ESG Investing and Stock Price Informativeness

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Abstract

This study examines the impact of environmental, social, and governance (ESG) investing on stock price informativeness, using 53,188 U.S. stock-quarter observations from 1996 to 2020. Price informativeness, measured as the reduction in uncertainty about future earnings based on current prices, improves with higher ESG institutional ownership. The effect is more pronounced for firms with lower ESG performance and higher ESG disclosure quality. Mechanism analysis identifies two possible channels: improved information environments, indicated by increased analyst coverage and EDGAR search volume; and long-term ESG engagement, which promotes sustainable practices and reduces uncertainty.

Keywords: ESG investing, Stock Price Informativeness, Institutional Investors
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> "ESG, at its core, is the expansion of an investor's information set to incorporate environmental, social, and governance factors. Increasing information should never make an investor worse off, as it can be discarded if it has no value."
>
> – *Rational Sustainability, Edmans (2024)*

1 Introduction

ESG investing[1], which integrates environmental, social, and governance (ESG) criteria into investment decisions, has witnessed remarkable growth over the last decade. Since the launch of the United Nations Principles for Responsible Investment (UNPRI) in 2006, the number of signatories has surged from 63 to 5,345 in 2024, with assets under management (AUM) increasing from $6.5 trillion to $128.4 trillion (See Figure 1). This rapid expansion has drawn substantial academic interest, particularly in understanding ESG's implications for institutional preferences and investment performance[2]. However, relatively little attention has been given to a potentially more significant question: the impact of ESG investing on stock price informativeness about future fundamentals.

Price informativeness is not merely a technical concept but also carries significant welfare implications. More informative prices reduce uncertainty for market participants, enabling them to better forecast future earnings based on current price observations (Bai et al., 2016; Dávila & Parlatore, 2025). This reduction in uncertainty fosters more efficient resource allocation and enhances the decision-making process for investors, firms, and policymakers. While the theoretical literature provides initial insights into the impact of ESG investing on stock price informativeness, it remains inconclusive. For instance, Goldstein et al. (2024) develop a model of asset price formation that incorporates heterogeneous preferences for ESG factors. They argue that the growth of green investors, who emphasize ESG performance factors, reduces price informativeness regarding future financial performance. In contrast, Avramov et al. (2024) model active fund management with ESG considerations and document that ESG investing incentivizes information acquisition, thereby broadening the private information sets incorporated into stock prices and improving price informativeness.

This study contributes to the ongoing debate by providing empirical evidence on the

[1] In the literature, it is also referred to as sustainable or responsible investing.

[2] See, e.g., Avramov et al. (2024), Bolton and Kacperczyk (2021), Cao et al. (2023), Hartzmark and Sussman (2019), Hwang et al. (2022), and Pástor et al. (2024) for evidence of institutional preference on ESG criteria, Ardia et al. (2023), Aswani et al. (2024), Baker et al. (2022), Bolton and Kacperczyk (2023), and Pástor et al. (2021, 2022) for the performance of sustainable investing.

relation between ESG investing and stock price informativeness. Specifically, it addresses the gap in the literature by examining whether the rapid integration of ESG criteria into investment practices enhances or diminishes price informativeness. This analysis is particularly significant given the increasing global focus on ESG as a cornerstone of sustainable development, offering insights for investors, firms, and policymakers navigating the evolving landscape of sustainable finance.

We examine this question using 53,188 stock-quarter observations of U.S. common stocks listed on the NYSE, NASDAQ, and AMEX. We begin by defining our key variables. Price informativeness (PI), following Dávila and Parlatore (2025), is defined as the reduction in uncertainty about future earnings after observing current stock prices, and is quantified using their empirical method. ESG institutional investors are defined as 13F institutions whose stock holdings have MSCI KLD ESG net scaled scores in the top one-third each quarter, following Lins et al. (2017), Hwang et al. (2022), and Cao et al. (2023), and then ESG institutional ownership ($ESGIO$) is calculated as the proportion of shares held by ESG institutions to total shares held by all 13F institutions.

Then, we estimate the impact in a regression of price informativeness on ESG institutional ownership, controlling for stock market capitalization ($lnMktCap$), Book-to-Market ratio ($lnBM$), idiosyncratic volatility ($IVol$), turnover ($Turnover$), institutional ownership (IO) and analyst coverage ($lnAnalyst$), a set of variables that have been documented to have impacts on price informativeness (Cao et al., 2023; Dávila & Parlatore, 2025). Our regression analysis demonstrates that ESG investing enhances price informativeness, with stocks exhibiting higher ESG institutional ownership showing greater price informativeness. Economically, one standard deviation increase in ESG institutional ownership leads to a 1.5% increase in price informativeness relative to its unconditional mean. We confirm the robustness of our findings using alternative constructions of ESG institutional ownership and price informativeness. Results from variations based on ESG strength and net scores, as well as a welfare-based price informativeness measure following Bai et al. (2016), consistently demonstrate that higher ESG institutional ownership significantly enhances stock price informativeness across multiple specifications and time horizons.

We also examine the heterogeneity in the relation between ESG institutional ownership and stock price informativeness across stocks with differing ESG characteristics. Our results indicate that this positive relationship is stronger for stocks with lower ESG performance, suggesting that ESG investors may target these stocks, possibly anticipating future improvements that attract additional investor scrutiny and analysis. Furthermore, we find that the

relationship is more pronounced for stocks with higher ESG disclosure scores, as enhanced transparency facilitates better-informed investment decisions. These findings highlight the variation in the impact of ESG institutional ownership on price informativeness across stocks with distinct ESG profiles.

Next, we explore two mechanisms through which ESG investing may enhance stock price informativeness: 1) improved information environment, and 2) ESG investor engagement. First, the incorporation of information into stock prices, a necessary process of enhancing price informativeness, relies on information acquisition and dissemination (Drake et al., 2015; Goldstein, 2023). Also, Avramov et al. (2024) document that sustainable investing incentivizes mutual funds to intensify information acquisition. Thus, it is plausible that ESG investing amplifies information acquisition, thereby improving the information environment. We rely on the search volume computed from the log file of the Electronic Data Gathering, Analysis, and Retrieval (EDGAR) system as our information acquisition proxy. EDGAR system, which hosts all mandatory filings by listed companies, enables investors to more frequently and freely access the mandatory disclosures to inform their trading decisions (Chen et al., 2020a; Gibbons et al., 2021; Landsman et al., 2024). Our regression of EDGAR search volume ($EDGAR$) on ESG institutional ownership ($ESGIO$) reveals that ESG investing indeed motivates more information acquisition, in that one standard deviation increase in ESG ownership leads to an additional 248 search activities.

Analyst coverage is believed to be a complementary source of information to original information disclosures and play a key role in information dissemination (Chen et al., 2020a). Increased ESG ownership increases investor demand for ESG-related information, incentivizing analysts to focus more on ESG-relevant stocks and incorporate ESG factors into their reports to align with market trends (Hartzmark & Sussman, 2019) and career incentives (Beyer et al., 2010; Harford et al., 2019). As such, we predict and confirm in the regression of the number of analyst coverage on ESG institutional ownership that higher ESG ownership is associated with higher analyst coverage. More specifically, one standard deviation increase in ESG ownership leads to 1.67% increase in analyst coverage.

Information acquisition is necessary but insufficient for enhanced price informativeness. It naturally gives rise to informed trading, where investors utilize the acquired information to make strategic trading decisions. This informed trading is both a natural outcome of increased information acquisition and a crucial step in the process, as it drives the incorporation of valuable information into stock prices, thereby improving their informativeness. As part of our mechanism analysis of the improved information environment, we demonstrate

that increased information acquisition and dissemination lead to more informed trading and less noise trading. First, we show that trades by ESG institutions—measured by the absolute change in their quarterly holdings—are associated with improved price informativeness. This implies that ESG institutions engage in informed trading. Alternatively, relying on the probability of informed trading (PIN), developed by Easley et al. (1996) and widely used in the literature (Blanco et al., 2024; Chen et al., 2007; Easley et al., 1997, 1998), we find that stocks with higher ESG ownership exhibit a greater probability of informed trading. This finding supports our hypothesis that ESG investing motivates increased information acquisition, leading to more informed trading.

In addition, ESG ownership is associated with reduced sentiment beta, effectively mitigating the impact of marketwide investor sentiment, which is often linked to noise trading and less informative prices (Baker & Wurgler, 2006; DeLong et al., 1990; Stambaugh et al., 2012). This reduction in sentiment-driven price movements suggests that stocks held by ESG institutions are less influenced by irrational investor behavior and instead align more closely with fundamental values. Thus, these results collectively demonstrate that ESG investing enhances the information environment by promoting both information acquisition and dissemination, which subsequently leads to more informed trading and reduced noise trading. By fostering a more robust incorporation of fundamental information into stock prices, ESG ownership plays a pivotal role in improving price informativeness through this mechanism.

Second, we examine the feasibility of our second mechanism of ESG engagement. This mechanism is based on the premise that long-term ESG investors are more likely to actively engage with firms to promote sustainable practices, enhance long-term performance, and reduce uncertainty in predicting future outcomes (Hoepner et al., 2023; Roncalli, 2022). Our findings support this premise, showing that dedicated ESG ownership, representing long-term engaged investors identified using the method of Bushee and Noe (2000), is significantly associated with higher stock price informativeness. By fostering sustainable practices and aligning financial and ESG performance, long-term ESG engagement strengthens the link between current stock prices and future earnings, thereby leading to enhanced price informativeness.

This study contributes to at least three strands of literature. First, we contribute to the growing body of literature on ESG investing. Previous studies have thoroughly documented preferences for environmental, social, and governance (ESG) metrics in investing (Cao et al., 2023; Edmans et al., 2024a; Hartzmark & Sussman, 2019; Krueger et al., 2020, among others) and have examined the performance of ESG-focused investments (Ardia et al., 2023;

Aswani et al., 2024; Pástor et al., 2021, 2022; Pedersen et al., 2021, among others). For example, institutional investors care about sustainability and exhibit ESG preferences (Cao et al., 2023; Hartzmark & Sussman, 2019), and also tilt their portfolio to green stocks in portfolio management practices (Pástor et al., 2024). These ESG preferences and investing practices also have impacts on firm's ESG profile (Chen et al., 2020b; Dyck et al., 2019), as well as the risk and return profile. Pedersen et al. (2021) propose an ESG-efficient frontier, extending traditional mean-variance optimization by incorporating ESG considerations into the investment decision-making process. Pástor et al. (2021, 2022) show that sustainable investing yields lower expected returns for two reasons: investors' nonpecuniary preferences and the fact that greener assets serve as a better hedge against climate risk. This study contributes by extending ESG preference to examine its impact on stock price informativeness, revealing how ESG-oriented investment behavior enhances the precision of price signals, thereby reducing uncertainty about future asset payoffs.

More specifically, our study provides empirical evidence to the theoretical models. Two directly linked contemporaneous theoretical models examine the impact of ESG investing on stock price informativeness. While Goldstein et al. (2024)'s model predicts the growth of green investors, who emphasize ESG performance factors, reduces price informativeness regarding future financial performance, Avramov et al. (2024) argue that ESG investing incentivizes information acquisition, thereby broadening the private information sets incorporated into stock prices and improving price informativeness. Our evidence that ESG investing improves the information environment, increases informed trading, and reduces noise trading, leading to higher stock price informativeness, is consistent with Avramov et al. (2024).

Second, we contribute to the literature on stock price informativeness, which examines the extent to which stock prices reflect firm fundamentals. Seminal works by Grossman and Stiglitz (1980) and Hellwig (1980) provide the theoretical foundation for information aggregation in financial markets. Traditional measures, such as return nonsynchronicity (Roll, 1988), have been widely used but criticized for their lack of structural interpretability (Hou et al., 2013). Bond et al. (2012) distinguish between forecasting price efficiency (FPE), which captures the predictive power of prices for future fundamentals, and revelatory price efficiency (RPE), which focuses on the role of prices in guiding decision-making. More recent approaches, such as the FPE measure by Bai et al. (2016), emphasize a welfare-based perspective. Dávila and Parlatore (2025) further advance the field by developing a robust identification framework that enhances the precision and interpretability of relative price informativeness. We contribute to this literature by applying Dávila and Parlatore (2025)'s

measure to investigate how ESG investing influences the incorporation of information into stock prices.

Third, this study contributes to the literature on the heterogeneity among institutional investors, as well as its impact on market efficiency. Institutional investors as a group have long been recognized for enhancing market efficiency (e.g., Asquith et al., 2005; Boehmer and Kelley, 2009; Cao et al., 2018; Dávila and Parlatore, 2025; Sias et al., 2006), however, their efficacy of efficiency enhancement can vary due to the heterogeneity among institutions, e.g., investing style, or investing horizon. For example, hedge funds (Akbas et al., 2015; Cao et al., 2018), and short-term institutions (Yan & Zhang, 2009) are more informed and are more capable of improving price efficiency. This study instead focuses on a growing dimension of heterogeneity among institutions, their ESG preferences, and examines how this variation influences their ability to enhance market efficiency. Previous studies explore which groups of investors are more likely to tilt toward green investments and propose methods to identify them. An early study by Hong and Kacperczyk (2009) highlights that institutions such as pension funds and banks, rather than hedge funds, are more constrained by societal norms and therefore more likely to avoid sin stocks. Starks et al. (2017) evaluate ESG preferences based on institutions' investment horizons, finding that long-term institutional investors tend to tilt their portfolios toward firms with better ESG profiles. More recent studies identify ESG institutions using the ESG ratings of their holdings (e.g., Avramov et al., 2024; Hwang et al., 2022), UNPRI signatory status (e.g., Gibson Brandon et al., 2022; Kim and Yoon, 2023), and Morningstar's sustainability globe ratings (e.g., Döttling and Kim, 2024; Hartzmark and Sussman, 2019). Our study extends and provides evidence that institutional investors' integration of ESG information enhances stock price informativeness.

The paper is organized as follows. Section 2 reviews two closely related theoretical models and other relevant literature to draw our hypotheses. Section 3 introduces our data and sample. Section 4 presents our baseline results and heterogeneity analysis. Section 5 explores the possible channels through which ESG investing impacts stock price informativeness. Section 6 concludes the paper.

2 Conceptual Framework and Hypothesis Development

The impact of ESG investing on stock price informativeness is inconclusive. On the one hand, ESG investing may hinder the incorporation of financial information into stock price, leading to a reduction in stock price informativeness about future payoffs. Institutional

investors with ESG preferences tend to overweight the ESG-related performance, e.g., social impact, of the investee firm, while underweighting the financial performance, e.g., EBIT. This heterogeneous preference for ESG performance shifts the focus away from traditional financial metrics, which have historically been central to price informativeness in financial markets (Dávila & Parlatore, 2025; Goldstein et al., 2024). Cao et al. (2023) find that socially responsible (SR) institutional investors react less to mispricing factors, and the abnormal returns based on these factors are significantly greater for stocks with higher SR institutional ownership. Similarly, in a rational expectations equilibrium model, Goldstein et al. (2024) argue that traditional investors and ESG investors are both informed about ESG and financial performance but trade in opposite directions. As a result, the growing presence of ESG investors may weaken the incorporation of financial payoff information into stock prices.

This premise is further supported by the idea that ESG information and financial information may act as substitutes due to the constraints of investors' limited attention and information processing capacity (Goldstein et al., 2024; Yang et al., 2023). ESG institutional investors often prioritize nonpecuniary benefits, such as the social or environmental impact of their investments, and may willingly sacrifice financial payoffs to achieve these goals (Pástor et al., 2021; Pedersen et al., 2021). This substitution effect reduces the emphasis on financial payoff in trading, leading to less efficient incorporation of financial information into stock prices. As ESG investors grow in prominence and ESG information quality improves, stock prices may become less informative about future financial performance.

- **H1a: ESG investing decreases stock price informativeness.**

One the other hand, ESG investing can improve the stock price informativeness about future fundamentals in at least three aspects. First, ESG investing encourages amplified information acquisition, particularly for stocks with ESG profiles that deviate significantly from green neutrality (Avramov et al., 2024). This intensified focus on information acquisition reduces uncertainty about financial payoffs, increasing the precision of private signals and facilitating more informed trading, which enhances the informativeness of stock prices. Moreover, Avramov et al. (2024) emphasize the role of heterogeneous ESG preferences among investors, ranging from ESG-perceptive to ESG-indifferent, which fosters diverse perspectives and ensures a broader set of private information is incorporated into stock prices. Consequently, the posterior variance of asset payoffs decreases, and hence stock price informativeness improves.

Second, ESG performance is indeed interlinked with financial performance. ESG investing encourages firms to adopt practices that align sustainability with financial performance, enhancing stock price informativeness about future financial payoffs. ESG investors prioritize initiatives such as climate risk management and employee well-being, which contribute directly to long-term value creation. For example, Edmans (2011) and Edmans et al. (2024b) find that higher employee satisfaction is associated with superior long-term returns, while Bofinger et al. (2022) show a strong positive correlation between ESG performance and firm value. These outcomes highlight how the emphasis placed by ESG investors on sustainable practices can drive financial stability and predictability.

Furthermore, the future-oriented nature of ESG investing encourages both firm managers and investors to prioritize drivers of sustainable growth that align with financial stability and profitability (Khan et al., 2016; Serafeim & Yoon, 2022). This perspective reflects a growing recognition among institutional investors that ESG and financial performance are not separate concerns but are fundamentally linked. Edmans et al. (2024a) provide empirical evidence that institutional investors, both traditional and ESG-focused, increasingly view these dimensions as mutually reinforcing. By actively engaging with firms, ESG investors promote the integration of sustainability into core business strategies, ensuring that these efforts enhance long-term financial performance. This alignment improves the quality of information embedded in stock prices, making them more reflective of future financial fundamentals.

Third, ESG investing enhances stock price informativeness by addressing downside risk, a critical factor influencing the quality of price signals. Downside risk, given the skewness and heavy tails of stock return distributions, provides a more informative measure that better captures investors' perceptions of risk (Harlow, 1991). ESG engagement stabilizes firms by reducing the likelihood and severity of negative events, improving their operational and financial resilience (Hoepner et al., 2023). This reduction in downside risk has a direct impact on the precision of price signals, as it decreases noise and enhances the predictability of future cash flows. By promoting firm stability and resilience, ESG investing ensures that stock prices better reflect fundamental values. As a result, the information embedded in stock prices becomes more reliable and aligned with future financial fundamentals, improving overall price informativeness.

- **H1b: ESG investing improves stock price informativeness.**

3 Data and Sample

3.1 Data Sources

This study focuses on the US common stocks listed in NYSE, NASDAQ, and AMEX exchanges. Our sample covers 1,278 unique stocks from 1996Q1 to 2020Q4. We obtain stock prices, returns, and trading volume from Center for Research in Security Prices (CRSP), quarterly accounting data from Compustat, 13F institutional holdings from Refinitiv, and data on Environmental, Social and Governance (ESG) performance from MSCI ESG KLD STATS database.

3.2 Key Measures

Price Informativeness. We follow Dávila and Parlatore (2025) to construct our dependent variable, price informativeness (PI). They define PI as the precision of the signal about future payoffs contained in asset prices, and hence higher price informativeness indicates investors can glean more information about future payoffs from current asset prices. They formally identify the price informativeness in a structural model, as well as show how to estimate the price informativeness in simple OLS regression. Specifically, for each stock-quarter combination, the following time series regressions are estimated using year-on-year changes with overlapping data over rolling windows of 40 quarters.

$$\Delta p_t^i = \bar{\beta}^i + \beta_0 \Delta x_t^i + \beta_1 \Delta x_{t+4}^i + \varepsilon_t^i \quad \Rightarrow R^{2,i}_{\Delta x, \Delta x'} \tag{1}$$

$$\Delta p_t^i = \bar{\zeta}^i + \zeta_0 \Delta x_t^i + \varepsilon_t^i \quad \Rightarrow R^{2,i}_{\Delta x} \tag{2}$$

where Δp_t^i is the change of log price of stock i, Δx_t^i and its one-year ahead counterpart Δx_{t+4}^i are change of payoff, proxied by EBIT. The price informativeness is then obtained as:

$$PI = \tau_\pi^{R,i} = \frac{R^{2,i}_{\Delta x, \Delta x'} - R^{2,i}_{\Delta x}}{1 - R^{2,i}_{\Delta x}}. \tag{3}$$

Our baseline analysis uses the price informativeness one year ahead, but we also estimate longer-horizon price informativeness, i.e., 2-year and 3-year price ahead price informativeness, for robustness check. On average, sample stocks have average price informativeness equal to 0.093, indicating that the uncertainty about future asset payoff is reduced by 9.3% for an external observer after observing the current asset price. The 2-year and 3-year ahead price

informativeness are lower, with mean equal to 0.056 and 0.048 respectively (See Panel A in Table 1).

ESG Institutional Ownership. We follow Hwang et al. (2022) and Cao et al. (2023), constructing ESG institution ownership in four steps. We rely on MSCI KLD ESG rating to label 13F institutional investors first and then aggregate their holdings.

First, we calculate a net ESG score for each stock in each year. The MSCI KLD ESG database, a widely utilized resource in academic research (e.g., Cao et al., 2023; Hwang et al., 2022; Lins et al., 2017; Pástor et al., 2021, 2022, 2024), provides detailed annual ESG performance data for approximately the 3,000 largest U.S. companies. The database includes around 80 indicators, in the form of strength or concen, that measure various aspects of environmental, social, and governance (ESG) performance. These indicators are grouped into 13 categories. In line with common practices in the literature, this study focuses on seven key categories: community, corporate governance, diversity, employee relations, environment, human rights, and product issues[3]. The rating on each indicator is binary, with "1" ("0") indicating the presence (absence) of strength or concern and "NR" indicating that indicator is not researched. For each categories, we are interested in the difference between the sum of strengths and the sum of concerns. Since the maximum number of strengths and concerns for each category varies over time (Lins et al., 2017), we scale the strengths (concerns) by dividing the number of strengths (concerns) for each firm-year by the maximum number of strengths (concerns) for that category in that year[4]. As such, the net ESG performance per category range from -1 to +1. Last, the toal net scaled ESG score for stock i is obtained by combining the net scores across seven categories.

$$ESG_i = \sum_{\text{Categories}} \left(\frac{\#\text{ of strengths}}{\text{Max }\#\text{ of Strengths}} - \frac{\#\text{ of Concerns}}{\text{Max }\#\text{ of Concerns}} \right) \tag{4}$$

Since larger firms tend to have higher ESG score (Cao et al., 2023; Hwang et al., 2022), we size-adjust the above ESG score[5]. We sort stocks based on market capitalization into 10 deciles, within each decile we subtract the average ESG score of the decile from the raw

[3]We do not include the other six categories, namely alcohol, gambling, firearms, military, nuclear, and tobacco. As discussed by Lins et al. (2017), these categories penalize participation in the six industries that are considered controversial, as there is nothing incremental that firms operating in these industries can do to change their score except exit those industries

[4]Previous studies also use the net score, the difference between the sum of strengths and the sum of concerns (Cao et al., 2023); and the strength score, the number of strengths (Hwang et al., 2022). Our results hold, both quantitatively and qualitatively, if we instead use these two alternative ESG score measures.

[5]Our results hold if we instead use raw ESG score, as we present in robustness check.

ESG score to obtain the size-adjusted ESG score. For our sample, the mean raw ESG score is 0.101 and the sized-adjusted ESG score is 0.005 (See Panel C in Table 1).

Second, we measure 13F institutions' ESG preferences by examining the ESG score of their holdings. For each institution-quarter, we calculate the value-weighted average of size-adjusted ESG scores of all stocks in their quarterly holdings,

$$ESG_{j,q} = \sum_{i \in j} \omega_{i,q} ESG_i \tag{5}$$

where $ESG_{j,q}$ is the value-weighted ESG score for institution j at the end of quarter q, $\omega_{i,q}$ is the weight of stock i in institution j's portfolio at the end of quarter q, ESG_i is the size-adjusted ESG score for stock i at the precious year end. Stocks with missing ESG scores are removed in the calculation.

Third, we define ESG institutions. In each quarter, we sort all institutions into three groups based on the value-weighted ESG score, $ESG_{i,q}$, and the institutions in the top group are classified as ESG institutions. On average, 94 institutions are classified as ESG institutions, accounting for 19% of total 13F institutions, in each quarter.

Fourth, the stock level ESG institutional ownership is calculated as ratio of the shares held by ESG institutions to shares held by all institutions[6].

$$ESGIO_{i,q} = \frac{\text{\# of shares help by ESG institutions}}{\text{\# of shares held by all institutions}} \tag{6}$$

Thus, by construction, ESG institutional ownership indicates the relative importance of ESG institution to all institutions. On average, ESG institutions hold 8.5% of a stock, while institutions overall hold 70%, implying ESG institutions represent about 12.3% of total institutional ownership.

3.3 Control Variables

This study includes a number of stock characteristics associated with price informativeness. Dávila and Parlatore (2025) finds that stocks that are larger, have more volatile return, and trade more frequently have higher price informativeness. Accordingly, we include mar-

[6]We scale shares held by ESG institutions by shares held by all institution, rather than total shares outstanding, because of potentially confounding effects of variation in institutional ownership, as discussed by Cao et al. (2023).

ket capitalization ($MktCap$), book-to-market ratio (BM), return volatility ($TVol$), and turnover ($Turnover$) as control variables. The median market capitalization is $4,070 million, representing approximately the 70th percentile of Kenneth French's ME breakpoints, and the average BM ratio is 0.546, representing approximately the 55th percentile of Kenneth French's BE/ME breakpoints[7]. This implies that our results are not driven by small stocks. Additionally, we exclude stocks with prices lower than $5 from our sample. The mean return volatility is 9% and the mean quarterly turnover is 0.432 (See Panel C of Table 1).

[Insert Table 1 around here]

4 Empirical Results

4.1 Baseline Results

To study the relation between price informativeness and ESG institutional ownership, we estimate the following panel regression:

$$PI_{i,t} = \alpha + \beta_1 ESGIO_{i,t-1} + \beta_2 X_{i,t-1} + \epsilon_{i,t} \tag{7}$$

where $X_{i,t-1}$ is a vector composed of control variables, including IO, $ln(MktCap)$, $ln(BM)$, $TVol$, and $Turnover$. We use explanatory variables lagged by one period to reduce the potential effect of variation in price informativeness on contemporaneous explanatory variables and to allow some time for the market to process and reflect the information in prices. We also include stock and quarter fixed effects. The coefficient of interest is β_1. Since the proxy of price informativeness employed here refers to the uncertainty reduction about future earnings after observing the current stock prices, we expect β_1 to be positive.

Table 2 reports the results from the estimation of Equation 7. Column 1 presents the result without control variables but with fixed effects. β_1 is 0.012 and significant at 5% level, implying stocks that have higher ESG institutional ownership tend to have higher price informativeness. That is, for these stocks an external observer can learn more about future earnings from current stock prices. Column 2 includes control variables and the

[7]We obtain ME and BE/ME breakpoints on Kenneth French's website, available at Kenneth French Data Library. We calculate the average percentiles for ME and BE/ME over our sample period from 1996 to 2020. We obtain that the average 70th percentile ME breakpoint is $4,389 million, and the average 55th percentile of BE/ME breakpoint is 0.545. Note that market capitalization (ME) is highly right-skewed, so we compare our median market capitalization to Kenneth French's ME breakpoints.

coefficient increases, in terms of both magnitude and statistical significance. This indicates, after controlling for factors that affect price informativeness, the impact of ESG investing is stronger. Economically, one standard deviation increase in ESG institutional ownership will lead to a 1.5% increase in price informativeness relative to its unconditional mean[8]. In Column 3 and 4, we further add overall institutional ownership as an additional control variable, and our results preserve.

Note that ESG institutional ownership here is defined as the ratio of the shares held by ESG institution to the shares held by all institutions, hence it captures the relative importance of ESG institutions to overall 13F institutions. Our results suggest that, compared to typical institutional investors, ESG investors are more capable of improving the price informativeness of stock. We also use the raw ESG ownership ($ESGio$), which is the fraction of shares held by ESG institutions to total shares outstanding, the results remain similar (See Column 1 and 2 of Table A2). In addition, we instead measure the relative importance of ESG institutions as the proportion of ESG institutions over total number of institutions. Previous studies have documented that the number of institutions matter as well, for instance, Boehmer and Kelley (2009) and Cao et al. (2018) find a greater number of institutions leads to improvements in informational environment. The average proportion of ESG institution for sample stocks is 19.1%, which is slightly higher than relative ownership measure $ESGIO$. Again, the results remain both quantitatively and qualitatively similar[9].

Our results so far suggest higher ESG institutional ownership is associated with improved stock price informativeness. To further verify the rising influence of ESG investing on price informativeness, we split the full sample into two subsamples and repeat our baseline analysis. We designate 2004Q1 as cutoff point, this is because MSCI KLD database starts to include top 3000 U.S. firms and additionally Cao et al. (2023) find that ESG investing starts to grow prominently since then. Column 5 and 6 of Table 2 report the results. The coefficient on ESG institutional ownership is a significant 0.014 from 2004Q1 to 2020Q4, indicating the impact of ESG institutions holds. In contrast, we do not find significant results prior to this period. Our results here confirm the growing prominence of ESG investing and its positive impacts on stock price informativeness after 2003.

[Insert Table 2 around here]

[8] RPI has pooled mean and standard deviation equal to 0.097 and 0.115 respectively, and $ESGIO$ has a standard deviation equal to 0.085. Given the coefficient of 0.017, we have that one standard deviation increase in $ESGIO$ leads to 1.5%=0.017*0.085/0.097 increase in price informativeness.

[9] The mean and standard deviation of the proportion of ESG institutions are 0.191 and 0.072. Given the coefficient of 0.021, one standard deviation increase in proportion of ESG institutions leads to 1.6%=0.021*0.072/0.097 increase in price informativeness relative to its unconditional mean.

4.2 Heterogeneity Analysis on ESG Performance and ESG Disclosure Practice

Next, we investigate whether ESG performance itself and ESG disclosure practice play roles in the relation between ESG institutional ownership and stock price informativeness.

First, we investigate the impact of ESG performance on the relation between ESG institutional investors and stock price informativeness. Ng and Rezaee (2020) document a positive association between sustainability performance, captured by the sum of numbers of strengths and concerns covering different categories of ESG performance provided by MSCI KLD ESG database, and the price non-synchronicity. The price non-synchronicity is first introduced by Roll (1988) and widely used in literature (Blanco et al., 2024; Brogaard et al., 2022; Chen et al., 2007, among others) to gauge firm-specific information, and hence higher price non-synchronicity indicates a higher level firm-specific information content in stock price. Built upon this, we conjecture a substitution effect for ESG institutional investors, where their ownership tends to have a more pronounced impact on stocks with low ESG performance. ESG investors are naturally attracted by better ESG performance. However, higher ownership in low-ESG performance stocks may signal anticipated improvements in ESG and/or financial performance. This, in turn, tends to attract other investors to acquire and analyze information they think they may have previously overlooked. Thus, we expect a stronger relation between ESG ownership and price informativeness for low-ESG profile stocks.

In each quarter, we sort stocks based on the median of beginning-of-year size-adjusted ESG performance into two groups, and within each group we repeat our baseline analysis. In consideration of data availability and comparison convenience, for heterogeneity analysis on both ESG performance and disclosure, we take the sample since 2007Q1. Columns (1) to (3) of Table 3 present the results. Column (1) provides a benchmark, which is equivalent to our baseline result. Columns (2) and (3) present for Low- and High-ESG-Performance groups, respectively. We find a significant positive association between ESG ownership and price informativeness in the low ESG performance group, in line with our conjecture. We do not find significant relation from the high ESG performance group of stocks.

Second, we investigate the impact of ESG disclosure practice on the relation. The positive relation between ESG institutional ownership is justified by arguing that investors acquire and incorporate ESG-relevant information into stock prices. Thus, a natural expectation is that this relation will be stronger for stocks with better disclosure practices. Bushee and

Noe (2000) find that firms with higher AIMR disclosure rankings have higher institutional ownership, who rely on firms' disclosure to make informed investment decisions. In addition, focusing on climate change risk, Ilhan et al. (2023) document that investors have a strong demand for climate risk disclosures and they also actively engage their investee firms for improvements. Thus, with better ESG disclosure practices, investors can access more and high-quality ESG-related information and make more informed investment decisions, which in turn improve the price informativeness.

We retrieve the ESG disclosure score for our sample stocks from Bloomberg. Bloomberg's ESG disclosure scores range from 0 to 100, with higher scores indicating more comprehensive and detailed ESG disclosure. Then we sort stocks based on the median of beginning-of-year ESG disclosure score into two groups in each quarter, and repeat the baseline regression. Columns (4)-(6) of Table 3 present the results. Again, we first report a benchmark result for the sample of all stocks with ESG disclosure score. The positive relation between ESG institutional ownership preserves. Column (6) suggests that the relation is more significant for stock group with better ESG disclosure practice, consistent with our conjecture.

Overall, our findings suggest higher ESG institutional ownership is associated with improved stock price informativeness, and this impact is more pronounced within stocks that have weaker ESG performance and have better ESG disclosure practices.

[Insert Table 3 around here]

4.3 Robustness

As our first robustness check, we use alternative independent variables and dependent variables to repeat our baseline analysis. First, we use alternative ESG institutional ownership. Previous studies also use ESG institutional ownership constructed on ESG strength score (e.g., Hwang et al., 2022), or ESG net score (e.g., Cao et al., 2023; Yang et al., 2023), we follow and construct both raw and size-adjusted ESG institutional ownership. For brevity, we only report the coefficients of interest on ESG institutional ownership in Table 4. Column 1 presents our baseline results. Columns 2 and 3 report ESGIOs constructed using the strength and net scores, respectively, showing weaker but still significant evidence compared to the baseline. Columns 4 to 6 report results for raw ESG scores, revealing that ESG institutional ownerships based on raw scores have a significantly stronger impact on price informativeness. This suggests that our baseline results have accounted for and are not driven by size effects.

Second, we use alternative price informativeness measure, a welfare-based measure introduced by Bai et al. (2016), representing the predicted variation in future cash flows from current market prices. The price informativeness in year t at horizon h is given by $b_{t,h} \times \log(\frac{M}{A})$, which is the product of the forecasting coefficient $b_{t,h}$ in following cross-section regression and the standard deviation of the forecasting variable $\log(\frac{M}{A})$,

$$\frac{E_{i,t+h}}{A_{i,t}} = a_{t,h} + b_{t,h} \log\left(\frac{M_{i,t}}{A_{i,t}}\right) + c_{t,h}\left(\frac{E_{i,t}}{A_{i,t}}\right) + \epsilon_{i,t,h}, \tag{8}$$

where $E_{i,t}$, $A_{i,t}$, $M_{i,t}$ are earnings, total assets, and market capitalization respectively for stock i in year t, and $E_{i,t+h}$ is h-year-ahead earnings. As our focus is the contribution of ESG institutional ownership on price informativeness on the stock level, we follow Kacperczyk et al. (2021) and rely on following regression,

$$\frac{E_{i,t+h}}{A_{i,t}} = a + b_{1,h} \log\left(\frac{M_{i,t}}{A_{i,t}}\right) + b_{2,h} \log\left(\frac{M_{i,t}}{A_{i,t}}\right) \times ESGIO_{i,t} + X_{i,t} + \epsilon_{i,t,h}, \tag{9}$$

to infer the impact of $ESGIO$. $X_{i,t}$ is a vector composed of control variables applied in our baseline regression, as well as $\frac{E_{i,t}}{A_{i,t}}$. The coefficient of interest, $b_{2,h}$, measures the average PI conditional on ESG institutional ownership. To be consistent with our baseline result, $b_{2,h}$ should be significantly positive. Table 5 confirms this expectation. In both 1-year and 3-year horizons, the coefficients of the interaction term are significantly positive, indicating that greater ESG institutional ownership increases stock price informativeness.

[Insert Table 4 around here]

[Insert Table 5 around here]

5 Channel Analysis

5.1 Improved Information Environment

Financial markets play an important role of aggregating different sources of information about fundamentals (Dávila & Parlatore, 2025). Asset prices aggregate information from different market participants, who trade based on their own informative signals for profit motives. The aggregation of these signals in turn makes asset prices itslef an important and powerful source of information. This is referred to as feedback effect (Edmans et al., 2015;

Goldstein, 2023; Goldstein et al., 2024). The process of feedback effect relies on information acquisition and dissemination. As the scope of ESG investing grows over the past decade, we expect more motivated activities on information acquisition and analysis, in terms of both ESG-relevant information and conventional finanicial information, from investors, and hence the overall information environment is improving.

We, in this section, investigate whether the improved information environment for stocks held more by ESG institutions is a channel through which ESG institutional investors improves the price informativeness. Specifically, we consider two sources of information acquisition and dissemination, namely information acquisition via Electronic Data Gathering, Analysis, and Retrieval (EDGAR), and analyst coverage. Additionally, we explore the natural outcomes of increased information acquisition, including a rise in informed trading and a corresponding decline in noise trading.

5.1.1 Information Acquisition from EDGAR

The effectiveness of information incorporation into stock price relies on the actual use of information (Drake et al., 2015; Lev, 1989). On the one hand, investors have to balance between marginal benefit and cost to acquire and analyze firm disclosures. That is, to acquire and process information, investors expect competitive returns for doing so. The implementation of EDGAR system, which hosts all mandatory filings by listed companies, in 1993 largely reduces the information processing cost for investors (Goldstein et al., 2023). Investors can hence more frequently and freely access the mandatory disclosures to inform their trading decisions (Chen et al., 2020a; Drake et al., 2015; Landsman et al., 2024, among others).

On the other hand, investors are incentivized to acquire information upon the arrival of new information (Kim & Verrecchia, 1997). In the age of ESG investing, ESG investors are motivated to acquire more information, especially disclosures on ESG practices, to make screening and investing decisions. Meanwhile, traditional investors are also likely to seek information to update their knowledge and assess the potential impact of ESG investing on their portfolios. Thus, we expect an increase of information acquisition via EDGAR for stocks held more by ESG investors. This aligns with Avramov et al. (2024)'s model, which highlights how ESG investing amplifies information acquisition within the mutual fund industry.

We rely on the log file of EDGAR to gauge the search volume on sample stocks. The

log file records all activity performed by users on EDGAR, with each log entry records the requester's unique IP address, the firm being queried, the request's timestamp, and the type and date of the requested filing[10]. We aggregate the daily non-robust search volume for each stock in each quarter to have quarterly measure of information activities ($EDGAR$)[11]. To examine the the relation between EDGAR search volume and ESG ownership, we estimate the following regression:

$$EDGAR_t = \alpha + \beta_1 ESGIO_{i,t-1} + \beta_2 X_{i,t-1} + \epsilon_{i,t}, \tag{10}$$

where $X_{i,t-1}$ is a set of control variables, including $ln(MktCap)$, $ln(BM)$, $IVol$, $Turnover$, IO, $Leverage$, as well as one-quarter lagged $EDGAR$ controlling for persistence of information acquisition via EDGAR.

Columns 1 and 2 of Table 6 report the result. Column 1 reveals that higher ESG ownership is indeed associated with higher EDGAR search volume, even after controlling for firm characteristics are related to EDGAR search volume (Drake et al., 2015), consistent with our hypothesis that ESG investing motivate information acquisition. Specifically, one standard deviation increase in ESG ownership leads to an additional 248 search activities[12]. We further control for the persistence of search volume, though the coefficient reduces to 0.45, but our result stays significant at 1%.

[Insert Table 6 around here]

5.1.2 Analyst Coverage

Analyst coverage is another important source of information for investors. Analysts acquire and process information to provide forecasts, playing a key role in information dissemination (Beyer et al., 2010; Gibbons et al., 2021; Harford et al., 2019, among others) and improving stock price informativeness. In addition, analyst coverage is regarded a complementary source of information to raw information disclosures. For example, Gibbons et al. (2021) demonstrate analysts rely on EDGAR in 24% of their estimate updates, implying that analysts supplement the raw data obtained from EDGAR filings with independent sources of

[10]For more detailed discussion on EDGAR log file, please refer to Drake et al. (2015), Loughran and McDonald (2017), and Ryans (2017).

[11]We thank Ryans (2017) generously making EDGAR search volume data publicly available, which can be accessed by request here http://www.jamesryans.com/.

[12]The pooled standard derivation of ESG ownership is 0.086, and the beta coefficient is 2.801, so one standard deviation increase in ESG ownership leads to 0.086*2.801*1,000 = 248 increase in search activities.

information and their own expertise and hence generate private information.

Analysts, as important players of aggregating and producing information, are incentivized by both investor demand for information and their own career concerns (Beyer et al., 2010; Harford et al., 2019). With the growing prominence of ESG investing, the demand for ESG-related information from investors, mutual funds for instance, is expected to rise. Hartzmark and Sussman (2019) document that investors marketwide value sustainability, with mutual funds categorized as high sustainability receiving net inflows exceeding $24 billion. Consequently, this heightened focus on sustainability is likely to incentivize analysts to produce more ESG-relevant information. Furthermore, driven by career concerns, analysts may adapt to the trend by increasing their coverage of stocks with strong ESG performance and incorporating more ESG considerations into their analysis reports. Thus, we expect higher ESG ownership is associated with increased analyst coverage.

To estimate the impact, we replace $EDGAR$ with $lnAnalyst$ as dependent variable in Equation 10, and repeat the regression. Column 3 and 4 of Table 6 reports the result. The coefficient on ESG ownership is 0.193, significant at 1% level. Economically, one standard deviation increase in ESG ownership leads to 1.67% increase in analyst coverage[13]. After controlling for the persistence of analyst coverage, our result, though weaker, still holds.

5.1.3 More Informed Trading and Less Noise Tarding

A natural consequence of more information acquisition and dissemination is increased informed trading and reduced noise trading. First, relying on probability of informed trading (PIN), we investigate whether stocks held more by ESG institutions have higher PIN. PIN was developed and used in a series of studies by Easley et al. (1996), Easley et al. (1997), Easley et al. (1998), and Easley et al. (2002), and widely used in literature on the information content in stock prices (Blanco et al., 2024; Chen et al., 2007, among others). It is constructed based on a micro-structural model in which trades come from noise trader and informed traders, and it measures the probability of informed trading who trade on their private information. PIN hence reflect the private information contained stock prices and higher PIN implies higher price informativeness. Column (5) of Table 7 reports the results of regression on PIN on $ESGIO$. The coefficient on $ESGIO$ is a significant 0.019, indicating that one standard deviation increase in ESG institutional ownership is associated

[13]The pooled standard derivation of ESG ownership is 0.086, and the beta coefficient is 0.193, so one standard deviation increase in ESG ownership leads to $e^{0.193*0.086} - 1 = 1.67\%$ increase in analyst coverage.

with 1.47% increase in probability of informed trading relative to its unconditional mean[14].

In addition, if ESG institutions are more informed due to improved information environment, we should expect their trading activities are positively related to price informativeness. We replace the independent variable in our baseline regression with ESG institutional trading proxy variables and estimate the impact. Our trading proxy of interest is the absolute change in quarterly holdings of ESG institutions, but we also look at the buy and sell activities. Table 7 presents the results. Column 4 reports for aggregate trade by ESG institutions. The coefficient is positive as 0.078, significant at 1% level. Thus, our conjecture is confirmed that trading by ESG institutions are informed and improve the price informativeness. By examining buying (sum of increase in ESG institutions' holdings) and selling activities (sum of decrease in ESG institutions' holdings) separately, we find compared to selling, buying of ESG institutions are associated with improved price informativeness. Last, we do not predict the direction for the relation between net change of quarterly ESG holdings and price informativeness, and also we observe an insignificant positive relation, presented in Column 1.

Second, faced with improved information environment, noise trading is expected to reduce. Noise trading, the trading based on erroneous beliefs about fundamentals by irrational investors, tend to drag stock price to deviate from the informationally efficient levels, creating noise trader risk (Brown, 1999; DeLong et al., 1990). The collective noise in the market can be proxied by investor sentiment, constructed by Baker and Wurgler (2006, 2007) and widely used in literature (e.g., Chen et al., 2021; DeVault et al., 2019; Stambaugh et al., 2012, 2015). we rely on sentiment beta to measure the firm-level sentiment. It captures the sensitive of stock return to the change in marketwide investor sentiment (Baker & Wurgler, 2007; Glushkov, 2006; Massa & Yadav, 2015), and can be estimated in asset pricing models, e.g., Fama and French (1993) 3-factor model, by adding the change in sentiment as the factor of interest. If a stock has high sentiment beta, its return is more driven by investor sentiment and hence is less informative.

Thus, we should expect higher ESG institutional ownership is associated with reduced sentiment beta. Table 8 reports the result. The coefficient on ESGIO in Column 1 is -0.138, significant at 1% level, indicating that stocks held more by ESG institutions tend to have lower sentiment beta, that said, their stock price is less driven by investor sentiment but reflect more information. After controlling for persistence of sentiment beta, though the coefficient and its significance reduce, the negative relation preserves.

[14]The pooled standard deviation of $ESGIO$ is 0.085, and the pooled mean of PIN is 0.11, so one standard deviation in $ESGIO$ is associated with 1.47%=0.019*0.085/0.11 increase in PIN relative to its mean.

[Insert Table 7 around here]

[Insert Table 8 around here]

5.1.4 Summary

Overall, our findings in this section reveals that improved information environment is one plausible channel through which ESG investing enhances price informativeness. Stock held more by ESG institutions attract more information acquisition and dissemination, supported by the evidence that higher ESG ownership is associated with increased EDGAR search volume and increased analyst coverage. Consequently, improved information environment enables more informed trading and less noise trading, both of which leads to improved price informativeness.

5.2 Long-term ESG Engagement

ESG engagement is another potential channel through which ESG investing improves the stock price informativeness. ESG engagement refers to ESG investors' interaction with investee firm to encourage sustainable practices within the firm, enhancing long-term performance (Roncalli, 2022). In addition, ESG engagement at least serve as an insurance mechanism of company' operation and its profit against risk-inducing incidents, as well as unfavourable regulation, legislative, or consumer actions against the companies (Dyck et al., 2019; Hoepner et al., 2023). As such, the long-term performance of the firm is more stable and sustainable, enabling investors to face less uncertainty when they attempt to predict firm's future performance (Derrien et al., 2023). Hence, the relation between current stock price and future earnings is strengthened, that is, the stock price informativeness about future earnings is stronger.

To ascertain the feasibility of ESG engagement channel, we examine whether the positive relation between ESG ownership and stock price informativeness is more driven by short-term or longer-term ESG institutions. We expect long-term ESG institutional ownership to be more relevant. First, short-term investors are less incentivized to engage or monitor the firm but are more likely to force managers to focus on short term. However, long-term investors stay closer with the firm for a long horizon and are more likely to engage with the firm for sustainable profits. Additionally, they are better equipped to analyze ESG-related projects with longer-term payoffs (Starks et al., 2017). Second, sustainable practice is in

general future-oriented and hence it takes time to realize profits and its impact (Derrien et al., 2023; Khan et al., 2016; Serafeim & Yoon, 2022), so the investment horizon of long-term ESG investors more align with the life of ESG projects.

We follow Bushee and Noe (2000), further categorizing ESG institutions based on their investor horizon, measured by portfolio turnover, into long- and short-term ESG institutions. Their method also considers the portfolio diversification of institutional investors, which is beneficial for our study on ESG investing, as long-term institutional investors do not necessarily actively engage in a firm's project decisions. Institutions with high portfolio diversification is more likely to be passive investors who own shares in the company but have no intention of influencing the company, while low-diversification institutions are dedicated and actively engage with firm's operations. Thus, based on ESG institutions' portfolio turnover and diversification, we further categorize into: transient (TRA) who have both high turnover and diversification, quasi-indexer (QIX) who have low turnover but high diversification, and dedicated (DED) who have both low turnover and diversification. Dedicated ESG institutions are hence long-term activists, while quasi-indexer ESG institutions are long-term passive investors. We expect the ownership of both types to be positively associated with stock price informativeness, with dedicated ESG ownership exhibiting a stronger relation.

Table 9 presents the results. Column (1) reports the baseline result for comparison. Column (2) and (3) include dedicated and quasi-indexer ESG ownership as independent variables, respectively, while Column (4) reports for transient ESG ownership. The result is consistent with our conjecture that dedicated and quasi-indexer ESG institutions improve the price informativeness, evidenced from significant positive coefficients in Column (2) and (3). In Column (5) where we include all three types of ownership, the significance of quasi-indexer ESG ownership disappear while the significance and level of dedicated ESG investors preserve. In addition, we find significant negative relation between transient ESG ownership and stock price informativeness, which suggest that short-term ESG speculators do not help improve the price informativeness.

Overall, our findings suggest long-term ESG engagement is one plausible channel through which ESG investing improves the stock price informativeness about future earnings. By closely staying with the firm and engaging in operations to encourage sustainable practices, ESG investing fosters the interlink between financial performance and ESG performance and facilitates the mutual reinforcement effect of two (e.g., Edmans (2024) and Edmans et al. (2024a)), leading to higher stock price informativeness.

[Insert Table 9 around here]

6 Conclusion

This study empirically examines the impact of ESG investing on stock price informativeness. Two recent theoretical studies present contrasting predictions on the relation. While Goldstein et al. (2024) demonstrate that trades by ESG investors, who emphasize ESG performance information, incorporate more ESG information into stock prices, thereby reducing their informativeness about financial performance, Avramov et al. (2024) argue that ESG investing incentivizes targeted information acquisition, enhancing stock price informativeness, particularly for stocks with significant departures from green neutrality and heterogeneous ESG preferences.

Our findings are consistent with Avramov et al. (2024)'s model prediction. Specifically, our findings reveal that higher ESG institutional ownership is associated with enhanced stock price informativeness, with one standard deviation increase in ESG institutional ownership leading to a 1.5% increase in price informativeness relative to its unconditional mean. Our results remain robust using alternative proxy variables for both dependent and independent variables. In addition, findings of the heterogeneity analysis reveal that this positive association is more pronounced when stocks have lower ESG performance and better ESG disclosure practices.

Further analyses indicate that an improved information environment for the firm and ESG institutions' engagement with the firm may be two channels through which ESG investing enhances stock price informativeness. First, ESG investing compels green investors to acquire ESG-related information, while traditional investors must update their knowledge of their holdings. As a result, more information is acquired and processed, leading to more informative stock prices. Consistent with this notion, our findings reveal that higher ESG institutional ownership is associated with increased EDGAR search volume and greater analyst coverage. Consequently, these stocks experience more informed trading and less noise trading.

Second, ESG engagement, through promoting sustainable practices and mitigating risks from incidents or unfavorable actions, enhances firm stability and reduces uncertainty in predicting future performance, thereby strengthening the relation between current stock prices and future earnings and improving stock price informativeness. Consistent with this notion,

our findings reveal that the positive relationship between ESG ownership and stock price informativeness is primarily driven by long-term ESG institutional investors, particularly those with low portfolio turnover and diversification, as they are more likely to actively engage with firms and align their investment horizon with the lifecycle of ESG projects, enhancing sustainable profits and price informativeness.

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Tables

Table 1: Descriptive Statistics

This table reports the summary statistics, covering the sample period from 1996Q1 to 2020Q4. Pane A reports for stock price informativeness variables. PI is the price informativeness measure constructed following Dávila and Parlatore (2025), implying the uncertainty reduction about future earnings (i.e. EBIT) after observing current stock prices. PIN is Probability of Informed Trading, developed by Easley et al. (1998, 2002), capturing the amount of private information in stock prices brought up by informed trading. Panel B reports for institutional ownership variables. $ESGio$ is the ownership of ESG institutions, the fraction of shares held by ESG institutions to total shares outstanding. IO is the total 13F institutional ownership, the fraction of shares held by all 13F institutions to total shares outstanding. $ESGIO$ is our proxy for ESG institutional ownership, the fraction of shares held by ESG institutions to shares held by all 13F institutions, capturing the relative importance of ESG investors. $ESG\ Insts(No.)$ and $ESG\ Insts(\%)$ are the number of ESG institutions and the ratio of the number of ESG institutions to the total number of 13F institutions, respectively. Panel C reports for ESG performance. ESG and ESG_Adj refer to raw and size-adjusted MSCI KLD ESG scores, respectively. The ESG score is constructed by adding strengths and subtracting concerns across seven categories, with strengths (concerns) scaled by the maximum number of strengths (concerns) possible for each category (Hwang et al., 2022; Lins et al., 2017). Panel D reports for stock characteristics. $EBIT$ is the earnings before interest and taxes, $Assets$ is the book value of total assets, and $MktCap$ is the market capitalization. $\frac{E}{A}$ is the ratio of EBIT to total assets, and $lnMA$ is the natural logarithm of the ratio of market capitalization to total assets. $Price$ is the quarter-end adjusted closing price, BM is the book-to-market ratio, the ratio of book value to the market value of equity. $IVol$ and $TVol$ are idiosyncratic volatility and total volatility, respectively, calculated based on the prior 36-month return series.

Variables	N	Mean	Std	Min	25%	50%	75%	Max
Panel A: Price Informativeness								
PI	51,388	0.093	0.108	0.000	0.012	0.052	0.137	0.483
PIN	19,403	0.114	0.049	0.033	0.082	0.105	0.135	0.293
Panel B: Institutional Ownerships								
$ESGIO$	51,388	0.123	0.085	0.009	0.059	0.106	0.168	0.423
$ESG\ Insts(No.)$	51,388	94.226	118.965	6.140	24.415	47.125	107.640	586.670
$ESG\ Insts(\%)$	51,388	0.191	0.072	0.075	0.137	0.176	0.234	0.369
$ESGio$	51,388	0.085	0.061	0.004	0.038	0.072	0.116	0.297
IO	51,388	0.696	0.171	0.208	0.595	0.727	0.826	0.961
Panel C: MSCI KLD ESG Performances								
ESG	51,388	0.101	0.671	-1.299	-0.321	0.009	0.453	2.103
ESG_Adj	51,388	0.005	0.607	-1.492	-0.352	-0.039	0.343	1.769
Panel D: Stock Characteristics								
$EBIT(\$M)$	51,138	362	852	-193	36	99	291	5,812
$Assets(\$M)$	51,373	21,755	58,028	184	1,778	5,022	15,746	424,901
$MktCap(\$M)$	51,388	14,874	32,421	212	1,673	4,070	11,333	206,034
$E_{i,t}/A_{i,t}$	51,131	0.096	0.084	-0.145	0.040	0.085	0.139	0.367
$E_{i,t+1}/A_{i,t}$	44,097	0.107	0.093	-0.130	0.044	0.092	0.153	0.430
$E_{i,t+2}/A_{i,t}$	39,534	0.118	0.105	-0.127	0.045	0.098	0.166	0.497
$E_{i,t+3}/A_{i,t}$	35,639	0.128	0.118	-0.121	0.048	0.103	0.179	0.582
$lnMA$	51,370	-0.212	1.018	-2.649	-0.846	-0.126	0.499	1.895
$Price$	51,388	40.162	32.362	6.326	19.303	31.639	50.215	197.292
BM	51,145	0.546	0.347	0.059	0.285	0.476	0.733	1.751
$IVol$	51,388	0.077	0.030	0.034	0.055	0.070	0.091	0.184
$TVol$	51,388	0.090	0.035	0.040	0.066	0.083	0.106	0.215
$Turnover$	51,388	0.432	0.302	0.075	0.246	0.352	0.519	1.861

Table 2: Regression of Price Informativeness on ESG Institutional Ownership

This table reports the estimates from the panel regression of price informativeness (PI) on ESG institutional ownership ($ESGIO$) over the sample period from 1996Q1 to 2020Q4. Control variables include institutional ownership (IO), market capitalization ($ln(MktCap)$), book-to-market ratio ($ln(BM)$), idiosyncratic volatility ($IVol$), quarterly turnover ($Turnover$), and analyst coverage ($lnAnalyst$). The regressions also include both stock- and quarter-fixed effects. All explanatory variables are lagged by one quarter. T-statistics are reported in parentheses, with *, **, and *** denoting statistical significance at the 10%, 5%, and 1% levels, respectively. Columns 1 to 4 present regression results based on the full sample. Since the MSCI KLD database began covering the top 3,000 U.S. firms and assets devoted to ESG investing started accelerating around 2004 (see, e.g., Cao et al. (2023)), we also conduct subsample analyses to examine the growing influence of ESG investing on price informativeness. Columns 5 and 6 report the regression results for the subsamples spanning 1996Q1–2003Q4 and 2004Q1–2020Q4, respectively.

	Full Sample: 1996Q1-2020Q4				1996Q1-2003Q4	2004Q1-2020Q4
	(1)	(2)	(3)	(4)	(5)	(6)
$ESGIO_{i,t-1}$	0.015***	0.015***	0.015***	0.016***	-0.008	0.016***
	(2.78)	(2.73)	(2.74)	(2.75)	(-0.58)	(2.69)
$IO_{i,t-1}$			-0.005	-0.027***	-0.001	-0.024***
			(-0.87)	(-4.30)	(-0.08)	(-3.54)
$lnMktCap_{i,t-1}$		0.012***		0.012***	-0.011***	0.015***
		(9.57)		(9.90)	(-2.75)	(10.89)
$lnBM_{i,t-1}$		0.007***		0.008***	0.004	0.007***
		(6.06)		(6.34)	(0.97)	(5.22)
$IVol_{i,t-1}$		0.092***		0.084***	0.148**	0.099***
		(4.44)		(4.03)	(2.11)	(4.64)
$Turnover_{i,t-1}$		0.007***		0.009***	0.012***	0.008***
		(6.20)		(7.17)	(3.90)	(5.94)
$lnAnalyst_{i,t-1}$		0.015***		0.016***	0.003	0.013***
		(12.52)		(12.77)	(0.47)	(10.18)
Stock FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj R2	0.514	0.520	0.514	0.521	0.664	0.558
Obs.	54,949	52,606	54,949	52,606	5,190	47,412

Table 3: Heterogeneity Analysis on ESG Performance and ESG Disclosure

This table reports for heterogeneity analysis assessing how ESG performance and ESG disclosure influence the relation between price informativeness (PI) and ESG institutional ownership ($ESGIO$). All control variables are the same as those in Table 2. In each quarter, stocks are sorted into two groups based on beginning-of-year ESG performance (Panel A) or ESG disclosure (Panel B), and then within each low- and high-ESG performance (or ESG disclosure) group we repeat the estimation of the baseline regression. The analysis is conducted using the sample period from 2007Q1 to 2020Q4, chosen to align with the availability of ESG performance and disclosure data. Columns 1 and 4 report regression results for the full sample within this period. These results confirm the robustness of the baseline findings with broader sample coverage and serve as a benchmark for comparison with the subsample regressions. T-statistics are reported in parentheses, *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	Panel A: ESG Score Sorting			***Panel B: ESG Disclosure Sorting***		
	Overall	Low	High	Overall	Low	High
	(1)	(2)	(3)	(4)	(5)	(6)
$ESGIO_{i,t-1}$	0.019***	0.048***	-0.003	0.015*	-0.006	0.029**
	(2.70)	(4.58)	(-0.27)	(1.77)	(-0.50)	(2.22)
$IO_{i,t-1}$	-0.023***	-0.050***	-0.012	-0.026***	0.002	-0.014
	(-2.87)	(-4.47)	(-0.99)	(-2.70)	(0.15)	(-0.94)
$lnMktCap_{i,t-1}$	0.017***	0.024***	0.008***	0.023***	0.011***	0.028***
	(10.60)	(9.87)	(3.17)	(12.17)	(4.07)	(9.57)
$lnBM_{i,t-1}$	0.007***	0.012***	0.002	0.012***	-0.002	0.019***
	(4.46)	(5.56)	(0.80)	(6.94)	(-0.87)	(7.75)
$IVol_{i,t-1}$	0.104***	0.168***	0.080**	0.139***	0.130***	0.132***
	(4.45)	(5.00)	(2.29)	(5.22)	(3.66)	(3.38)
$Turnover_{i,t-1}$	0.008***	0.010***	0.006***	0.008***	0.001	0.013***
	(5.70)	(5.38)	(2.92)	(4.87)	(0.44)	(5.31)
$lnAnalyst_{i,t-1}$	0.011***	0.008***	0.015***	0.010***	0.008***	0.017***
	(7.86)	(3.71)	(7.43)	(6.15)	(4.03)	(5.52)
Stock FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj R2	0.603	0.655	0.637	0.639	0.643	0.687
Obs.	41,602	21,173	20,411	31,256	15,272	15,950

Table 4: Robustness of Different ESGIOs

This table reports the results of robustness analysis using alternative measures of ESG institutional ownership ($ESGIO$). All control variables are the same as those in Table 2. Baseline ESG institutional ownership is defined as ownership held by ESG institutions, identified using the size-adjusted net scaled MSCI ESG score, calculated as the ratio of strengths to maximum strengths minus the ratio of concerns to maximum concerns across 7 categories including community, corporate governance, diversity, employee relations, environment, human rights, and product issues. In this analysis, an institution's ESG preference is measured using four alternative approaches: (1) the raw net scaled ESG score; (2) the strength score, calculated as the total number of strengths; (3) the net score, calculated as the total number of strengths minus the total number of concerns; (4) the size-adjusted strength score; and (5) the size-adjusted net score. Based on these alternative measures, the corresponding $ESGIO$s are computed. Panel A reports the results for $ESGIO$ constructed using size-adjusted ESG score measures, with Column 1 presenting the baseline result for comparison. Panel B presents the results for $ESGIO$ constructed using the raw ESG score measures. T-statistics are reported in parentheses, *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	Panel A: Size-Adjusted ESG Score			**Panel B: Raw ESG Score**		
	Net Scaled	Net	Strength	Net Scaled	Net	Strength
	(1)	(2)	(3)	(4)	(5)	(6)
$ESGIO_{i,t-1}$	0.017***	0.016**	0.011*	0.031***	0.029***	0.020***
	(3.01)	(2.54)	(1.76)	(5.86)	(4.25)	(2.95)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Stock FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj R2	0.522	0.522	0.522	0.523	0.522	0.522
Obs	48,732	48,732	48,732	48,732	48,732	48,732

Table 5: Regression of Bai's Price Informativeness on ESG Institutional Ownership

This table reports the results of robustness analysis using alternative price informativeness, i.e., Bai et al. (2016)'s welfare-based price informativeness. Specifically, in regression, the dependent variable (E/A) is the ratio of earnings before interest and taxes (EBIT) at quarter $t+1$ or $t+3$ to total assets at quarter t, and the independent variable ($lnMA$) is the natural logarithm of the ratio of market capitalization to total assets. The coefficient of the interaction term $lnMA_{i,t} \times ESGIO_{i,t}$ is of interest, measuring average price informativeness, defined as a sensitivity of future earnings to current stock prices, conditional on ESG institutional ownership (See, e.g., Bai et al. (2016) and Kacperczyk et al. (2021)). Columns 1 to 4 present the results for the 1-quarter prediction horizon and Columns 5-8 present for 3-quarter prediction horizon. T-statistics are reported in parentheses, *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	$E_{i,t+1}/A_t$				$E_{i,t+3}/A_t$			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$lnMA_{i,t}$	0.067***	0.073***	0.022***	0.032***	0.059***	0.079***	0.002	-0.013*
	(72.59)	(32.32)	(10.67)	(7.69)	(41.66)	(23.44)	(0.62)	(-1.83)
$ESGIO_{i,t}$	-0.008*	-0.009**	-0.010**	-0.010***	0.005	0.002	-0.013**	-0.017***
	(-1.73)	(-2.06)	(-2.57)	(-2.80)	(0.83)	(0.30)	(-2.27)	(-2.84)
$lnMA_{i,t} \times ESGIO_{i,t}$	**0.025*** **	**0.024*** **	**0.012*** **	**0.007** **	**0.056*** **	**0.052*** **	**0.029*** **	**0.018*** **
	(6.81)	**(6.55)**	**(3.96)**	**(2.31)**	**(10.54)**	**(9.82)**	**(5.96)**	**(3.57)**
$IO_{i,t}$		-0.020***	0.005	0.007*		-0.023***	0.031***	0.034***
		(-4.39)	(1.32)	(1.70)		(-3.32)	(4.80)	(5.33)
$lnMA_{i,t} \times IO_{i,t}$		-0.008***	-0.002	-0.000		-0.028***	-0.004	0.003
		(-2.74)	(-1.03)	(-0.09)		(-6.57)	(-0.98)	(0.80)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Stock FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj R2	0.646	0.646	0.749	0.751	0.599	0.599	0.667	0.669
Obs	42,264	42,264	41,968	41,968	34,117	34,117	33,890	33,890

Table 6: Information Acquisition Channel Analysis

This table reports the estimates from the panel regression of information acquisition proxies, EDGAR search column ($EDGAR$) and analyst coverage ($Analyst$), on ESG institutional ownership ($ESGIO$). Control variables include institutional ownership (IO), market capitalization ($ln(MktCap)$), book-to-market ratio ($ln(BM)$), idiosyncratic volatility ($IVol$), quarterly turnover ($Turnover$), and leverage ($Leverage$). All regression models include both stock- and quarter-fixed effects. Columns 1 and 2 present for EDGAR search volume, and Columns 3 and 4 present for analyst coverage. Column 2 (4) includes lagged EDGAR search volume (analyst coverage) to account for the persistence of information acquisition activities. T-statistics are reported in parentheses, *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	$EDGAR_t$		$lnAnalyst_t$	
	(1)	(2)	(3)	(4)
$ESGIO_{i,t-1}$	2.801***	0.450***	0.193***	0.021*
	(18.87)	(5.64)	(8.54)	(1.82)
$lnMktCap_{i,t-1}$	0.289***	0.039**	0.310***	0.059***
	(6.69)	(1.99)	(65.75)	(23.75)
$lnBM_{i,t-1}$	0.303***	0.027	0.104***	0.004*
	(7.14)	(1.40)	(22.67)	(1.90)
$IVol_{i,t-1}$	2.249***	-0.154	-0.461***	-0.000
	(5.30)	(-0.64)	(-5.31)	(-0.01)
$Turnover_{i,t-1}$	0.253***	-0.059***	0.104***	0.022***
	(7.50)	(-3.23)	(21.04)	(8.76)
$IO_{i,t-1}$	-1.972***	-0.177**	0.231***	0.027**
	(-13.51)	(-2.50)	(9.63)	(2.15)
$Leverage_{i,t-1}$	2.846***	0.304***	0.218***	0.026***
	(15.55)	(3.68)	(11.10)	(2.71)
$EDGAR_{i,t-1}$		0.001***		
		(59.15)		
$lnAnalyst_{i,t-1}$				0.838***
				(217.88)
Stock FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Adj R2	0.720	0.933	0.873	0.964
Obs.	34,732	34,380	50,186	50,021

Table 7: Informed Trading Regressions

This table reports the results of informed trading. Columns 1 to 4 present the estimates from the panel regression of price informativeness (PI) on ESG institutional trading variables, Column 5 presents for the regression of the probability of informed trading on ESG institutional ownership. All control variables are the same as those in baseline regression presented in Table 2, and all regression models include both stock- and quarter-fixed effects. T-statistics are reported in parentheses, *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	PI_{it}				PIN_{it}
	(1)	(2)	(3)	(4)	(5)
$ESGIO_{i,t-1}$					0.019***
					(5.48)
$ESGio\_Change_{i,t-1}$	0.011				
	(0.41)				
$ESGio\_Buy_{i,t-1}$		0.085**			
		(2.44)			
$ESGio\_Sell_{i,t-1}$			-0.080**		
			(-1.98)		
$ESGio\_Trade_{i,t-1}$				0.078***	
				(3.08)	
$IO_{i,t-1}$	-0.027***	-0.028***	-0.027***	-0.028***	-0.029***
	(-4.28)	(-4.43)	(-4.27)	(-4.42)	(-7.65)
$lnMktCap_{i,t-1}$	0.012***	0.012***	0.012***	0.012***	-0.016***
	(9.73)	(9.81)	(9.80)	(9.87)	(-21.40)
$lnBM_{i,t-1}$	0.008***	0.008***	0.008***	0.008***	-0.001*
	(6.29)	(6.29)	(6.24)	(6.25)	(-1.67)
$IVol_{i,t-1}$	0.081***	0.082***	0.082***	0.083***	-0.102***
	(3.91)	(3.97)	(3.96)	(4.02)	(-8.99)
$Turnover_{i,t-1}$	0.009***	0.008***	0.008***	0.007***	-0.013***
	(7.16)	(6.40)	(6.49)	(5.82)	(-17.35)
$Analyst_{i,t-1}$	0.016***	0.016***	0.016***	0.016***	-0.005***
	(12.90)	(12.88)	(12.85)	(12.84)	(-5.84)
Stock FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Adj. R2	0.521	0.521	0.521	0.521	0.709
Obs.	52,607	52,607	52,607	52,607	19,594

Table 8: Regression of Sentiment Beta on ESG institutional Ownership

This table reports the estimates from the panel regression of sentiment beta (Baker & Wurgler, 2007; Chen et al., 2021; Glushkov, 2006, among others) on ESG institutional ownership. All control variables are the same as those in baseline regression presented in Table 2, and all regression models include both stock- and quarter-fixed effects. Column 2 also includes the lagged sentiment beta to account for the persistence pattern in sentiment beta. T-statistics are reported in parentheses, *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	DepVar: $SentBeta_{it}$	
	(1)	(2)
$ESGIO_{i,t-1}$	-0.138***	-0.062**
	(-3.48)	(-2.23)
$SentBeta_{i,t-1}$		70.925***
		(149.01)
$lnMktCap_{i,t-1}$	0.021**	-0.005
	(2.30)	(-0.72)
$lnBM_{i,t-1}$	0.008	0.002
	(0.89)	(0.29)
$IVol_{i,t-1}$	8.334***	1.897***
	(42.24)	(14.12)
$Turnover_{i,t-1}$	0.021**	0.020***
	(2.22)	(2.96)
$lnAnalyst_{i,t-1}$	-0.066***	-0.021***
	(-7.10)	(-3.11)
$IO_{i,t-1}$	-0.046	-0.028
	(-1.02)	(-0.92)
Stock FE	Yes	Yes
Time FE	Yes	Yes
Adj R2	0.669	0.833
Obs.	51,696	51,476

Table 9: Regression of PI on ESGIO: ESG Engagement Channel Analysis

This table reports the estimates from the regressions of price informativeness (PI) on three types of ESG institutional ownerships. Columns 2 to 4 present for dedicated, quasi-indexer, and transient ESG institutional ownerships, respectively; and Column 5 include all three types of ownership. All control variables are the same as those in baseline regression presented in Table 2, and all regression models include both stock- and quarter-fixed effects. T-statistics are reported in parentheses, *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	DepVar: Price Informativeness				
	(1)	(2)	(3)	(4)	(5)
ESGio	0.021***				
	(2.75)				
ESGio_DED		0.052**			0.052**
		(2.05)			(2.06)
ESGio_QIX			0.025***		0.014
			(2.58)		(0.89)
ESGio_TRA				-0.078***	-0.098***
				(-2.90)	(-2.60)
IO	-0.029***	-0.032***	-0.029***	-0.023***	-0.030***
	(-4.64)	(-2.97)	(-4.54)	(-3.62)	(-2.76)
lnMktCap	0.013***	0.010***	0.012***	0.012***	0.010***
	(9.93)	(4.63)	(9.87)	(9.56)	(4.89)
lnBM	0.008***	0.010***	0.008***	0.007***	0.009***
	(6.30)	(4.95)	(6.20)	(5.96)	(4.57)
Ivol	0.084***	0.090**	0.084***	0.078***	0.089**
	(4.03)	(2.44)	(4.03)	(3.67)	(2.40)
Turnover	0.009***	0.007***	0.009***	0.009***	0.008***
	(7.13)	(3.78)	(7.15)	(7.26)	(4.32)
lnAnalyst	0.016***	0.023***	0.016***	0.016***	0.023***
	(12.75)	(10.65)	(12.67)	(12.80)	(10.37)
Stock FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Adj R2	0.521	0.530	0.521	0.519	0.530
Obs.	52,607	20,727	52,554	51,227	20,542

Figures

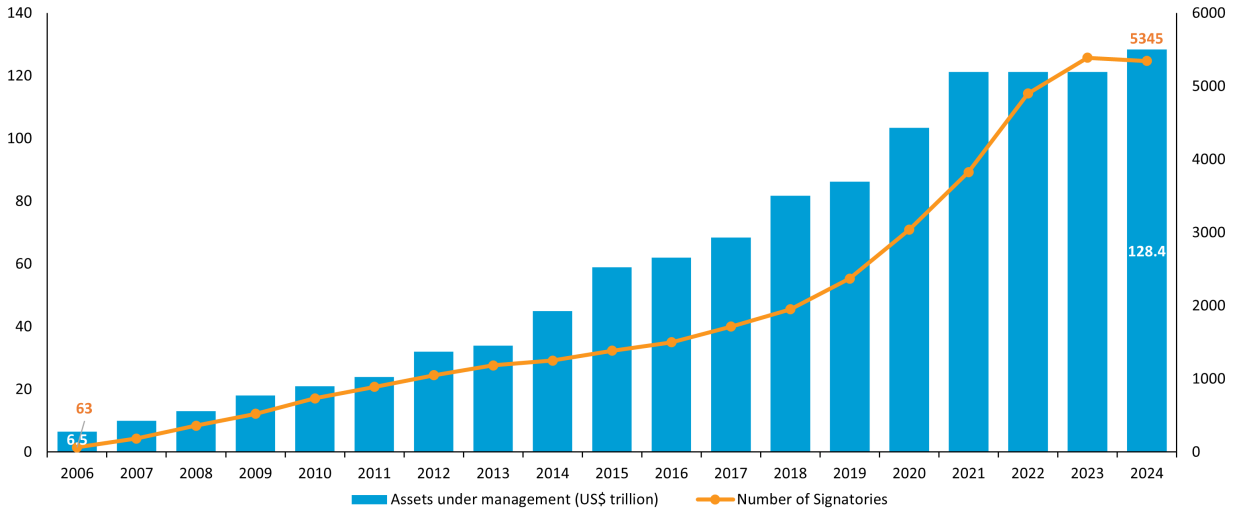

Figure 1: UNPRI Signatories

This figure plots the growths in the total number of UNPRI signatories and their assets under management (AUM) from 2006 to 2024. The data is sourced from https://www.unpri.org/about-us/about-the-pri and UNPRI annual reports. Note that for the years 2022 and 2023, the most recent total AUM data available at the time of publication was from 2021, which is $121.3 trillion.

Appendix A: Additional Tables

Table A1: Variable Definition

Variable	Variable Full Name	Definition and Notes
PI	Price Informativeness	Dávila and Parlatore (2025)
$ESGIO$	ESG Institutional Ownership	The ratio of shares held by ESG institutions to total shares held by 13F institutions, capturing the relative importance of ESG institutions, Cao et al. (2023) and Hwang et al. (2022)
IO	Institutional Ownership	the fraction of shares held by 13F institutions to total shares outstanding
ESG	ESG Rating	MSCI KLD Database, raw or size-adjusted net score
$MktCap$	Size, Market Capitalization	The natural logarithm of the product of price and shares outstanding
$Asset$	Size, Total Asset	The natural logarithm of the book value of total asset
BM	Book-to-Market Ratio	The ratio of book value to market value of equity
$TVol$	Total Volatility	Total volatility of historical monthly returns over the past 36 months
$IVol$	Idiosyncratic Volatility	The volatility of historical residual monthly returns from asset pricing model over the past 36 months
$Turnover$	Turnover	The ratio of trading volume to shares outstanding
$Analyst$	Analyst Coverage	The natural logarithm of the number of I/B/E/S analysts providing 1-year ahead earnings forecast
PIN	Probability of Informed Trading	alternative measure of price informativeness, capturing the amount of private information in stock prices brought up by informed trading Easley et al. (1998, 2002)

Continued on next page

Table A1 – continued from previous page

Variable	Variable Full Name	Definition and Notes
$\log\left(\frac{M_{i,t}}{A_{i,t}}\right)$	market valuation	The natural logarithm of the ratio of market capitalization to total assets at the end of t
$\frac{E_{i,t+h}}{A_{i,t}}$	cash flow variable	The ratio of h-quarter/year ahead EBIT to total asset at the end of t
$Leverage$	leverage ratio	The ratio of total debt to total assets
$Tangibility$	Tangibility	The ratio of net PPE to total assets
$Sales$	Sales	The ratio of sales to total assets
$Cash$	Cash	The ratio of cash and cash equivalents to total assets
$InvAsset$	inverse of asset	The inverse of total assets to control for the spurious correlation that arises from variables being scaled by total assets
$CAPX$	Capital Expenditure	The ratio of the sum of capital expenditure to beginning-of-period asset
$CAPXRND$	Capital Expenditure and R&D	The ratio of the sum of capital expenditure and R&D expenses to beginning-of-period asset
Q	Tobin's Q	The market value of equity plus book value of assets minus the book value of equity, scaled by book assets
CF	Cash Flow	The sum of net income before extraordinary items, depreciation and amortization expenses, and R&D expenses, scaled by beginning-of-period assets
$RET_{i,t+3}$	Future Return	The value-weighted market adjusted three-quarter/year cumulative returns

Table A2: Regression of PI on $ESGio$ ($ESG\_INST\%$)

	(1)	(2)	(3)	(4)
$ESGio$	0.017**	0.025***		
	(2.10)	(3.07)		
$ESG\_INST\%$			0.050***	0.021*
			(4.29)	(1.77)
IO		-0.021***		-0.018***
		(-3.67)		(-3.09)
$lnMktCap$		0.015***		0.015***
		(13.59)		(12.82)
$lnBM$		0.008***		0.008***
		(6.90)		(6.87)
$TVol$		0.072***		0.071***
		(4.12)		(4.05)
$Turnover$		0.010***		0.009***
		(8.05)		(7.96)
Stock FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Adj R2	0.520	0.522	0.520	0.522
Obs.	48,936	48,732	48,936	48,732