. In panel A and B, we observe a negative coefficient for both interaction terms ($p < 0.10$ and $p < 0.01$), supporting our prediction that the dispersion in ESG investors' beliefs is lower for companies issuing ESG reports assured by accounting firms or containing more external links. In panel C, the coefficients of the $ESG\_Disclosure\_Neg$ and $ESG\_Disclosure\_Neu$ are significantly negative ($p < 0.05$), suggesting that negative or neutral content in ESG reports is particularly effective in reducing disagreement among ESG investors, consistent with our predictions.

[Insert Table 6 here]

6.3. The E, S, G topical content of ESG reports

To this point, we have considered the overall impact of environmental (E), social (S), and

[31] The coding example can be found via https://huggingface.co/yiyanghkust/finbert-tone.

Governance (*G*) discussions in ESG reports. However, these topics cover a wide range of diverse issues that may vary in importance to ESG investors. Therefore, in this section, we further differentiate between discussions in ESG reports devoted to *E*, *S*, and *G* topics. To provide evidence on whether the individual topics vary in importance to investors, we estimate the following regression model:

$$Dispersion\_ESG_{i,t} = \alpha_0 + \alpha_1 ESG\_Disclosure\_ESG(or\ E,S,G)_{i,t} + \alpha_2 ESG\_Disclosure_{i,t} + \alpha_3 ESG(or\ E,S,G)_{i,t} + \sum Controls + \varepsilon_{i,t} \quad (9)$$

We first identify the number of environmental (*E*), social (*S*), or governance (*G*)-related sentences in each report using FinBERT-esg-9-categories model, a state-of-the-art large language model fine-tuned on companies' ESG and annual reports (Huang et al., 2023).[32] $ESG(or\ E,S,G)_{i,t}$ takes one if the total number of *E*, *S*, or *G*-related sentences (for *ESG*) or the number of *E*, *S*, or *G* sentences individually is at or above than the median industry-year level, and zero otherwise. α_1 in model (9) is the coefficient on the interaction term between the length of an ESG report (i.e., the continuous measurement of *ESG_Disclosure*) and the indicator variable for the corresponding content. A negative α_1 suggests the corresponding type of content is particularly useful for ESG investors conditional on the overall information content of ESG reports.

We present the results in Table 7. In column (1), coefficient α_1 is significantly negative for combined ESG content ($p < 0.05$), indicating that disclosure on ESG-related content in general reduces ESG investors' disagreement. Column (2) - column (4) show that coefficient α_1 is significantly negative for the individual environment and social-related categories ($p < 0.01$ and $p < 0.05$, respectively), suggesting these topics drive the overall effect. The results indicate that ESG investors care about the climate-related issues that the international community and several states

[32] The coding example can be found via https://huggingface.co/yiyanghkust/finbert-esg-9-categories.

such as California and New York have included into their legislative and policy agendas.[33] In addition, the results are consistent with practitioner claims that ESG investors consider information about workplace and community practices to be important for building sustainable and resilient portfolios (Iggo, 2022; PRI, 2017). Overall, the findings demonstrate that ESG investors consider a wide spectrum of ESG topics to be value- and values-relevant.

[Insert Table 7 here]

7. Additional tests

7.1. Path analysis

As ESG reports are not the only source for ESG fund managers to gather ESG-related information, we explore ESG rating agencies as potential mediators for the main result. With the rising importance of companies' ESG performance, ESG rating agencies represent a growing type of information intermediary that evaluates ESG performance by analyzing ESG reports, undertaking independent investigations, or directly communicating with companies (Scalet and Kelly, 2010). Institutional investors consume financial analysts' reports for their investment decisions. Similarly, ESG investors may also utilize the ESG ratings produced by professional agencies to allocate their investments among different stocks. Following this line of reasoning, we expect a lower dispersion among ESG investors' beliefs when ESG rating agencies have more consistent views; that is, dispersion in ESG ratings is lower. On the other hand, Kimbrough et al. (2024) document that the release of ESG reports can resolve the disagreement among ESG raters. Hence, we investigate whether the association between ESG disclosure and the dispersion in ESG investors' beliefs is mediated by the impact of ESG reports on dispersion in ESG ratings.

[33] Examples include: The Paris Agreement, IFRS S1 and S2 (Climate-related Disclosures), California Climate Accountability Acts SB 261 and SB 253, and New York State's Climate Leadership and Community Protection Act and Climate Change Superfund Act.

Following Kimbrough et al. (2024), we construct the dispersion in ESG ratings for each firm-year by taking the standard deviation of the percentile ranks of ESG ratings from MSCI KLD, S&P Global, and Viego Eiris (three well-known ESG rating agencies) in a given year.

Table 8 presents the results of our mediation test.[34] Consistent with Kimbrough et al. (2024), we find a significantly negative relation between ESG disclosure and dispersion in ESG ratings ($p < 0.01$). Dispersion in ESG investors' beliefs is not significantly associated with dispersion in ESG ratings. The mediation effect (i.e., the indirect effect denoted in the table) is not significant either. Both the direct and total effect of ESG disclosure on dispersion in ESG investors' beliefs are significantly negative ($p < 0.05$), with the direct effect accounting for 98.3% of the total effect. Overall, our finding suggests that the primary impact of ESG disclosure on ESG investor disagreement is not mediated by the separate impact of ESG disclosure on dispersion in ESG ratings, highlighting ESG investors' independent use of ESG reports.

[Insert Table 8 here]

7.2. Broader impact of ESG reports

Our evidence thus far establishes the usefulness of ESG reports in resolving disagreement among ESG investors, who represent the target audience. The reports could have a similar impact on broader audiences because all value investors could potentially use the non-financial information they contain for fundamental analysis (Edmans, 2023). Dhaliwal et al. (2011) and Dhaliwal et al. (2012) show that provision of these reports leads to a reduction in cost of capital and an increase in analyst forecast accuracy. They attribute these capital market benefits to the fact that ESG reports are repositories of non-financial measures that facilitate traditional valuation. However, because they do not separately examine ESG investors, it remains an open

[34] The mediation test results presented in Table 8 are based on the binary (indicator) measure of *ESG_Disclosure*. We also perform the analysis using the continuous measure of *ESG_Disclosure*, and the untabulated result are similar.

question whether the ESG reports have different impacts on disagreements among different classes of investors. This possibility depends on whether there are differences among investors in the demand for and uses of ESG reports.

Pedersen et al. (2021) provide a framework for classifying investors into three groups based on their ESG approach: ESG-Unaware prioritize investment returns without using ESG data, ESG-Aware integrate ESG information into their analysis to enhance returns, and ESG-Motivated explicitly use ESG performance as investment criteria, aiming for high returns alongside positive ESG impact − similar to *values* investing in Starks (2023). Whether ESG reports have a differential impact among different investor groups depends on the empirical distribution of the three theoretical classes.

Using the ESG-Aware group as the baseline, there will be no differences in impact if both ESG and non-ESG investors consist entirely of investors in the Aware group. This possibility aligns with Edmans (2023)'s argument that there is no meaningful distinction between ESG and non-ESG investors because ESG is simply a label for non-financial information that all classes of investors use, consistent with the arguments in Dhaliwal et al. (2011) and Dhaliwal et al. (2012). If Edmans (2023)'s argument is true, then ESG reports should have a similar impact on investors designated as ESG and those designated as non-ESG. There will be meaningful distinctions between the two groups of investors if non-ESG investors include a non-trivial number of ESG-Unaware investors and/or if ESG investors include a non-trivial number of ESG-Motivated investors. Both cases imply more intense use of ESG information by ESG investors either to pursue value investing or values investing. Although the existence of ESG-Unaware and ESG-Motivated investors is theoretically possible, their actual existence is an empirical question.

We define non-ESG funds as all mutual funds in CRSP Survivor-Bias-Free US Mutual Fund Database except ESG funds used in our sample. We construct dispersion among non-ESG funds using the same methodology we employ to estimate dispersion in excess portfolio holdings among ESG funds to the non-ESG funds we identify.

Table 9 panel A reports the results of separate estimations of model (2) for ESG vs. non-ESG investors for firms with non-missing dispersion among both ESG and non-ESG investors. As previously reported in Table 3, *ESG_Disclosure* is significantly negative (p < 0.05) for both measures for ESG investors, implying that ESG disclosures aid ESG investors in reaching consensus investment allocation decisions. For non-ESG investors, the coefficient on *ESG_Disclosure* is significantly negative (p < 0.10) for the indicator measure of *ESG_Disclosure*, indicating that the benefits of ESG-related disclosure extend to traditional investors.

[Insert Table 9 here]

To determine whether ESG-related disclosure offers similar benefits to ESG and non-ESG investors, we run a stacked regression to examine if the impact of ESG and non-ESG investors is significantly different. Panel B presents this regression result. The interaction term between the indicator (continuous) variable of *ESG_Disclosure* and the group indicator *ESG_Group_Indicator* is statistically significant at p < 0.05 (p < 0.01), implying that ESG disclosures are more relevant for ESG investors than non-ESG investors in investment allocation decisions.

Overall, the results indicate that ESG reports assist both ESG and non-ESG investors in establishing more congruent evaluations of a company. However, the results indicate that ESG reports have a much more dramatic impact in resolving disagreement among ESG investors than among non-ESG investors. This dramatic difference in the impact of ESG reports on the two classes of investors runs counter to claims by Edmans (2023) and others that there is no practical difference between the approaches of ESG and non-ESG investors.

8. Robustness checks of the main hypothesis

8.1. Within-firm analysis of the first-time ESG issuance

To better account for firm-specific factors that remain consistent over time, we conduct a within-firm analysis of first-time ESG issuers. This involves comparing the *Dispersion* between the post-ESG issuance periods and the pre-ESG issuance periods of the same firms. Specifically, we first identify firm-year-quarter observations with the first-time ESG reporting and keep the eight quarters before and after the initial issuance. With this subset of the sample, we construct a variable "Post" that equals one if the observations belong to the post-issuance periods, and zero otherwise. The regression model is as follows:

$$Dispersion\_ESG_{i,t} = \alpha_0 + \alpha_1 Post_{i,t} + \sum Controls + \varepsilon_{i,t} \quad (10)$$

Model (10) includes all control variables included in model (2). Table 10 presents the results of estimating model (10). The coefficient on *Post* is significantly negative ($p < 0.05$), indicating a decline in ESG investors' disagreement subsequent to companies issuing their first ESG reports. The within-firm analysis further supports the reliability of our main findings that ESG disclosures promote consensus among ESG investors.

[Insert Table 10 here]

8.2. Apply a first differencing model

One might argue that ESG reporting is sticky over time. Therefore, it is important to investigate whether the changes in ESG reporting correlate with larger changes in Dispersion. We employ a first differencing model to address this concern, which also helps account for the problem of potentially omitted variables.

$$
\begin{aligned}
d.Dispersion_{i,t} \\
&= \alpha_0 + \alpha_1 d.ESG\_Disclosure_{i,t} + \alpha_2 d.Ana\_Dis_{i,t} + \alpha_3 d.Ann\_Ret_{i,t} \\
&+ \alpha_4 d.Beta_{i,t} + \alpha_5 d.BTM_{i,t} + \alpha_6 d.Firm\_Size_{i,t} + \alpha_7 d.Idi\_Vol_{i,t} \\
&+ \alpha_8 d.Institute_{i,t} + \alpha_9 d.Loss_{i,t} + \alpha_{10} d.Mon\_Ret_{i,t} + \alpha_{11} d.RD_{i,t} \\
&+ \alpha_{12} d.Turnover_{i,t} + \alpha_{13} d.Fund\_Yield_{i,t} + \alpha_{14} d.Fund\_Size_{i,t} \\
&+ \alpha_{15} d.Num\_Fund_{i,t} + \varepsilon_{i,t} \qquad (11)
\end{aligned}
$$

Model (11) is similar to model (2) but takes the first difference of all variables. The independent variable of interest, *ESG_Disclosure*, is the indicator or continuous measure that captures the issuance or length of ESG reports. Table 11 displays the result of estimating model (11). We observe a greater reduction in disagreement among ESG investors when there are incremental changes in ESG reporting behavior. The results from this first-differencing model, along with the main result shown in Table 3, support that ESG disclosures play a role in fostering consensus among ESG investors regarding the valuation of companies.

[Insert Table 11 here]

8.3. Entropy balanced sample

We apply a multivariate matching approach to equalize the distribution of determinants across the treatment and control groups. Specifically, we select the entropy balancing method as (1) it assigns continuous weights to each observation in the control group so that the loss of observations is not as severe as in other matching approaches such as propensity score matching; and (2) researchers do not need to make discretionary judgments on which observation to keep (Hainmueller, 2012; McMullin and Schonberger, 2020). To maximize the similarity between the control and treatment groups, we require the covariate distributions of control variables that appear in our main analysis in the reweighted sample to satisfy the first moment conditions (i.e., means). To address the pitfall of entropy balancing, i.e., assigning extremely large weights to certain observations, we follow McMullin and Schonberger (2022) to trim observations using estimated propensity scores before running entropy balancing.[35] We estimate model (2) for ESG investors, using the reweighted sample. The results in Table 12 are similar to those for our main specification in Table 3. The coefficient on *ESG_Disclosure* is significantly negative ($p < 0.01$). By balancing observable characteristics between the treated and control groups, the entropy balanced results bolster the causal inference of ESG disclosure on dispersion reduction among ESG investors.

[Insert Table 12 here]

8.4. Other robustness checks

As an alternative measure of the dispersion in ESG funds' excess holdings for a given stock, we use the interquartile range of ESG funds' excess holdings of the stock, consistent with the construction of dispersion in corporate bond valuation proposed by Cici et al. (2011). The untabulated results are qualitatively similar to the main results in Table 3 where the dispersion variable is based on the standard deviation of excess holdings. In addition, we use alternative time intervals to measure the independent variable (*ESG_Disclosure*). Specifically, we require that at least one ESG report was issued more than one but less than 365 days before the quarter-end. In doing so, we ensure that ESG funds have enough time to process ESG reports that are not outdated. The results (untabulated) based on different time intervals are similar to those in Table 3.

In Section 7.1, we consider dispersion in ESG performance ratings as a mediator. As a robustness check, we include it as an additional control in model (2). Also, to control for the normal level of disagreement in a stock, we include dispersion in non-ESG investors' beliefs in model (2). The untabulated results from adding both variables as alternative controls remain the same as the results presented in Table 3. The results also hold if we remove *Fund_Yield* and *Fund_Size*, which

[35] We follow Sturmer et al. (2010) to set the p-score cutoffs corresponding to the 10th and 90th percentiles of the p-score distributions in the discloser and non-discloser groups, and trim observations from both groups to achieve better common support.

are the two variables that capture fund characteristics and are not controlled for by Jiang and Sun (2014) or in papers examining analyst dispersion.

In addition to the identification test described in Section 5, we re-perform our main test using Heckman's two-stage selection model. Specifically, in the first stage, we estimate a probit model in which we regress *ESG_Disclosure* on a set of firm characteristics identified by prior literature. Then we add the inverse Mills ratio generated from the first-stage test when estimating model (2). For brevity, the untabulated result aligns with our main test, which indicates that ESG disclosure is associated with a reduction in ESG investors' belief dispersion, even after considering the likelihood of ESG disclosure.

9. Conclusion

This study examines the effect of voluntary ESG disclosure on resolving dispersion in ESG investors' beliefs. We find that disagreement among ESG investors is significantly negatively related to ESG disclosure. We conduct diff-in-diffs analyses around Blackrock's 2018 Dear CEO letter, which was an exogenous shock to the pressure on managers to issue ESG reports. We find that disagreement among ESG investors declines for firms that initiated ESG reports in response to the shocks, relative to control firms unaffected by the shocks, strengthening causal inferences.

Furthermore, we analyze actual ESG reports to explore the effects of their features on disagreement among ESG investors. The effect of ESG disclosure is stronger when the reports are more accessible and credible. Related to topic coverage, we find that disclosures on environmental and social matters enhance the overall effect of ESG disclosure on investor disagreement. In additional analyses, we first investigate ESG rating dispersion as a potential mediator for the main effect. The results from a path analysis suggest that ESG disclosure has a strong direct effect on ESG investor disagreement, and that the impact is not mediated by disagreement among ESG rating agencies. Next, we find that ESG disclosure is associated with a significant reduction in the average disagreement among ESG, and a less significant reduction among non-ESG investors. Our results hold under a battery of robustness tests.

Our study provides the first evidence that ESG reports are beneficial to their intended users – ESG investors. Moreover, our evidence that ESG reports have a greater impact on disagreement among ESG investors than among non-ESG investors indicates that there are meaningful distinctions between the two classes of investors, consistent with the theoretical frameworks proposed by Pedersen et al. (2021) and Starks (2023). This finding also provides a new perspective on prior findings that ESG reports are associated with reduced cost of capital, suggesting that this finding may be largely attributable to ESG investors and highlighting the benefits of catering to this investor class through tailored disclosures.

Our findings have practical insights for managers and policymakers. Managers can use the results of our in-depth content analysis to identify specific ESG reporting choices they can make to reduce costly disagreements among ESG investors. Policymakers and legislators, particularly at the state and international levels, will be interested in our finding that the coverage of environmental and social-related categories in ESG reports contributes to the overall impact of ESG reports on ESG investor disagreement.

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Appendix A Variable Definition

Variable	Definition	Source
Main Variables		
Dispersion	The standard deviation of ESG funds' active holdings relative to the benchmark indices for each firm at each quarter	Morningstar Direct, CRSP
ESG_Disclosure	An indicator variable that equals 1 if a firm discloses an ESG report at least one day before the quarter end date but not longer than 365 days before the quarter end date, and 0 otherwise. Or, a continuous variable that equals the natural logarithm of one plus the total number of words in original ESG reports issued at least one day before the quarter end date but not longer than 365 days before the quarter end date, and 0 if the firm issued no ESG report during this time frame.	CorporateRegister.com and company websites
Firm_Size	The natural logarithm of market value at the quarter end	Compustat
BTM	Book to market ratio, calculated as the natural logarithm of the ratio of the book value of equity to the market value of equity at the quarter end	Compustat
Mon_Ret	The stock return in the current month	CRSP
Ann_Ret	Annual firm stock return, calculated as the geometric mean of the firm's monthly stock return	CRSP
Idi_Vol	The idiosyncratic volatility measured as the standard deviation of the residual from a time-series regression of a stock's daily returns on the Fama and French (1993) factors	WRDS-Beta Suite
Turnover	The trading volume divided by the number of shares outstanding	CRSP
Num_Fund	The natural logarithm of one plus the number of ESG funds that hold a firm	Morningstar Direct
Ana_Dis	Analyst dispersion, calculated as the standard deviation of analyst annual earnings forecasts divided by the mean forecast	IBES
Beta	Coefficient on MKT based on Fama-French 3 factors model	WRDS-Beta Suite
Loss	Net loss, an indicator variable equal to one if a firm reported a negative net income in a quarter and zero otherwise	Compustat
RD	1 if a firm discloses research and development expenses in a quarter, and 0 otherwise	Compustat

Appendix A (continued)

Variable	**Definition**	**Source**
Institute	The percentage of institutional ownership at quarter-end	Thomson Refinitive
Fund_Size	The average size of all ESG funds that hold a firm. The size of each fund is measured by total net assets	CRSP
Fund_Yield	The average yield of all ESG funds that hold a firm	CRSP
Cross-sectional Tests		
Fog	1 if the Fog index of the focal ESG report is equal to or greater than 14, and 0 otherwise. Fog index is calculated as the sum of the average sentence length and the percentage of long words and then multiplied by 0.4	CorporateRegister.com and company websites
Image	1 if the number of images used in the focal ESG report is at or above the industry-year median level, and 0 otherwise	CorporateRegister.com and company websites
AcctAssu	1 if an ESG report is verified by an accounting firm, 0 otherwise	CorporateRegister.com and company websites
Link	1 if the total number of external verification, research and media links in a firm's ESG report is at or above the median industry-year level, and 0 otherwise	CorporateRegister.com and company websites
Pos (or Neg, Neu)	1 if the percentage of positive (or negative, neutral) sentences, scaled by the total number of sentences, in an ESG report is at or above the industry-year median level, and 0 otherwise	CorporateRegister.com and company websites
ESG (or E, S, G)	1 if the total number of environmental, social, and governance-related sentences (for *ESG*) or the number of environmental (*E*), social (*S*), or governance (*G*) sentences individually is greater than or equal to the industry-year median; 0 otherwise.	CorporateRegister.com and company websites
Additional Tests		
Dispersion_Rating	The standard deviation of the percentile ranks of ESG ratings from S&P Global, MSCI KLD, and Viego Eiris	S&P Global, MSCI KLD, and Viego Eiris

Table 1 Sample Selection

Total number of firm-quarter observations with ESG fund holdings	105,616 Obs
Less	
Observations corresponding to utility firms	(4,559 Obs)
Observations corresponding to financial firms	(27,094 Obs)
Observations with *Num_Fund* smaller than 3	(44,822 Obs)
Missing value of explanatory variables	(8,647 Obs)
Observations that are singletons	(1 Obs)
Final number of firm-quarter observations from 2006 Q1 to 2022 Q2	20,493 Obs

Table 2 Descriptive Statistics

VarName	Obs	Mean	SD	Min	P25	Median	P75	Max
Dispersion (ESG funds)	20,493	0.494	0.322	0.012	0.182	0.512	0.754	1.204
ESG_Disclosure (Indicator)	20,493	0.323	0.467	0.000	0.000	0.000	1.000	1.000
ESG_Disclosure (Continuous)	20,493	2.982	4.353	0.000	0.000	0.000	8.534	10.903
ESG_Disclosure (Continuous-subsample)	6,604	9.231	0.994	6.455	8.595	9.338	9.943	11.287
Firm_Size	20,493	8.726	1.454	5.811	7.666	8.609	9.659	12.468
BTM	20,493	-1.303	0.876	-4.205	-1.760	-1.195	-0.718	0.417
Mon_Ret	20,493	0.001	0.098	-0.315	-0.050	0.005	0.057	0.277
Ann_Ret	20,493	0.014	0.031	-0.074	-0.004	0.013	0.030	0.111
Idi_Vol	20,493	0.018	0.009	0.007	0.012	0.016	0.022	0.052
Turnover	20,493	0.009	0.007	0.002	0.005	0.007	0.011	0.047
Num_Fund	20,493	2.076	0.652	1.386	1.609	1.946	2.485	3.932
Ana_Dis	20,493	0.049	0.292	-1.464	0.016	0.037	0.086	1.414
Beta	20,493	1.060	0.306	0.355	0.853	1.040	1.245	1.908
Loss	20,493	0.174	0.379	0.000	0.000	0.000	0.000	1.000
RD	20,493	0.573	0.495	0.000	0.000	1.000	1.000	1.000
Institute	20,493	0.841	0.163	0.275	0.762	0.876	0.948	1.152
Fund_Size	20,493	5.633	0.711	3.700	5.213	5.671	5.957	7.591
Fund_Yield	20,493	0.003	0.003	0.000	0.001	0.002	0.004	0.014

This table presents descriptive statistics of variables used in the main tests. Variable definitions are outlined in Appendix A. All continuous variables are winsorized at their 1st and 99th percentiles.

Table 3 Hypothesis Test of the Effect of ESG Disclosure on ESG Investors' Beliefs

	Indicator	Continuous
VARIABLES	Dispersion	Dispersion
ESG_Disclosure	-0.019**	-0.002**
	(0.009)	(0.001)
Firm_Size	0.084***	0.084***
	(0.006)	(0.006)
BTM	-0.017***	-0.016***
	(0.006)	(0.006)
Mon_Ret	0.037*	0.037*
	(0.019)	(0.019)
Ann_Ret	0.802***	0.801***
	(0.102)	(0.102)
Idi_Vol	-3.542***	-3.539***
	(0.615)	(0.615)
Turnover	0.234	0.231
	(0.418)	(0.418)
Num_Fund	0.050***	0.050***
	(0.010)	(0.010)
Ana_Dis	0.003	0.003
	(0.008)	(0.008)
Beta	-0.003	-0.003
	(0.013)	(0.013)
Loss	-0.020**	-0.020**
	(0.009)	(0.009)
RD	0.023**	0.024**
	(0.012)	(0.012)
Institute	0.147***	0.147***
	(0.031)	(0.031)
Fund_Size	-0.016**	-0.016**
	(0.007)	(0.007)
Fund_Yield	-2.898***	-2.900***
	(0.990)	(0.990)
Constant	-0.336***	-0.337***
	(0.063)	(0.063)
Observations	20,493	20,493
Industry, Year, & Quarter FE	Yes	Yes
Cluster	Firm	Firm
Adj. R^2	0.326	0.326

This table presents the empirical results of estimating regression model (2). *ESG_Disclosure* is measured as an indicator variable that captures the issuance of ESG reports and as a continuous variable that captures the length of ESG reports. The outcome variable is dispersion in ESG funds' beliefs. Variable definitions are outlined in Appendix A. All continuous variables are winsorized at their 1st and 99th percentiles. Standard errors are clustered at the firm level and are presented in parentheses below the coefficients. ***, **, and * denote significance at the 1, 5, and 10 percent levels, respectively.

Table 4 Identification Strategy: BlackRock's "Dear CEO" Letters

Panel A: DID results

VARIABLES	Dispersion
Treat#Post	-0.220***
	(0.043)
Treat	0.013
	(0.045)
Observations	3,873
Controls	Yes
Industry, Year, & Quarter FE	Yes
Cluster	Firm
Adj. R^2	0.342

Panel B: Parallel trend test

VARIABLES	Dispersion
Pre3	-0.048
	(0.041)
Pre2	-0.058
	(0.055)
Current	-0.142**
	(0.062)
Post1	-0.238***
	(0.050)
Post2	-0.243***
	(0.048)
Post3	-0.282***
	(0.050)
Observations	3,873
Controls	Yes
Industry, Year, & Quarter FE	Yes
Cluster	Firm
Adj. R^2	0.343

This table presents the empirical results of an identification strategy that leverages BlackRock's 2018 "Dear CEO" Letter as a shock to its portfolio firms' ESG disclosure choices. The control observations are those not held by BlackRock's ESG funds and do not issue ESG reports. The treated observations are those held by BlackRock's ESG funds and issue ESG reports during the post-event period. Panel A presents the results of the DID test (model (3)) while Panel B presents the parallel trend test result. Variable definitions are outlined in Appendix A. All regressions include the industry, year, and quarter fixed effects. All continuous variables are winsorized at their 1st and 99th percentiles. Standard errors are clustered at the firm level and are presented in parentheses below the coefficients. ***, **, and * denote significance at the 1, 5, and 10 percent levels, respectively.

Table 5 Cross-Sectional Test: ESG Disclosure*Accessibility

Panel A Fog

VARIABLES	Dispersion
ESG_Disclosure_Fog	0.035**
	(0.018)
Fog	-0.273*
	(0.148)
ESG_Disclosure	-0.012*
	(0.007)
Observations	6,604
Controls	Yes
Industry, Year, & Quarter FE	Yes
Cluster	Firm
Adj. R^2	0.425

Panel B Image

VARIABLES	Dispersion
ESG_Disclosure_Image	-0.026***
	(0.009)
Image	0.241***
	(0.086)
ESG_Disclosure	0.005
	(0.008)
Observations	6,604
Controls	Yes
Industry, Year, & Quarter FE	Yes
Cluster	Firm
Adj. R^2	0.424

This table presents the moderation effect of ESG report accessibility on the association between dispersion in beliefs and ESG disclosure for the subsample with available ESG reports. Panel A and B correspond to models (4) and (5). Variable definitions are outlined in Appendix A. All continuous variables are winsorized at their 1st and 99th percentiles. Standard errors are clustered at the firm level and are presented in parentheses below the coefficients. ***, **, and * denote significance at the 1, 5, and 10 percent levels, respectively.

Table 6 Cross-Sectional Test: ESG Disclosure* Credibility

Panel A Accounting verifier

VARIABLES	Dispersion
ESG_Disclosure_AcctAssu	-0.027*
	(0.016)
AcctAssu	0.270*
	(0.158)
ESG_Disclosure	-0.007
	(0.007)
Observations	6,604
Controls	Yes
Industry FE, Year, & Quarter FE	Yes
Cluster	Firm
Adj. R^2	0.423

Panel B Link

VARIABLES	Dispersion
ESG_Disclosure_Link	-0.036***
	(0.014)
Link	0.350***
	(0.126)
ESG_Disclosure	0.023*
	(0.013)
Observations	6,604
Controls	Yes
Industry, Year, & Quarter FE	Yes
Cluster	Firm
Adj. R^2	0.424

Panel C Tone

	(1) Pos	(2) Neg	(3) Neu
VARIABLES	Dispersion	Dispersion	Dispersion
ESG_Disclosure_Pos/Neg/Neu	-0.003	-0.020**	-0.020**
	(0.008)	(0.009)	(0.008)
Pos/Neg/Neu	0.007	0.170**	0.179**
	(0.075)	(0.085)	(0.074)
ESG_Disclosure	-0.008	0.002	0.003
	(0.008)	(0.007)	(0.008)
Observations	6,604	6,604	6,604
Controls	Yes	Yes	Yes
Industry, Year, & Quarter FE	Yes	Yes	Yes
Cluster	Firm	Firm	Firm
Adj. R^2	0.424	0.424	0.424

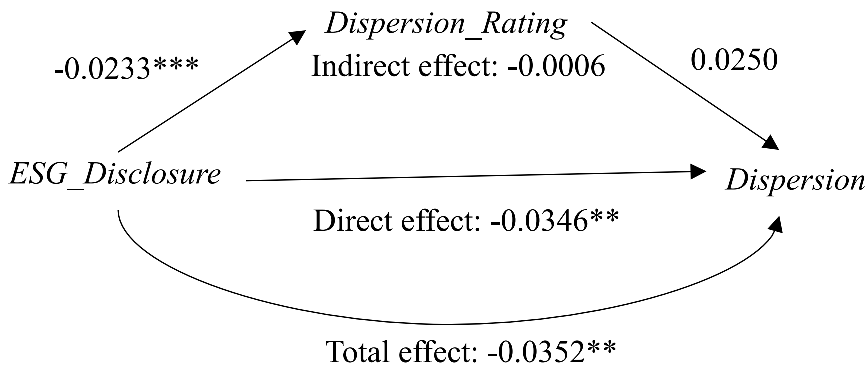
This table presents the moderation effect of ESG report credibility on the association between dispersion in beliefs and ESG disclosure for the subsample with ESG reports available. Panel A, B, C correspond to models (6), (7), and (8). Variable definitions are listed in Appendix A. Continuous variables are winsorized at 1st and 99th percentiles. Standard errors are clustered at the firm level and are presented in parentheses below the coefficients. ***, **, and * denote significance at the 1, 5, and 10 percent levels, respectively.

Table 7 Cross-Sectional Test: ESG Disclosure* Topical Content

	(1) ESG	(2) E	(3) S	(4) G
VARIABLES	Dispersion	Dispersion	Dispersion	Dispersion
ESG_Disclosure_ESG/E/S/G_sentence	-0.022**	-0.029***	-0.020**	-0.016
	(0.011)	(0.010)	(0.010)	(0.011)
ESG/E/S/G_sentence	0.191*	0.260***	0.184*	0.154
	(0.101)	(0.096)	(0.095)	(0.102)
ESG_Disclosure	0.006	0.007	0.002	-0.003
	(0.010)	(0.008)	(0.009)	(0.009)
Observations	6,604	6,604	6,604	6,604
Controls	Yes	Yes	Yes	Yes
Industry, Year, & Quarter FE	Yes	Yes	Yes	Yes
Cluster	Firm	Firm	Firm	Firm
Adj. R^2	0.424	0.424	0.423	0.423

This table presents an additional test – model (9) – on the (combined) environmental, social, and governance-related content in ESG reports and how the association between dispersion in beliefs and ESG disclosure for the subsample with ESG reports available varies with the topical content. Variable definitions are outlined in Appendix A. All continuous variables are winsorized at their 1st and 99th percentiles. Standard errors are clustered at the firm level and are presented in parentheses below the coefficients. ***, **, and * denote significance at the 1, 5, and 10 percent levels, respectively.

Table 8 Additional Test: Path Analysis



Proportion of total effect that is mediated: 1.7%
Ratio of indirect to direct effect: 1.7%
Ratio of direct to total effect: 98.3%

This figure presents the mediation test of ESG disclosure, ESG rating dispersion and dispersion in ESG investors' beliefs, as described in Section 7. For simplicity, we show the coefficients and significance levels of the direct, total, and mediation effects on the triangle diagram. The proportion of the total effect that is mediated is the ratio of the indirect to the total effect. All regressions include industry, year, and quarter fixed effects. Standard errors are clustered at the firm level. All continuous variables are winsorized at their 1st and 99th percentiles. ***, **, and * denote significance at the 1, 5, and 10 percent levels, respectively.

Table 9 Additional Test: The Association between ESG Disclosure and Dispersion in ESG vs. Non-ESG Investors' Beliefs

Panel A Individual tests

	Indicator		Continuous	
	ESG investors	Non-ESG investors	ESG investors	Non-ESG investors
VARIABLES	Dispersion	Dispersion	Dispersion	Dispersion
ESG_Disclosure	-0.027**	-0.006*	-0.003**	-0.001
	(0.012)	(0.003)	(0.001)	(0.000)
Firm_Size	0.082***	0.063***	0.083***	0.063***
	(0.007)	(0.003)	(0.007)	(0.003)
BTM	-0.020**	-0.005**	-0.020**	-0.005**
	(0.008)	(0.003)	(0.008)	(0.003)
Mon_Ret	0.026	0.066***	0.026	0.066***
	(0.026)	(0.008)	(0.026)	(0.008)
Ann_Ret	0.859***	0.255***	0.859***	0.256***
	(0.135)	(0.038)	(0.135)	(0.038)
Idi_Vol	-4.212***	-0.912***	-4.206***	-0.909***
	(0.890)	(0.265)	(0.890)	(0.265)
Turnover	0.923	-0.418**	0.920	-0.419**
	(0.573)	(0.166)	(0.573)	(0.166)
Num_Fund	0.063***	0.000***	0.063***	0.000***
	(0.013)	(0.000)	(0.013)	(0.000)
Ana_Dis	-0.009	-0.004	-0.009	-0.004
	(0.012)	(0.003)	(0.012)	(0.003)
Beta	0.012	0.003	0.012	0.003
	(0.017)	(0.005)	(0.017)	(0.005)
Loss	-0.016	0.001	-0.016	0.001
	(0.011)	(0.003)	(0.011)	(0.003)
RD	0.019	0.005	0.019	0.005
	(0.015)	(0.004)	(0.015)	(0.004)
Institute	0.132***	0.092***	0.132***	0.092***
	(0.042)	(0.014)	(0.042)	(0.014)
Fund_Size	-0.013	-0.058***	-0.013	-0.059***
	(0.010)	(0.007)	(0.010)	(0.007)
Fund_Yield	-3.412***	0.946***	-3.414***	0.939***
	(1.204)	(0.333)	(1.204)	(0.333)
Constant	-0.363***	0.291***	-0.364***	0.293***
	(0.084)	(0.047)	(0.084)	(0.047)
Observations	12,832	12,832	12,832	12,832
Industry, Year, & Quarter FE	Yes	Yes	Yes	Yes
Cluster	Firm	Firm	Firm	Firm
Adj. R^2	0.368	0.714	0.368	0.714

Table 9 (continued)

Panel B Stacked regressions

	Indicator	Continuous
VARIABLES	Dispersion	Dispersion
*ESG_Disclosure*ESG_Group_Indicator*	-0.029**	-0.003***
	(0.011)	(0.001)
ESG_Disclosure	-0.002	-0.000
	(0.005)	(0.001)
ESG_Group_Indicator	-0.404***	-0.407***
	(0.090)	(0.090)
Other control variables	Yes	Yes
Other control variables ESG_Group_Indicator*	Yes	Yes
Observations	25,664	25,664
Industry, Year, & Quarter FE	Yes	Yes
Cluster	Firm	Firm
Adj. R^2	0.390	0.390

Panel A of this table presents the separate results of the impact of ESG disclosure on dispersion within two groups: ESG investors and non-ESG investors. The independent variable, *ESG_Disclosure*, is measured as an indicator variable that captures the issuance of ESG reports and a continuous variable that captures the length of ESG reports. The outcome variables are dispersion in ESG funds' beliefs, and dispersion in non-ESG funds' beliefs. Panel B presents the results from a stacked regression that tests cross-model differences in the coefficient on *ESG_Disclosure*. Variable definitions are outlined in Appendix A. All continuous variables are winsorized at their 1st and 99th percentiles. Standard errors are clustered at the firm level and are presented in parentheses below the coefficients. ***, **, and * denote significance at the 1, 5, and 10 percent levels, respectively.

Table 10 Robustness Check: Within-Firm Analysis of the First-Time ESG Issuance

	(1)	(2)
VARIABLES	Dispersion	Dispersion
Post	-0.026**	-0.026**
	(0.011)	(0.013)
Firm_Size	0.118***	0.118***
	(0.014)	(0.025)
BTM	0.041***	0.041*
	(0.013)	(0.023)
Mon_Ret	0.056	0.056
	(0.034)	(0.036)
Ann_Ret	0.676***	0.676***
	(0.148)	(0.211)
Idi_Vol	-4.607***	-4.607***
	(0.850)	(1.181)
Turnover	0.369	0.369
	(0.605)	(0.788)
Num_Fund	0.058***	0.058***
	(0.013)	(0.022)
Ana_Dis	0.010	0.010
	(0.010)	(0.009)
Beta	0.010	0.010
	(0.016)	(0.025)
Loss	-0.034***	-0.034**
	(0.011)	(0.014)
RD	-0.013	-0.013
	(0.016)	(0.017)
Institute	0.395***	0.395***
	(0.070)	(0.116)
Fund_Size	-0.007	-0.007
	(0.008)	(0.013)
Fund_Yield	-3.971**	-3.971**
	(1.569)	(1.791)
Constant	-0.788***	-0.788***
	(0.142)	(0.243)
Observations	4,499	4,499
Firm, Year, & Quarter FE	Yes	Yes
Cluster	No	Firm
Adj. R^2	0.652	0.652

This table presents the robustness test results of estimating model (10) on a subset of the full sample, including observations eight quarters before and after the first ESG report issuance. In column (1), the model uses standard errors without clustering at the firm level, while column (2) uses clustering at the firm level for standard errors. All continuous variables are winsorized at their 1st and 99th percentiles. Standard errors are presented in parentheses below the coefficients. ***, **, and * denote significance at the 1, 5, and 10 percent levels, respectively.

Table 11 Robustness Check: Apply a First Differencing Model

	Indicator	Continous
VARIABLES	d.Dispersion	d.Dispersion
d.ESG_Disclosure	-0.013**	-0.001*
	(0.006)	(0.001)
d.Firm_Size	0.146***	0.145***
	(0.013)	(0.013)
d.BTM	-0.004	-0.004
	(0.010)	(0.010)
d.Mon_Ret	0.067***	0.067***
	(0.013)	(0.013)
d.Ann_Ret	0.111	0.112
	(0.079)	(0.079)
d.Idi_Vol	0.689	0.687
	(0.631)	(0.631)
d.Turnover	0.134	0.135
	(0.279)	(0.279)
d.Num_Fund	0.082***	0.082***
	(0.011)	(0.011)
d.Ana_Dis	-0.012***	-0.012***
	(0.004)	(0.004)
d.Beta	-0.012	-0.012
	(0.011)	(0.011)
d.Loss	-0.003	-0.003
	(0.005)	(0.005)
d.RD	0.002	0.002
	(0.005)	(0.005)
d.Institute	0.110**	0.110**
	(0.056)	(0.056)
d.Fund_Size	-0.011	-0.011
	(0.007)	(0.007)
d.Fund_Yield	-1.390**	-1.393**
	(0.651)	(0.651)
Constant	-0.005***	-0.005***
	(0.001)	(0.001)
Observations	14,874	14,874
Industry, Year, & Quarter FE	Yes	Yes
Cluster	Firm	Firm
Adj. R^2	0.048	0.048

This table displays the result of robustness test conducted by estimating equation (11), which modifies equation (2) by first differencing all variables. The variable *ESG_Disclosure* is an indicator variable, representing the issuance of ESG reports. "d." denotes the first-level difference of the respective variables. All continuous variables are winsorized at their 1st and 99th percentiles. Standard errors are clustered at the firm level and are presented in parentheses below the coefficients. ***, **, and * denote significance at the 1, 5, and 10 percent levels, respectively.

Table 12 Robustness Check: Entropy Balancing

	Indicator	Continuous
VARIABLES	Dispersion	Dispersion
ESG_Disclosure	-0.034***	-0.004***
	(0.012)	(0.001)
Firm_Size	0.076***	0.076***
	(0.011)	(0.011)
BTM	-0.006	-0.006
	(0.011)	(0.011)
Mon_Ret	0.056*	0.056*
	(0.032)	(0.032)
Ann_Ret	0.961***	0.962***
	(0.175)	(0.175)
Idi_Vol	-4.708***	-4.726***
	(1.142)	(1.141)
Turnover	-0.195	-0.186
	(0.655)	(0.655)
Num_Fund	0.062***	0.062***
	(0.015)	(0.015)
Ana_Dis	0.001	0.001
	(0.012)	(0.012)
Beta	-0.044**	-0.044**
	(0.021)	(0.021)
Loss	-0.002	-0.001
	(0.013)	(0.013)
RD	0.035**	0.036**
	(0.018)	(0.018)
Institute	0.150***	0.150***
	(0.051)	(0.052)
Fund_Size	0.008	0.008
	(0.011)	(0.011)
Fund_Yield	-0.508	-0.530
	(1.531)	(1.531)
Constant	-0.344***	-0.345***
	(0.115)	(0.115)
Observations	10,674	10,674
Industry, Year, & Quarter FE	Yes	Yes
Cluster	Firm	Firm
Adj. R^2	0.236	0.236
Maximum Weight	1.532	1.532

This table presents the results of estimating model (2) for the main test using the entropy-balanced sample. Variable definitions are outlined in Appendix A. All continuous variables are winsorized at their 1st and 99th percentiles. Standard errors are clustered at the firm level and are presented in parentheses below the coefficients. ***, **, and * denote significance at the 1, 5, and 10 percent levels, respectively.