Socially Responsible Investors and Stock Price Informativeness*

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Abstract

We study how socially responsible investors (SRIs) affect information incorporation in price. We find that a higher level of socially responsible institutional ownership results in a lower level of informativeness of current returns on future earnings. Using an exogenous shock to SRI ownership, we show this relationship is causal. Such effect is strengthened when the ESG information attracts more attention from SRIs. Meanwhile, the market reaction to earnings (ESG) news turns weaker (stronger) with the increase in SRIs' holding. We conclude that SRIs, due to their ESG preferences, weight less (more) on earnings (ESG) information and thus hinder (facilitate) the incorporation of earnings (ESG) information into the stock price. Additional evidence indicates that SRIs enhance the relation between current returns and future ESG performance.

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Abstract

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Keywords: Socially responsible investors, ESG preference, Future earnings response coefficient (FERC), Future ESG response coefficient, information processing

JEL Classification: G14; G23; G41; M14

1. Introduction

More and more institutional investors are incorporating environmental, social, and corporate governance (ESG) issues into their investment strategies. According to the Global Sustainable Investment Alliance (GSIA), assets managed by ESG-focused funds reached $35.3 trillion across the United States, Canada, Japan, Australasia, and Europe, an increase of more than 50% compared to the $22.8 trillion invested in 2016. The Principles of Responsible Investment (PRI), a proponent that advocates considering ESG issues for investment, has 5,319 signatories in 2022, representing US$121 trillion of assets under management (AUM).

Notably, the core concept of ESG investing is about sustainable development, and its intrinsic dictation is to focus on firms' future investment value. For example, PRI signatories state in their commitment that they have a duty to act in the best long-term interests of their beneficiaries and believe that ESG issues can affect the performance of investment portfolios. However, it still lacks empirical evidence and is unclear whether these socially responsible investors practice their commitment and deliver the promised outcomes. In this paper, we try to address this question by studying whether socially responsible investors (SRIs hereafter) generate favorable long-term value regarding firms' information environment.

Specifically, we explore how SRIs affect the stock price informativeness on future earnings.[1] If SRIs practice the innate expectation of ESG investment strategies, they are anticipated to gather, analyze, and act upon financially relevant ESG information that forecasts future fundamentals.[2] When they engage with ESG data, it will likely result in stock prices reflecting more future firm earnings. An alternative view holds that SRIs can hinder the integration of earnings information

[1] The literature documents that such informativeness is affected by firms' disclosure (Lundholm and Myers, 2002; Ettredge, Kwon, Smith, and Zarowin, 2005; Choi, Myers, Zang, and Ziebart, 2011; Dhaliwal, Radhakrishnan, Tsang, and Yang, 2012; Choi, Choi, Myers, and Ziebart, 2019) and the composition of market participants such as analysts, institutional investors, and short sellers and their trading (e.g., Ayers and Freeman, 2003; Drake, Myers, Myers, and Stuart, 2015; Bai, Philippon, and Savov, 2016; Kacperczyk, Sundaresan, and Wang, 2021; Carpenter, Lu, and Whitelaw, 2021; and Brogaard and Pan, 2022).

[2] It has been well-documented that financially material ESG information can offer insights into firms' future fundamental performance (Khan, Serafeim, and Yoon, 2016; Grewal, Riedl, and Serafeim, 2019; and Serafeim and Yoon, 2022).

into stock prices. As shown by Cao, Titman, Zhan, and Zhang (2022), SRIs might impede the integration of *current* earnings information into stock prices due to their ESG preference and heightened focus on firms' ESG performance. Similarly, as SRIs underweight firms' financial performance and allocate less attention and effort toward acquiring, analyzing, and trading based on conventional financial data, the stock price may also incorporate less information on *future* earnings, especially if the stock is predominantly held by these investors. [3] Testing these two competing hypotheses allows us to better understand the role of SRIs in shaping firms' information environment.

Using 22,059 firm-year observations in the United States from 2004 to 2019, we test the association between the holding of SRIs and stock price informativeness. We construct SRIs' ownership following Cao, Titman, Zhan, and Zhang (2022), and use the future earnings response coefficient (FERC hereafter) to proxy for stock price informativeness following Collins, Kothari, Shanken, and Sloan (1994) and Lundholm and Myers (2002). We find that a higher level of SRI ownership is associated with a lower level of stock price informativeness on future earnings. It implies that SRIs, intentionally or unintentionally, do not deliver what they promise and even make the information environment worse.

To rule out potential selection issues and establish causality in our results, we follow Heath, Macciocchi, Michaely, and Ringgenberg (2023) to exploit the discontinuity in Morningstar's "star ratings" as an exogenous shock to our independent variable, SRI ownership. Socially responsible mutual funds with one-star-higher ratings than the comparable non-socially responsible mutual funds will attract more cash flows from the rating-tracing investors (Guercio and Tkac, 2008; Reuter and Zitzewitz, 2021) and are expected to increase their holdings proportionally. Assuming socially responsible institutions invest in a similar behavior to socially responsible funds, we expect SRIs to increase their holdings in the treated firms (which are held more by the socially

[3] Consistent with this view, the model built by Goldstein, Kopytov, Shen, and Xiang (2022) suggests that as the proportion of green investors rises, asset prices increasingly reflect ESG outcomes while becoming less indicative of financial outcomes.

responsible funds than the comparable non-socially responsible mutual funds). Consistent with our expectation, we find that after the shock, the treated firms experience a significant increase in SRI ownership, and these firms' stock price informativeness on future earnings decreases significantly, compared with the control firms. [4]

We further provide evidence of the underlying mechanisms behind the reduced stock price informativeness. We hypothesize that the preference for ESG information decreases the weight allocated to earnings-related information by SRIs, hampering the incorporation of earnings information into the stock price. If SRIs' underweighting of earnings information indeed drives our results, we expect to find that stock price informativeness decreases more when the attention and efforts of SRIs are diverted by ESG information to a larger degree. Our evidence supports this conjecture. We find the impact of SRIs is stronger when firms have a higher inconsistency in ratings by third-party ESG rating agencies, when firms experience more ESG incidents (which are novel and several), and for the periods with a higher Wall Street Journal Climate Change News index. Moreover, we investigate investors' trading around earnings (ESG) news. When firms are held more by SRIs, we find the three-day cumulative abnormal returns for positive earnings surprises around earnings announcements are less positive, and more negative for adverse ESG incidents. In other words, the contemporaneous market reactions around earnings (ESG) news are weaker (stronger) in the presence of more SRIs, which further supports the role of SRIs' ESG information preference and earnings information underweighting.[5] [6]

[4] Our results remain unchanged if we follow the same setting of Heath, Macciocchi, Michaely, and Ringgenberg (2023). That is, the projected increase in socially responsible mutual funds ownership due to the shock results in a lower level of stock price informativeness. The evidence is reported in the appendix.

[5] We also decompose SRI ownership based on their heterogeneity in focus between the financially material ESG information and other ESG information. We find the adverse effects of SRIs are primarily from those who mainly make decisions based on other ESG information. This heterogeneity test provides additional evidence to our hypothesis since such kinds of SRIs are more likely to prioritize ESG information and underweight financial information. We report this finding in the appendix.

[6] We rule out the alternative explanations that our main results are due to SRIs' incapability of analyzing earnings information or firms' decreasing (increasing) the supply of earnings (ESG) information. More specifically, we find our main results do not vary with firms' information complexity as reflected in 10-K filings, and the presence of SRIs

Finally, Goldstein, Kopytov, Shen, and Xiang (2022) suggest that stock price reflects more ESG information when the firm is dominated by green investors with a preference for high ESG performance. We test this implication by adding the ESG components into our model. Similar to the construction of the future earnings response coefficient, we call it the future ESG response coefficient. The results show that a higher level of SRI ownership is associated with a larger future ESG response coefficient, namely, the stock price reflects more future ESG information. This pattern remains unchanged when we further control for earnings information in the model. In addition, we find that fewer analysts (primarily those who do not possess skills to process ESG information) follow firms held more by SRIs, potentially increasing information processing costs. It is possible that these analysts find it less profitable or more difficult to cover firms dominated by SRIs who are likely to care less about earnings-related information, the processing of which is rather their expertise.

2. Literature Review and Hypothesis Development

2.1. Literature review and contributions

Our research contributes to several strands of literature. First, an emerging literature examines the impact of SRIs on their portfolio firms' ESG and financial performance and price efficiency. Several studies show that ESG investments attract higher fund flow while do not improve or even experience underperformance in the portfolio return (e.g., Barber, Morse, and Yasuda, 2021; Liang, Sun, and Teo, 2022; and Kim and Yoon, 2023). In addition, some recent studies investigate whether SRIs act in their promise of socially responsible investment and engagement. On the one hand, Brandon, Glossner, Krueger, Matos, and Steffen (2022) and Kim and Yoon (2023) find that the US PRI signatories do not follow the PRI principles and do not show better portfolio ESG

is not significantly associated with the probability of the issuance of management forecasts, ESG disclosure scores, and the fraction of talk that is about climate issues in earnings conference calls. The appendix reports these results.

scores, suggesting greenwashing practices. Raghunandan and Rajgopal (2022) find portfolio firms of the Morningstar ESG mutual funds do not demonstrate better stakeholder-friendly track records, suggesting that these funds do not pick portfolio firms according to their proclamations. On the other hand, Dikolli, Frank, Guo, and Lynch (2022) show that Morningstar ESG mutual funds are more likely to vote in support of E&S shareholder proposals. Ilhan, Krueger, Sautner, and Starks (2023) find that climate-conscious institutional investors induce firms to disclose more climate risk. Other studies focus on firms' non-ESG aspects. For example, Cao, Titman, Zhan, and Zhang (2022) show that SRIs exacerbate the mispricing effect of quantitative signals. We extend this literature by showing that SRIs do not generate the committed long-term values, and even exert adverse impact on investee firms' information environment. Specifically, we document that SRIs lead to a significant decrease in their investee firms' stock price informativeness on future earnings. More importantly, we are the first one to use the Morningstar rating shock to establish the causality.

Second, the prior literature studying price informativeness on future earnings focuses on the disclosure effect. For instance, Lundholm and Myers (2002) find that firm disclosure reveals credible and relevant information about future earnings, increasing the information incorporated in the current stock price. Similarly, other types of firm disclosure, such as the adoption of the SFAS No. 131 segment disclosure rules, more frequent and precise management earnings forecasts, more transparent CSR disclosures, and greater financial statements comparability, are shown to enable investors to better predict future earnings, increasing the stock price's ability to predict future earnings (Ettredge, Kwon, Smith, and Zarowin, 2005; Choi, Myers, Zang, and Ziebart, 2011; Dhaliwal, Radhakrishnan, Tsang, and Yang, 2012; Choi, Choi, Myers, and Ziebart, 2019). Meanwhile, a fast-growing literature examines the role of different types of market participants in affecting stock price's incorporation of future earnings. Ayers and Freeman (2003) present evidence that the stock price of firms followed by more sell-side analysts and favored by institutional investors reflects more and earlier future earnings. Drake, Myers, Myers, and Stuart (2015) find that short sellers are likely to possess an information advantage and thus can help

improve the price informativeness on future earnings, especially when firms' information environment is weak and when analysts are highly optimistic. Bai, Philippon, and Savov (2016) document the role of institutional ownership and option trading in increasing price informativeness which is proxied by the predicted variation of future cash flows based on current stock prices. Kacperczyk, Sundaresan, and Wang (2021), instead, emphasize that informed foreign institutional investors play an important role in bringing new information into the domestic markets and improving the information environment. Carpenter, Lu, and Whitelaw (2021) find that higher state ownership results in lower price informativeness, possibly because the state's subsidies make earnings harder to predict. Brogaard and Pan (2022) show that more dark-pool trading leads to more information acquisition, which means a strong relationship between stock price and future earnings. We contribute to this literature by highlighting the importance of SRIs in affecting stock price informativeness.

Third, with the popularity of socially responsible investments nowadays, the literature starts to examine the influence of investors' ESG preferences and the interpretation of firms' ESG information. For example, a line of research shows that ESG preference and ESG information have valuable implications for asset pricing (e.g., Heinkel, Kraus, and Zechner, 2001; Pedersen, Fitzgibbons, and Pomorski, 2020; Avramov, Cheng, Lioui, and Tarelli, 2022; Cao, Titman, Zhan, and Zhang, 2022; and Pástor, Stambaugh, and Taylor, 2022). Several recent studies provide helpful insights into how this trend affects the information process. For example, Avramov, Cheng, and Tarelli (2022) highlight the role of assets' sustainability profiles and the funds' ESG preference in affecting the information acquisition process. They argue active asset managers could amplify their information acquisition scope for firms with a larger dispersion in ESG ratings compared with their peers or with a higher dispersion in the preference for green investing of their holding funds. Goldstein, Kopytov, Shen, and Xiang (2022) build a model based on the different trading and incorporation of ESG information and financial information for investor groups with or without ESG preferences. They assume that traditional investors value only the financial payoff, while ESG ("green") investors value both financial and ESG payoffs. Because of the

heterogeneous preferences, traditional and green investors seek to learn different information and trade differently on similar signals, such as the positive signals on firms' ESG payoff. Such learning and trading make stock prices reflect more information on the payoff that the dominant investors care about. We add to this literature by providing empirical evidence that SRIs' preference toward ESG information significantly affects the acquisition, trading, and incorporation of financial information and ESG information into the stock price.

Finally, the literature shows that attention and effort allocation affect investors' behavior. Hirshleifer, Lim, and Teoh (2009) document that investors underreact to firms' earnings surprises when they are distracted by the earnings announcements of other firms. Ben-Rephael, Da, and Israelsen (2017) find that institutional investors' sufficient attention and efforts facilitate information incorporation into price. In addition, Kempf, Manconi, and Spalt (2017) show that distracted shareholders monitor less intensively, causing more value-destroying managerial actions. Schmidt (2019) demonstrates that asset managers distracted by their portfolio stocks are less likely to trade in other stocks. Moreover, some recent studies prove that attention and effort allocation can affect information acquisition and processing. Abramova, Core, and Sutherland (2020) show that passive institutional investors do not effectively ask management for more disclosure when they pay less attention to it. Cao, Titman, Zhan, and Zhang (2022) document that when a stock is held more by SRIs with a heightened focus on ESG performance, financial mispricing signals such as accruals present stronger trading arbitrage opportunities, namely, these financial signals can better predict future returns. In other words, the stock price is inefficient in incorporating contemporaneous financial information. We further demonstrate here that SRIs weight less on earnings (ESG) information, and thus they allocate less (more) attention and effort to earnings (ESG) information. This kind of information underweighting and attention allocation weakens the incorporation of information about future earnings in the current stock price.

2.2. Theory and hypotheses

Recent theoretical work highlights the heterogeneity in investors' ESG preferences and how such heterogeneity can shape the information environment. For example, Avramov, Cheng, and Tarelli (2022) suggest that the amplified information acquisition in response to the greater departure of assets profile from green neutrality and of fund ESG preference from the aggregate can improve price informativeness. Goldstein, Kopytov, Shen, and Xiang (2022) build a rational expectation equilibrium model based on the assumption that informed traditional and green investors have different preferences for financial and ESG payoffs. The model implies that as the share of green investors increases, asset prices become more informative about the ESG payoff and less informative about the financial payoff. However, empirical evidence for this prediction is still lacking. A priori, whether SRIs increase the stock price informativeness on future earnings is not obvious.

On the one hand, SRIs could facilitate the incorporation of future earnings information into the stock price. The core tenet of ESG investing is sustainable development, and it commands firm managers and investors to be more future-oriented. Previous research documents that ESG performance, primarily the financially material part, is informative about firms' future fundamentals (e.g., Khan, Serafeim, and Yoon, 2016; Grewal, Riedl, and Serafeim, 2019; Pedersen, Fitzgibbons, and Pomorski, 2021; Derrien, Krueger, Landier, and Yao, 2022; and Serafeim and Yoon, 2022). Naturally, if SRIs practice the innate expectation of ESG investment strategies, they are supposed to acquire, analyze, and trade on ESG signals that contain information about future fundamentals. As a result, the current stock price will be more informative about future earnings for firms held more by SRIs.

On the other hand, SRIs may hinder the incorporation of earnings information into the stock price. SRIs, like any investors, allocate their attention and efforts across different information sources and may focus more on firms' ESG performance (Cao, Titman, Zhan, and Zhang, 2022). For instance, SRIs could prioritize social missions and therefore sacrifice profit maximization, causing suboptimal weighting on value-relevant information, including which is linked to future earnings. Even if SRIs do not intend to compromise on profit maximization, their emphasis on

firms' ESG performance and their incorporation of ESG information in their investment decisions could add difficulty and complexity to the proper weighting of financial information. These factors suggest that when a firm is held more by SRIs, its stock price will reflect less information about future earnings.

To formally test these two contending predictions, we formulate the following two competing hypotheses (stated in their alternative forms):

H1a: A higher level of SRI ownership is associated with a higher level of stock price informativeness on future earnings.

H1b: A higher level of SRI ownership is associated with a lower level of stock price informativeness on future earnings.

3. Research Design

3.1. The future earnings response coefficient (FERC) model

Following the literature, we use the earnings response coefficient (FERC) model to measure stock price informativeness on future earnings. It reflects the extent to which future earnings are incorporated into the current stock price. The FERC model is developed by Lundholm and Myers (2002) based on Collins, Kothari, Shanken, and Sloan (1994), and is widely used in the literature (e.g., Choi, Myers, Zang, and Ziebart, 2011; Drake, Myers, Myers, and Stuart, 2015; Choi, Choi, Myers, and Ziebart, 2019; and Brogaard and Pan, 2022).[7] With firm subscripts omitted for parsimony, we have the following model :

$$R_t = \beta_0 + \beta_1 E_{t-1} + \beta_2 E_t + \sum_{i=1}^{3} (\beta_{3i} E_{t+i} + \beta_{4i} R_{t+i}) + \varepsilon_t, \quad (1)$$

[7] Based on Collins, Kothari, Shanken, and Sloan (1994), Lundholm and Myers (2002) start by explaining the current return as a function of unexpected current earnings, the cumulative change in expectations about future earnings, and noise, and then proxy for the unexpected current earnings using the level of past and current earnings and changes in expected future earnings using realized future earnings. They also control for the measurement error using future returns.

where R_t is the monthly cumulative return for fiscal year t; and E_t is the income available to common shareholders before extraordinary items deflated by the market value of equity at the beginning of fiscal year t.[8]

We then follow Lundholm and Myers (2002) to use a condensed version of Equation (1). More specifically, we sum the future annual earnings, E_{t+1}, E_{t+2}, and E_{t+3}, to get $E_{t+1,t+3}$, and we accumulate the future annual returns, R_{t+1}, R_{t+2}, and R_{t+3}, to get $R_{t+1,t+3}$. The aggregation approach helps produce a stable picture of the "future." In additional tests, we also examine the individual future years. Consistent with Lundholm and Myers (2002), we use only three years of future earnings and returns because information further out in time has been shown to have little impact on prices (Collins, Kothari, Shanken, and Sloan, 1994). We control for year and firm fixed effects and cluster the standard error by year and firm. The modified version of the FERC model is as follows:

$$R_t = \beta_0 + \beta_1 E_{t-1} + \beta_2 E_t + \beta_3 E_{t+1,t+3} + \beta_4 R_{t+1,t+3} + Year\ FE + Firm\ FE + \varepsilon_t, \quad (2)$$

where $E_{t+1,t+3}$ is the sum of income available to common shareholders before extraordinary items for fiscal years $t+1$ through $t+3$ deflated by the market value of equity at the beginning of year t.

Our measure of price informativeness on future earnings is β_3. To investigate how it is affected by socially responsible ownership (*SRIO*), we examine how β_3 changes with the level of *SRIO* using the following regression:

[8] We follow the prior studies (e.g., Lundholm and Myers, 2002; Choi, Myers, Zang, and Ziebart, 2011; Drake, Myers, Myers, and Stuart, 2015; Choi, Choi, Myers, and Ziebart, 2019) to measure returns over the fiscal year.

$$R_t = \beta_0 + \beta_1 E_{t-1} + \beta_2 E_t + \beta_3 E_{t+1,t+3} + \beta_4 R_{t+1,t+3} + \beta_5 SRIO_t + \beta_6 SRIO_t \times E_{t-1} + \beta_7 SRIO_t \times E_t + \beta_8 SRIO_t \times E_{t+1,t+3} + \beta_9 SRIO_t \times R_{t+1,t+3} + \sum \beta_n Control\ Variables + Year\ FE + \varepsilon_t, \quad (3)$$

where for fiscal year t:

SRIO is the level of socially responsible ownership in the last quarter of fiscal year t, calculated following Cao, Titman, Zhan, and Zhang (2022) using the ownership data obtained from Thomson Reuters s34.[9] Following prior studies (Drake, Myers, Myers, and Stuart, 2015;

Brogaard and Pan, 2022), we control for a number of firm characteristics, including fiscal year t values of firm value (MVE_t), book-to-market ratio (BTM_t), firm leverage ($Leverage_t$), idiosyncratic volatility ($IVOL_t$), institutional ownership (IO_t), number of analysts ($Analyst\ Coverage_t$), annual growth rate of assets ($Asset\ Growth_t$). We also follow Goldstein, Kopytov, Shen, and Xiang (2022) to include $ESG\ Score\ Change_t$ to proxy for the change of ESG information. $ESG\ Score\ Change_t$ is measured as the change of the last-of-the-year ESG score from fiscal year $t-1$ to fiscal year t. ESG score is the net score provided by MSCI KLD, calculated as the sum of Strengths minus the sum of Concerns. We further include the interaction of each of the control variables with E_{t-1}, E_t, $E_{t+1,t+3}$, and $R_{t+1,t+3}$. The detailed definitions of the other variables are in the Appendix 1.

In Equation (3), the coefficient β_8 on the interaction term $SRIO_t \times E_{t+1,t+3}$ shows whether more information on future earnings is incorporated in the current price when *SRIO* is higher. If β_8 is significantly positive, H1a is supported. Rather, if β_8 is significantly negative, H1b is supported.

[9] More specifically, Cao, Titman, Zhan, and Zhang (2022) sort the institutions using value-weighted ESG scores (size-adjusted net score provided by MSCI ESG STATA (formerly known as KLD)) of their investee firms into three ranks and classify those in the top tercile as socially responsible institutions. SRIO is measured as the percentage of shares held by socially responsible institutions scaled by shares held by all institutions.

3.2. Sample and data

Our sample is the panel data after merging several databases. We obtain earnings information and firm characteristics of the U.S. listed firms from Compustat, stock returns from CRSP, and the quarterly institutional holdings (13F) from Thomson Reuters. After merging these three databases and deleting observations with missing variables in Equation (3), we get a sample containing 22,059 firm-year observations and 3,196 unique U.S. firms, spanning from fiscal year 2004 to 2019.[10]

3.3. Summary statistics

Table 1 Panel A reports the summary statistics of all key variables in Equation (3), winsorized at the 1st and the 99th percentiles when appropriate to contain potential undue influences of outliers. On average, SRI ownership is 11.3% of the total institutional ownership. Panel B reports the Pearson correlations of the variables. The positive correlations between E_{t-1}, E_t, and $E_{t+1,t+3}$ indicate a moderate level of innate persistence of accounting profitability. The positive correlation between $E_{t+1,t+3}$ and $R_{t+1,t+3}$(i.e., 0.312) is consistent with the long-held notion that accounting earnings contain value-relevant information.

[Insert Table 1 about here]

4. Empirical Results

4.1. Baseline results

We first run the ordinary least square (OLS) panel regression in Equations (2) and (3) to examine the relationship between socially responsible ownership and stock price informativeness on future earnings. Table 2 reports the results. Column (1) presents the estimation results for Equation (2), which is the traditional FERC model, with control variables. Consistent with the findings in prior

[10] The sample period starts from 2004 because Cao, Titman, Zhan, and Zhang (2022) find that socially responsible investing accelerates around 2004, and SRIs had little influence prior to 2004.

research, the coefficients of E_{t-1} and $R_{t+1,t+3}$ are negative and the coefficients of E_t and $E_{t+1,t+3}$ are positive.[11] Column (2) presents the results of Equation (3). The coefficient of the variable of our main interest, i.e., $SRIO_t \times E_{t+1,t+3}$ is significantly negative (coef. = -0.475, t = -2.38). In terms of the magnitude of the economic effect, a one-standard-deviation increase in SRIO is associated with around an 8.95% (0.088*0.475/0.467) decrease in FERC. This finding supports our H1b that the presence of SRIs weakens the price informativeness on future earnings.[12][13] In other words, SRIs do not deliver the long-term value they promise, as evident by the worse information environment.

[Insert Table 2 about here]

4.2. Identification

The documented negative relationship between SRI ownership and price informativeness on future earnings potentially suffers from selection concerns. For example, SRIs may choose to invest in companies that happen to have lower price informativeness on future earnings.[14] To mitigate such concern, we follow Heath, Macciocchi, Michaely, and Ringgenberg (2023) to exploit the change in Morningstar ratings of fund performance as an exogenous shock to SRI ownership. Morningstar ranks (ranging from 1 to 5 stars) investment funds according to their historical (over the past 3, 5, and 10 years) risk-adjusted returns. Because investors trace and often fixate on the discrete ratings

[11] The negative coefficient on past earnings (i.e., E_{t-1}) reflects the mean-reversion nature of earnings, and the negative coefficient on future returns (i.e., $R_{t+1,t+3}$) demonstrates that the realized future earnings contain measurement error that future returns remove (Lundholm and Myers (2002)).

[12] In an additional analysis, we replace the aggregated earnings variable, $E_{t+1,t+3}$, with the disaggregated earnings, E_{t+1}, E_{t+2}, and E_{t+3}, and the cumulative returns in the future three years, $R_{t+1,t+3}$, with returns in each of the three years, R_{t+1}, R_{t+2}, and R_{t+3}. We report the results in Appendix 2 Table A1. Column (2) shows that the coefficients of $SRIO_t \times E_{t+i}$ are negative in years $t+1$ and $t+2$ and significant only in $t+2$.

[13] We also use an alternative measure of SRIO by replacing the denominator with total shares outstanding. We report the results in Appendix 2 Table A2. Column (2) shows our results remain robust.

[14] More specifically, SRIs could invest in firms that also appeal to long-term investors, e.g., firms with stable earnings. As a result, the stocks are not actively traded and are not particularly responsive to short-term earnings information. Alternatively, SRIs may invest in firms that conduct more ESG activities and are thus embedded with more ESG-related information. Such information is more difficult to process and analyze, causing less efficient incorporation of future earnings information through either attention and resource diversion or adding complexity to investors' processing of earnings information.

(Guercio and Tkac, 2008; Reuter and Zitzewitz, 2021), even if two funds are largely similar in various fundamental aspects, they will still observe drastically different fund flows when they receive different ratings.[15] In other words, funds that happen to jump to a relatively higher rating experience an exogenous shock (we call it a "Morningstar rating shock") to their fund flows. We choose treated funds from socially responsible mutual funds and control funds from the rest of the funds, and ensure each treated fund experiences a Morningstar rating shock (i.e., an increase in rating and thus fund flow) relative to its control fund. Consequently, the treated socially responsible funds will attract more cash flows from investors and increase their portfolio holdings. Accordingly, firms held more by these treated funds than the control funds are likely to experience a sudden increase in their SRI ownership after the Morningstar rating shock.

4.2.1. Mutual fund side

To identify the treated funds and control funds, we start with all Morningstar equity mutual funds with available star ratings, risk-adjusted returns (3-, 5-, and 10-year lagged basis), and investment categories. We aggregate the fund class-level information and perform the analysis at the fund level. We obtain funds' characteristics (e.g., asset under management, expense ratio, and management fee) from CRSP Mutual Fund and the detailed fund holdings from Thomson Reuters. Then we classify mutual funds with ESG scores ranked in the top tercile of the sample as the socially responsible mutual fund (SRMF) and then constitute our treatment funds, and the rest are classified as the non-socially responsible mutual fund (Non-SRMF).

In a given year, for each treatment fund we first select all the Non-SRMFs that meet the following criteria: 1) fall in the same Morningstar investment category as does the treatment fund; 2) have assets under management (AUM, in millions) and risk-adjusted returns that are within $\pm$ 40% of the treated fund in the previous December; 3) and have a rating of at least one star lower

[15] Heath et al. (2022) also mention that the Morningstar ratings are nearly impossible to be manipulated by investors after 2002 because of the scrutiny of the Securities and Exchange Commission (SEC) (Duong and Meschke, 2020; Kim, 2022).

than the treatment fund in January of the year. Then, within this subset we further identify those Non-SRMFs with a rating that is within 0.5 stars of the treatment fund in the previous December.[16] If multiple Non-SRMFs meet these criteria, the one with the closest risk-adjusted return to the treatment fund in the previous December is chosen as the control fund.[17] Through this process, each pair of treatment and the control funds are very similar in relatively long-term historical performance, as evidenced by their close ratings in the previous December. However, the treatment fund experiences a discrete increase in rating within a month that is likely driven by the discrete rating system and unlikely by significant performance improvement. If investors fixate on the ratings and correspondingly invest more in the treatment firm, the additional cash flow would be caused by an exogenous factor (i.e., random perturbation of returns and the discrete rating system) and not by differential fundamental performance.

Table 3 Panel A demonstrates the quality of our matching. Before the Morningstar rating shock, the treated and control funds are similar in several characteristics, including rating, AUM, Morningstar lagged three-, five-, and ten-year risk adjusted return (3YRETA, 5YRETA, and 10YRETA)), expense ratio (EXP), and management fees (MGMY_FEE). The differences are indistinguishable from zero.

Panel B of Table 3 reports the effect of the Morningstar rating shock on the ratings and AUM. We limit the window to 3 years before and after the shock (i.e., $t = -3$ to $t = 2$), with the treatment year included ($t = 0$), and we run the following regression:

$$Y_{f,t} = \gamma_0 + \gamma_1 Treat_{f,t} \times After_{f,t} + \gamma_2 Treat_{f,t} + \sum \gamma_n Control\ Variables + Event\ Year\ FE + Fund\ FE + \varepsilon_{f,t}, \quad (4)$$

[16] Fractional stars of ratings are possible because the ratings are at the fund class level while our analysis is aggregated at the fund level.

[17] We calculate the absolute percentage differences of the three risk-adjusted returns between the treated fund and the potential control funds and choose the one with the smallest average percentage difference as the control fund.

where $Y_{f,t}$ is a generic variable for $Rating_{f,t}$ and $Ln(AUM)_{f,t}$. $TREAT_{f,t}$ is equal to one for the treated fund that experiences the Morningstar rating shock and zero for the matched control group. $After_{f,t}$ is equal to one for the period following the treatment year and zero otherwise. $Control\ Variables$ is a vector of the control variables, including all the matching variables in the previous year. The coefficients of the interaction terms capture changes in the differences between the treated and control groups for the rating and AUM around the event time.

[Insert Table 3 about here]

As shown in Table 3 Panel B, γ_1 is significantly positive for $Rating_{f,t}$ and $Ln(AUM)_{f,t}$. In other words, after the Morningstar rating shock, treated funds have a higher rating, which is expected by design, and they grow to have more assets under management, which justifies the validity of the Morningstar rating shock. We also plot the time-series difference around the event year (here, we show the period from time $t = -3$ to $t = 3$) between the treated and control groups regarding ratings and AUM in Figure 1. The figures show that the rating and AUM are similar between the treated and control groups before the event and significantly different after the event.

[Insert Figure 1 about here]

4.2.2. Firm side

In a given year, as explained above, socially responsible treated funds with an increase in rating (from the previous December to the current January) will attract more cash flows from investors, and thus the invested firms are likely to experience a sudden increase in SRI ownership. Then, we identify firms held more by treated funds than control funds in the previous December as treated firms. Non-treated firms are those that do not experience any Morningstar rating shocks during the sample period. For each treated firm, we identify a control firm in the same year based on firm characteristics in the year before the shock. Our matching variables include SRIO, MVE, Analyst

Coverage, Leverage, IVOL, and ESG Score Change. Table 4 Panel A demonstrates the quality of our matching. Before the shock, the treated and control firms are similar in the matching variables.

[Insert Table 4 about here]

To the extent socially responsible institutions act in a similar way to the SRMFs, we expect treated firms to experience an increase in SRI ownership. Table 4 Panel B confirms this conjecture. We limit the window to three years before and three years after the index inclusion (i.e., $t = -3$ to $t = 3$), with the event year excluded. To validate the parallel assumption before the shock and test the effect of the shock on SRIO, we run the regression in Equation (5) respectively:

$$SRIO_t = \delta_0 + \delta_1 \times Treat \times Pre\_2_t + \delta_2 \times Treat \times Pre\_1_t + \delta_3 \times Treat \times After_t + \sum \delta_n Control\ Variables + Event\ Year\ FE + Firm\ FE + \varepsilon_t, \quad (5)$$

where $Treat$ is equal to one for the treated firms that experience the shock and zero for the matched control group. Pre_2_t is equal to one for the second year before the treated firm experiences the shock (i.e., time $t = -2$) and zero otherwise. Pre_1_t is equal to one for the year before the treated firm experiences the shock (i.e., time $t = -1$) and zero otherwise. $After_t$ is equal to one for the period following the Morningstar rating shock year and zero otherwise. $Control\ Variables$ is a vector of the control variables, including all the matching accounting variables (i.e., MVE, Analyst Coverage, Leverage, IVOL, and ESG Score Change). The coefficients of the interaction terms capture changes in the differences between the treated and control groups for SRIO around the shock.

As shown in Table 4 Panel B, δ_1 and δ_2 are insignificant for $SRIO_t$, validating the parallel trend condition. δ_3, which captures the effect of the Morningstar rating shock, is significantly positive, indicating that treated firms experience an increase in SRI ownership. Therefore, the Morningstar rating shock is a valid shock that exogenously increases SRI ownership.

Then, we examine the effect of the shock on FERC in Table 4 Panel C. We interact all the independent variables in Equation (2) with the matching estimator and control variables of Equation (5). Coefficients of the triple interaction terms, $Treat \times Pre\_2_t \times E_{t+1,t+3}$ and $Treat \times Pre\_1_t \times E_{t+1,t+3}$ are both insignificant, validating the parallel trend condition. The coefficient of $Treat \times After_t \times E_{t+1,t+3}$ is significantly negative, indicating that after the shock, FERC, our measure of stock price informativeness on future earnings, decreases significantly for treated firms compared with matched control firms. Taken together, the results demonstrate a causal relationship between socially responsible institutional ownership and stock price informativeness.

4.2.3. Firm side - robustness check

To explore the direct effect of the exogenous increase in SRMF ownership on the stock price informativeness, we also conduct the robustness check by adopting the same setting of Heath, Macciocchi, Michaely, and Ringgenberg (2023). Specifically, we use the predicted change in SRMF ownership for each firm in the sample from our paired fund-level difference-in-differences regression. Firstly, we project the treatment effect of 8.1% of fund AUM, as shown in Column (2) of Table 3, onto treated funds' holdings as of December in the pre-treatment year. We next calculate the projected change in SRMF ownership for each firm by multiplying the ownership of all treated funds identified in Section 4.2.1. in the pre-treatment year by the projected increase (i.e., 8.1%). [18] Then, this fitted value is the predicted increase in SRMF ownership due to the Morningstar rating shock. The value is zero for firms that were never held by a treated fund (i.e., control firms), and for firms that were held by any treated fund (i.e., treated firms) in pre-treatment years. The value is positive for treated firms in post-treatment years. We limit the window to 3 years before and after the shock (i.e., $t = -3$ to $t = 2$) for treated firms, with the treatment year

[18] We calculate the ownership for each firm as the sum of shares held by all treated funds as a percentage of the total shares held by the mutual funds. Please refer to Section 4.1. of Heath, Macciocchi, Michaely, and Ringgenberg (2023) for more details.

included ($t = 0$). And we interact all the independent variables in Equation (2) with this continuous fitted value and control variables. Appendix 2 Table A3 reports this result. The coefficient of the interaction term, $Predicted\ SRMF\ Ownership\ Increase_t \times E_{t+1,t+3}$, is significantly negative. These results prove the direct impact of the increase in SRMF ownership on the stock price informativeness.

5. Underlying Mechanisms

5.1. Information underweighting hypothesis

We explore the underlying mechanism through which SRI ownership negatively influences price informativeness on future earnings. Weighting different information sources is an inevitable outcome of the abundance of information available, and of limits to information processing capacity (Hirshleifer and Teoh, 2003). The choices of institutional investors to allocate their attention and efforts could lead to underreactions to news or information signals (Hirshleifer, Lim, and Teoh, 2009; Ben-Rephael, Da, and Israelsen, 2017), reduced trading probabilities and worse performance (Schmidt, 2019), and looser monitoring on managers' decisions such as voluntary disclosure (Abramova, Core, and Sutherland, 2020) and value-destroying acquisitions (Kempf, Manconi, and Spalt, 2017).

SRIs value two types of information, including financial cash flow information and ESG information (Goldstein, Kopytov, Shen, and Xiang, 2022). However, SRIs may prioritize ESG information and sacrifice the processing of earnings information. Even unintentionally, their ESG preferences and incorporation of ESG information may add difficulties in weighting earnings information properly. As a consequence, SRIs assign less weight to financial information. Such information underweighting makes them acquire and trade less on financial information, which may lead to decreased stock price informativeness related to future earnings. We call it the "information underweighting hypothesis". We now empirically test this hypothesis.

5.1.1. Weight on ESG information

Investors have a limited information-processing capacity and should allocate their attention over the business cycle, across different assets, among different risks and information sources (Kahneman (1973) and Kacperczyk, Nieuwerburgh, and Veldkamp (2016)). SRIs, intentionally or unintentionally, underweight financial information and allocate more attention and effort to ESG information. Thus, the price informativeness on future earning information will be weakened when firms are held by more SRIOs. Cao, Titman, Zhan, and Zhang (2022) also document that SRIs focus more on firms' ESG performance and underreact to the current earnings signals, leading to a slower correction of mispricing. If the negative impact of SRIs on price informativeness is driven by the underweighting on traditional financial information, the impact should be exacerbated when these institutions allocate more attention and efforts to process ESG information.

To test this hypothesis, we gauge investors' weight on ESG information using three measures: 1) ESG rating disagreement, 2) the number of ESG incidents, and 3) the Wall Street Journal (WSJ) climate change news index. First, the ratings from the various ESG rating agencies for the same firm are often inconsistent with each other (e.g., Chatterji, Durand, Levine, and Touboul, 2016; Berg, Kolbel, and Rigobon, 2022). ESG rating disagreement reflects the degree of complexity in understanding and measuring a firm's ESG performance and the level of difficulty in mapping the firm's ESG performance to its future financial performance (Berg, Kolbel, and Rigobon, 2022; Serafeim and Yoon, 2022). As a result, a higher disagreement suggests that SRIs need to commit more resources to understand the firm's ESG performance, creating a greater weighting imbalance between the ESG and earnings information and an inappropriate allocation of the SRIs' attention as well as financial and human resources.[19] We follow Serafeim and Yoon (2022) and Christensen, Serafeim, and Sikochi (2022) to use the standard deviation of four ESG ratings, including KLD, MSCI IVA, Thomson Reuters ASSET4, and SUSTAINALYTICS to measure the inconsistency of ESG ratings. To address the variation in scales employed by different rating agencies, each year

[19] According to the interviews and survey of Sustainability (2020), investors are dissatisfied with external ESG rating agencies and believe their own analysts know better than the ESG rating staff of these agencies.

we rank all firms into ten groups using each of the four rating scores. Then, we calculate the standard deviation of these rating ranks.[20]

Second, firm-specific ESG news attracts and occupies investors' attention. Accordingly, recent studies find significant market reactions around ESG news (e.g., Gantchev, Giannetti, and Li, 2022; Serafeim and Yoon, 2022 and 2023). Notably, Gantchev, Giannetti, and Li (2022) find that E&S-conscious investors are more likely to exit when firms experience negative E&S incidents, and the negative market reactions are more pronounced for firms with ex-ante more E&S-conscious investors. We hypothesize that when adverse ESG incidents occur, SRIs will react to these incidents and weight even more on ESG information, which perturbs their proper weighting on and diverts their attention from firms' future financial information. We obtain the ESG incidents data from RepRisk, a database providing negative ESG news on a daily basis. We focus on severe and novel ESG incidents (i.e., with RepRisk's Severity and Novel measures equal to or larger than two), as these ESG incidents are likely to attract more attention of SRIs.[21] Specifically, we count a firm's total number of severe and novel adverse ESG incidents within a fiscal year and use it as our second measure of investors' attention to ESG information.

Third, market-wide ESG news reflects the public's ESG awareness and draws SRIs' attention (Cao, Goyal, Zhan, and Zhang, 2023). We measure the presence of this kind of news using the average of the raw monthly WSJ news index on climate change, which captures the fraction of WSJ news related to climate change, constructed by Engle, Giglio, Kelly, Lee, and Stroebel (2020).

[20] Our results are robust if we use the standard deviation of the raw scores from three data vendors, including MSCI IVA, Thomson Reuters ASSET4, and SUSTAINALYTICS (we multiply MSCI IVA's ratings by 10 to make them comparable with the two other databases). We omit KLD here since it adopts a different scale system, and the raw scores are not comparable with the other three databases.

[21] RepRisk determines an incident's severity (harshness) by three factors: consequences (e.g., injury or death), extent of the impact (how many people are affected), and cause (e.g., by accident or in a systematic way), and novelty (newness) by whether it is the first time a company/project is exposed to the issue at the location. High-severity incidents are documented to have stronger impacts on analysts' earnings forecasts and price targets, and future stock returns (Derrien, Krueger, Landier, and Yao, 2022). We also require the incidents to be novel because SRIs are more likely to be attracted by and respond to new events.

Unlike RepRisk, this measure is comprehensive and not restricted to negative ESG news. In addition, its focus on a single ESG dimension, namely, climate change, makes it easier to interpret.

To test how the focus on ESG information impacts the influence of SRIO on FERC, we interact all the variables in Equation (3) using the three measures of investors' weight on ESG information. Table 5 columns (1), (2), and (3) report the results of the interactions using *ESG Rating Disagreement$_t$*, *Number of ESG Incidents$_t$*, and *WSJ Climate Change News Index$_t$*, respectively. The triple interaction terms of $Weight\ on\ ESG_t \times SRIO_t \times E_{t+1,t+3}$ have significantly negative coefficients for all the three measures, showing the negative impact of SRIO on price informativeness about future earnings is stronger when investors are attracted more by and weight even more on ESG information. The results support our information weighting hypothesis.

[Insert Table 5 about here]

5.1.2. Market reactions to financial news and ESG news

We then examine how SRIs affect the market reaction to earnings and ESG information. We hypothesize that SRIs weight more on ESG information and underreact to earnings information, consistent with Cao, Titman, Zhan, and Zhang (2022). As a result, contemporaneous stock price reactions around the earnings (ESG) events will be weaker (stronger) for firms with higher SRIO, as socially responsible institutions trade less (more) on earnings (ESG) information. To test this conjecture, we first examine earnings announcements, the most widely explored earnings events in the literature. We focus on the market reactions to earnings surprises around quarterly earnings announcements to ensure the events contain new information that has not been incorporated into the price. We calculate the earnings surprise each fiscal year-quarter following Livnat and Mendenhall (2006). The measure of earnings surprises, the standardized unexpected earnings based on analysts' forecast ($SAFE_q$, in percentage) is calculated by Equation (6) as follows:

$$SAFE_q = 100 \times (\frac{Actual\ EPS_q - Forecast\ EPS_q}{P_q}), \quad (6)$$

where $Actual\ EPS_q$ is the I/B/E/S reported actual "street" earnings per share (EPS) in fiscal year-quarter q, $Forecast\ EPS_q$ is the median of the latest analysts' forecasts of EPS in the 90 days prior to the date of earnings announcement in fiscal year-quarter q, and P_q is the price per share at the end of fiscal year-quarter q from Compustat.[22] The market reaction is measured by the cumulative abnormal return (CAR), which is calculated in the event window of [-1,1] and adjusted for the characteristics.[23] We then investigate how SRIO affects the CAR in response to earnings surprises. In detail, we match the quarterly CAR and earnings surprise data with SRIO in the last quarter of the year and classify stocks into high SRIO and low SRIO groups each fiscal year-quarter. We then interact the two measures of earnings surprises with the indicator for firms being in the high-SRIO group and regress CAR (in percentage) on the interaction terms and the control variables. Table 6 reports these results. The significantly negative coefficients of $High\ SRIO_d \times SAFE_q$ in columns (1) and (2) imply that the market reactions to the earnings surprise around earnings announcements are less pronounced if the stock is held by more SRIs.

[Insert Table 6 about here]

To explore the market reaction towards ESG news, we focus on the adverse ESG incidents from Reprisk that are "severe or novel", and examine how the CARs differ in high SRIO stocks and low SRIO stocks. Specifically, we regress CAR (in percentage) on the indicator for firms in the high-SRIO group and the control variables. Table 7 Panel A reports this regression result. The

[22] Please refer to Livnat and Mendenhall (2006) or the WRDS Research Application of Post-Earnings Announcement Drift, available at https://wrds-www-wharton-upenn-edu.eproxy.lib.hku.hk/pages/wrds-research/applications/portfolio-construction-and-market-anomalies/post-earnings-announcement-drift, for more details of the SAFE calculations.

[23] We assign each stock into six size-BM portfolios based on Ken French's website at http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/six_portfolios.html, and the characteristics-risk-adjusted returns are calculated by subtracting from the raw daily returns the equal-weighted size-BM daily returns of the portfolio to which the stock belongs.

significantly negative coefficient of $High\ SRIO_d$ suggests that the market reactions to the ESG news are more pronounced if the stock is held by more SRIs. We also report the average of SRIO and CARs (in percentage) in Panel B to show the general market reactions around ESG incidents in different groups. We find CARs in the full sample are significantly negative, which is consistent with the significant negative market reactions to negative ESG news or ESG incidents documented in the literature (e.g., Gantchev, Giannetti, and Li, 2022; Serafeim and Yoon, 2022 and 2023). When separately examining high SRIO and low SRIO stocks, we find only the sample with high SRIO has significantly negative CARs. In summary, both Table 6 and Table 7 demonstrate that the price reaction to earnings (ESG) news becomes weaker (stronger) when the firm is held more by SRIs. These results lend further support to our main hypothesis.

[Insert Table 7 about here]

5.1.3. Investor heterogeneity

We show the presence of SRIs, on average, damages the information environment. However, institutions differ in the focus between financially material ESG information and other ESG information when they make decisions. Our hypothesis implies that SRIs weight more on ESG information and less on financial information. We conjecture that institutions that focus on other ESG information, which is non-financially relevant information, are more likely to underweight financial information and hinder the incorporation of earnings information into stock prices. To test this conjecture, we follow Khan, Serafeim, and Yoon (2016) to hand-map sustainability investments classified as material for each sector into firm-specific ESG scores. [24] This allows us to calculate the financially material ESG scores of each SRI's portfolio. Specifically, we sort SRIs into two ranks based on the median of the portfolio-level financially material ESG scores. We

[24] We use the sector-specific instead of industry-specific guidance on materiality from the Sustainability Accounting Standards Board (SASB), as Khan, Serafeim, and Yoon (2016) show that "industries within a sector generally had similar issues classified as material". More information can be found at the website http://www.sasb.org/sics/.

decompose the SRI ownership into the two categories for a given firm-year to obtain $Material\ SRIO_t$ and $Other\ SRIO_t$. We run the baseline specification in Equation (3) using those decomposed SRI ownership. Appendix 2 Table A4 reports the regression results. Consistent with our expectation, the adverse impact of SRIs is driven by those who focus on other ESG information.

5.2. Alternative explanations

In addition to the information weighting hypothesis, there are alternative stories that can also explain the negative impact of SRIO on stock price informativeness. Firstly, SRIs may lack the skills to analyze and process financial information.[25] When firms are owned by more SRIs, their earnings information cannot be processed accurately by these investors, leading to decreased price informativeness. We call it the "investor skill hypothesis". Secondly, with the increase in SRIO, companies may respond to the demand from their major shareholders by disclosing more ESG information. At the same time, they have to sacrifice the earnings information supply because of the disclosure costs.[26] The decrease in earnings information supply may lead to the decline in stock price informativeness. We call it the "information supply hypothesis". We now test the two aforementioned alternative hypotheses.

5.2.1 Investor skill hypothesis

If SRIs have less capability to process and analyze firms' earnings information, we expect they will be in a further disadvantaged position when the financial information is more complex. To test this hypothesis, we construct three measures of earnings information complexity, including the Fog index, Bog index, and LM index. Firstly, the Fog index in fiscal year t measures the

[25] For example, SRIs may be tracking ESG indexes (e.g., MSCI ESG indexes), and lack the skills to analyze firm-specific financial information.

[26] The direct costs related to disclosure include the preparation, certification, and dissemination of accounting reports, and the indirect costs can occur in the form of proprietary costs, litigation risks, and reduced innovation incentives. Please refer to Christensen, Hail, and Leuz (2021) for a detailed discussion and summary.

linguistic complexity by estimating the readability of the 10-K files in the most recent filing year. Following Li (2008), it is calculated using Equation (7):

$$Fog_t = (Words\ Per\ Sentence_t + Percent\ of\ Complex\ Words_t) \times 0.4, \qquad (7)$$

where complex words are words with three or more syllables. We also perform the editing (e.g., the deletion of heading information, tables, tabulated text, or financial statements) on the raw 10-K files following Appendix A of Li (2008) before calculating the Fog Index. Second, the Bog index in fiscal year t is the accounting reporting complexity (ARC) of the 10-K files in the most recent filing year, which is obtained directly from Hoitash and Hoitash (2018). It measures the preparation complexity relying on accounting information of eXtensible Business Reporting Language (XBRL) 10-K files, and is calculated by counting the number of XBRL accounting concepts (e.g., revenues, net inventory, and raw materials). Thirdly, the LM index in fiscal year t is the complexity of the 10-K files in the most recent filing year, which is directly from Loughran and McDonald (2023). It measures the business or information complexity based on the usage of complexity words in 10-K files (e.g., bankruptcies, counterparties, lawsuits, leases, swaps, and worldwide). All the three measures are constructed based on 10-K files, which capture the complexity investors face when analyzing firms' financial performance. To examine how firms' information complexity can impact the influence of SRIO on FERC, we interact all the variables in Equation (3) with the three measures of information complexity. Columns (1), (2), and (3) of Appendix 2 Table A5 report the results of the interactions using $Fog\ Index_t$, $Bog\ Index_t$, and $LM\ Index_t$, respectively. And we find the coefficient of the triple interaction term $Firm\ Complexity_t \times SRIO_t \times E_{t+1,t+3}$ is insignificant for all three alternative measures. The results suggest that the negative impact of SRIO on price informativeness on future earnings is not

affected by the complexity of financial information. Therefore, the skill hypothesis cannot explain the negative effects of SRIs on price informativeness about future earnings.[27]

5.2.2 Information supply hypothesis

Firms may respond to the demand of institutional investors, especially SRI, to disclose more ESG information (e.g., Flammer, Toffel, and Viswanathan, 2021; Ilhan, Krueger, Sautner, and Starks, 2023; Döring, Drobetz, Ghoul, Guedhami, and Schröder, 2023; Cohen, Kadach, and Ormazabal, 2023). Because of the disclosure cost (Christensen, Hail, and Leuz, 2021), firms may choose to decrease earnings information. With the available earnings (ESG) information decreased (increased), the stock price incorporates less earnings information, resulting in a decrease in price informativeness on future earnings. To test this hypothesis, we examine whether SRI ownership has any impact on the supply of earnings and ESG information.

We first investigate the probability of the voluntary management forecast. Management forecasts are documented to decrease the information asymmetry and increase the price informativeness (e.g., Lennox and Park, 2006; Choi, Myers, Zang, and Ziebart, 2011). We obtain management forecast data from I/B/E/S Guidance and construct indicator variables for whether managers issue any forecast in fiscal years t and $t+1$, respectively. We regress the indicator for the presence of management earnings forecast in the current or subsequent fiscal years on SRIO and the control variables. Table A6 Pane A in the Appendix 2 reports these results. In none of the specifications SRIO is statistically significant.

Next, we examine whether SRIs affect ESG disclosure. We follow Christensen, Serafeim, and Sikochi (2022) to use the ESG disclosure score from Bloomberg as a proxy for the level of firms' ESG disclosure.[28] We use the raw ESG disclosure score in fiscal years t and $t+1$. We then

[27] We also try the lengths of the 10-K files (proxied by the natural logarithm of the total number of words) following Li (2008) and the 10-K file size following Loughran and McDonald (2014). Our conclusions remain unchanged.

[28] The disclosure scores are based on the information firms disclose in sources like sustainability reports and annual reports.

regress the ESG disclosure scores in the current or subsequent fiscal years on SRIO and the control variables. Table A6 Panel B in the Appendix 2 reports these results. SRIO is not significant in these two specifications.

Since management forecasts and ESG disclosure scores do not capture the relative information supply regarding the earning and ESG information. We finally refer to the earnings conference call to examine the relative portion of supply on earnings and ESG information.[29] Recent studies show that earnings conference calls contain valuable information about climate risks (e.g., Li, Shan, Tang, and Yao, 2022; Sautner, Lent, Vilkov, and Zhang, 2023). Assuming managers focus on earnings information supplemented with climate change-related topics in the earnings conference call, we expect that the portion of the discussion related to climate change in the overall discussion measures the climate-change information supply relative to earnings information supply. Specifically, we obtain the fraction of the number of climate change bigrams over the total number of bigrams data from Sautner, Lent, Vilkov, and Zhang (2023) in fiscal years t and $t+1$.[30] We then multiply the fraction of climate talk by 1000 and regress the fraction of climate talk in the current or subsequent fiscal years on SRIO and the control variables. Table A6 Panel C in the Appendix 2 reports these results. Again, SRIO is insignificant in both of the two specifications. Overall, Table A6 shows that the coefficients of SRIO are insignificant for all the information supply measures, indicating that SRIs do not have a significant impact on the information supply. In other words, the results are inconsistent with the information supply hypothesis.

6. Consequences

6.1. Future ESG response coefficient

[29] Earnings conference calls are key corporate events in which managers explain the just-announced earnings information to investors and answer questions from investors about current and future developments material to the firm (Hollander, Pronk, and Roelofsen, 2010; Sautner, Lent, Vilkov, and Zhang, 2023).

[30] Sautner, Lent, Vilkov, and Zhang (2023) call the fraction of climate the climate change exposure, and they create the annual measure by averaging the quarterly measures.

Our evidence suggests that SRIs weight more on ESG information, and thus they acquire and trade less on earnings information, leading to decreased price informativeness about future earnings. This result is in line with Goldstein, Kopytov, Shen, and Xiang (2022) that a higher fraction of green investors reduces price informativeness about the financial payoff. Another implication of our analysis of the information underweighting hypothesis is that SRIs acquire and trade more on ESG information, leading to an increase in the future ESG response coefficient (i.e., stock price informativeness on future ESG performance). To test this implication, we use the change in ESG score to proxy for the ESG performance.[31] To examine the impact of SRIO on future ESG response coefficient, we run the following model:

$$\begin{aligned} R_t = {} & \alpha_0 + \alpha_1 ESG\ Score\ Change_{t-1} + \alpha_2 ESG\ Score\ Change_t \\ & + \alpha_3 ESG\ Score\ Change_{t+1,t+3} + \alpha_4 R_{t+1,t+3} + \alpha_5 SRIO_t \\ & + \alpha_6 SRIO_t \times ESG\ Score\ Change_{t-1} + \alpha_7 SRIO_t \times ESG\ Score\ Change_t \\ & + \alpha_8 SRIO_t \times ESG\ Score\ Change_{t+1,t+3} + \alpha_9 SRIO_t \times R_{t+1,t+3} \\ & + \sum \alpha_n Control\ Variables\ + Year\ FE + Firm\ FE + \varepsilon_t, \quad (8) \end{aligned}$$

where all variables are as defined previously. α_8 , the coefficient of $SRIO_t \times ESG\ Score\ Change_{t+1,t+3}$, captures how SRIs affect the price informativeness on future ESG performance. Table 8 Column (1) reports the regression results. α_8 is significantly positive, which means a firm's stock price reflects more ESG information when it is held by more SRIs. And this result remains unchanged when we include earnings information (i.e., E_{t-1}, E_t, and $E_{t+1,t+3}$, and their interactions with $SRIO_t$ and control variables) in Column (2). In addition, the coefficient of $SRIO_t \times E_{t+1,t+3}$ is significantly negative, consistent with the finding in Table 2 column (2). In summary, we find firms with higher SRIO have a lower (higher) future earnings (ESG) response coefficient, or equivalently a lower (higher) level of price informativeness on future earnings (ESG).

[31] We use the change to make the proxy of ESG performance, which is a stock variable, more aligned with earnings information, a flow concept.

[Insert Table 8 about here]

6.2. Future information processing costs

Analysts are widely documented to analyze and produce both market and firm-specific information and improve the information environment (e.g., Crawford, Roulstone, and So, 2012; Choi, Choi, Myers, and Ziebart, 2019). However, analysts primarily allocate their efforts to firms that are more important to their careers and already have a rich information environment (Harford, Jiang, Wang, and Xie, 2018; Driskill, Kirk, and Tucker, 2022). As a result, analysts weight more on firms that benefit them or their employer (i.e., brokerage firms) more. Therefore, we expect analysts to be less likely to follow firms with lower price informativeness on future earnings when more of the firms' investors underweight earnings information (i.e., the SRIs). However, some specific analysts, specifically those capable of analyzing ESG information, may still find it profitable to stay in such firms. To exclude such kinds of analysts, we refer to Sautner, Lent, Vilkov, and Zhang (2024) to obtain the data on "climate change analysts" who pose more climate change questions in the earnings conference calls than the yearly industry average for their coverage portfolio. We define "earnings analysts" as those who are NOT "climate change analysts". To test our prediction, we regress "earnings analyst" coverage in the next one, two, and three fiscal years on SRIO as well as the control variables to examine whether SRIs affect the number of following analysts in the future. Table 9 reports the regression results. Table 9 shows that the coefficients of SRIO are all significantly negative for the analyst coverage in the future years. [32]It suggests that a higher level of SRIO results in reduced price informativeness on future earnings, leading to a decrease in future analyst coverage.

[Insert Table 9 about here]

[32] Our results remain the same if we DO NOT exclude those "climate change analysts" and focus on the total analysts.

7. Conclusion

As socially responsible investment rapidly attains popularity, it is essential to understand whether this type of investment indeed contributes to developing a more sustainable global financial system, as indicated by its core principles. In this paper, we show that SRIs, intestinally or unintentionally, do not practice their commitments to deliver long-term value. Specifically, we provide evidence that SRIs impede the incorporation of future earnings information into stock prices, damaging the stock price informativeness on future earnings news. We further establish the causality using the Morningstar rating shock, which exogenously increases the capital of the socially responsible mutual fund. Compared with the matched control firms, firms held more by the socially responsible mutual funds, which undergo the shock, experience a significant increase in SRI ownership, and a significant decrease in stock price informativeness.

Moreover, we identify the underlying mechanism for SRIs to have a negative impact on price informativeness. Specifically, we find such an effect is more pronounced for firms with highly inconsistent ESG ratings, more ESG incidents, and for periods with a higher climate-change news index. We also find that the market responds more weakly (strongly) to earnings (ESG) news for firms with more SRI ownership. Additional evidence shows the documented impact of SRIs on stock price informativeness is driven by those who focus on ESG information that is not financially relevant. All these results are in line with the information underweighting hypothesis. We do not find any supporting evidence for the investor skill hypothesis or information supply hypothesis.

Finally, we imply from our hypothesis that SRIs assign more weight to ESG information and enhance the incorporation of such information into stock prices. We find consistent results in our empirical tests. In addition, analysts, specifically those who do not show expertise in processing ESG information, hesitate to cover firms held more by SRIs who underweight firms' financial information.

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Table 1. Description Statistics

This table presents the descriptive statistics of key variables. The sample period is from 2004 to 2019. Panel A reports the firm-year summary statistics of the earnings (i.e., income available to common shareholders before extraordinary items) in fiscal year $t-1$ scaled by the market value at the beginning of fiscal year t (E_{t-1}), earnings in fiscal year t scaled by the market value at the beginning of fiscal year t (E_t), sum of earnings for fiscal years $t+1$ through $t+3$ scaled by the market value at the beginning of fiscal year t ($E_{t+1,t+3}$), the cumulative return for fiscal year t (R_t), the cumulative return for fiscal years $t+1$ through $t+3$ ($R_{t+1,t+3}$), socially responsible institutional ownership in the most recent quarter of fiscal year t ($SRIO_t$), the natural logarithm of market value (the natural logarithm of number of common shares outstanding, in millions, multiplied by the stock price) at the beginning of fiscal year t (MVE_t), the ratio of the book value of equity to the market value of equity at the end of fiscal year t (BTM_t), the total long-term debt and total current liabilities at the end of fiscal year t scaled by the market value at the beginning of fiscal year t ($Leverage_t$), the variance of the FF(1993) three factors adjusted daily stock returns in fiscal year t ($IVOL_t$), total institutional ownership in the most recent quarter of fiscal year t (IO_t), the natural logarithm of number of analysts of fiscal year t ($Analyst\ Coverage_t$), the percentage growth of total assets in fiscal year t ($Asset\ Growth_t$), and the change of most recent ESG score in fiscal year t ($ESG\ Score\ Change_t$). All the variables are winsorized at a 1% level. Panel B reports the Pearson correlations among all the key variables.

Panel A. Descriptive statistics of key variables

t=2004-2019	Obs	Mean	Std	10-Pctl	Q1	Med	Q3	90-Pctl
E_{t-1}	22,059	0.027	0.093	-0.036	0.020	0.045	0.064	0.088
E_t	22,059	0.033	0.087	-0.041	0.021	0.049	0.071	0.097
$E_{t+1,t+3}$	22,059	0.130	0.261	-0.155	0.050	0.158	0.248	0.366
R_t	22,059	0.125	0.394	-0.325	-0.115	0.092	0.309	0.577
$R_{t+1,t+3}$	22,059	0.382	0.788	-0.452	-0.123	0.260	0.699	1.292
$SRIO_t$	22,059	0.113	0.088	0.022	0.046	0.091	0.155	0.234
MVE_t	22,059	7.588	1.528	5.789	6.454	7.386	8.504	9.733
BTM_t	22,059	0.505	0.360	0.128	0.255	0.437	0.684	0.967
$Leverage_t$	22,059	0.478	0.762	0.000	0.054	0.225	0.573	1.160
$IVOL_t$	22,059	0.019	0.010	0.009	0.012	0.017	0.023	0.031
IO_t	22,059	0.774	0.202	0.469	0.669	0.825	0.931	1.000
$Analyst\ Coverage_t$	22,059	2.198	0.808	1.099	1.792	2.303	2.833	3.178
$Asset\ Growth_t$	22,059	0.108	0.242	-0.077	-0.006	0.058	0.151	0.321
$ESG\ Score\ Change_t$	22,059	0.138	1.407	-1.000	-1.000	0.000	1.000	2.000

Panel B. Correlation of key variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(1) E_{t-1}	1.000													
(2) E_t	0.489	1.000												
(3) $E_{t+1,t+3}$	0.245	0.442	1.000											
(4) R_t	-0.125	0.172	0.235	1.000										
(5) $R_{t+1,t+3}$	-0.053	-0.053	0.312	-0.070	1.000									
(6) $SRIO_t$	0.087	0.062	0.016	-0.072	-0.131	1.000								
(7) MVE_t	0.214	0.180	0.112	-0.090	0.005	0.341	1.000							
(8) BTM_t	0.036	-0.050	-0.018	-0.313	0.061	-0.024	-0.214	1.000						
(9) $Leverage_t$	-0.148	-0.080	0.056	0.072	0.028	0.037	-0.068	0.275	1.000					
(10) $IVOL_t$	-0.391	-0.442	-0.257	-0.085	0.096	-0.193	-0.448	0.150	0.081	1.000				
(11) IO_t	0.030	0.021	-0.001	0.043	0.012	-0.117	0.134	-0.084	-0.098	-0.054	1.000			
(12) $Analyst\ Coverage_t$	0.059	0.040	0.011	-0.002	0.025	0.184	0.633	-0.189	-0.085	-0.139	0.289	1.000		
(13) $Asset\ Growth_t$	0.046	0.136	-0.039	0.172	-0.066	-0.046	-0.032	-0.140	-0.013	0.022	0.046	0.050	1.000	
(14) $ESG\ Score\ Change_t$	0.026	0.021	0.004	-0.017	0.021	-0.051	0.074	-0.003	-0.002	-0.044	0.011	0.043	-0.018	1.000

Table 2. Socially Responsible Institutional Ownership and Future Earnings Response Coefficient: Regression Evidence

This table presents an analysis of the relationship between socially responsible institutional ownership (SRIO) and the future earnings response coefficient (FERC). The dependent variable is the cumulative return in fiscal year t. Independent variables include E_{t-1}, E_t, $E_{t+1,t+3}$, and $R_{t+1,t+3}$. Control variables include MVE_t, BTM_t, $Leverage_t$, $IVOL_t$, IO_t, $Analyst\ Coverage_t$, $Asset\ Growth_t$, and $ESG\ Score\ Change_t$. In Column (2), we interact all the independent variables with $SRIO_t$ and control variables. Control variables and the related interaction terms are omitted for brevity. All regressions control for year fixed effects and firm fixed effects. The t-statistics in the brackets are calculated from clustered standard errors by year and firm. ***, **, and * denote significance at the 0.01, 0.05, and 0.10 levels based on a two-sided test.

	R_t	
	(1)	(2)
E_{t-1}	-0.186**	-1.610***
	(-2.86)	(-7.94)
E_t	0.678***	2.204***
	(7.37)	(7.62)
$E_{t+1,t+3}$	0.279***	0.467***
	(9.51)	(3.33)
$R_{t+1,t+3}$	-0.140***	-0.284***
	(-9.29)	(-5.71)
$SRIO_t$		-0.109
		(-1.42)
$SRIO_t \times E_{t-1}$		0.911
		(1.53)
$SRIO_t \times E_t$		-0.268
		(-0.73)
$SRIO_t \times E_{t+1,t+3}$		-0.475**
		(-2.38)
$SRIO_t \times R_{t+1,t+3}$		-0.240**
		(-2.82)
Controls	Yes	Yes
Year FE	Yes	Yes
Firm FE	Yes	Yes
Clustered SE	Yes	Yes
Observations	21,478	21,478
Adjusted R2	0.56	0.61

Table 3. Identification from Morningstar Rating Shock: Fund Side

This table presents the fund-side analysis of the causal relationship between socially responsible institutional ownership (SRIO) and the future earnings response coefficient (FERC) based on Morningstar Rating shock. Panel A compares the average values of the matching variables in the treatment and control groups one year before the rating shock (time $t = -1$). Panel B shows the regression results for the DID model with a matching estimator. We keep the window of three years before and after the rating shock (time $t = -3$ to $t = 2$, including $t = 0$) for the regression analysis. Dependent variables in Panel B include the rating in January of the treatment year and the natural logarithm of assets under management at the end of the treatment year. $After_{f,t}$ is equal to one for years after the treated fund experiences the rating shock and zero otherwise. $Treat_{f,t}$ is equal to one if a fund is in the treatment group and zero otherwise. Control variables (omitted for brevity) include the Morningstar overall rating, the natural logarithm of assets under management, Morningstar lagged three-year risk-adjusted return, Morningstar lagged five-year risk-adjusted return, and Morningstar lagged ten-year risk-adjusted return at the end of last year. All regressions control for event year fixed effects and fund fixed effects. The t-statistics in the brackets are calculated from clustered standard errors by fund. ***, **, and * denote significance at the 0.01, 0.05, and 0.10 levels based on a two-sided test.

Panel A. Pre-treatment comparison ($t = -1$)

	Treatment Group	Control Group	Difference	t-test (p-value)
Rating	3.211	3.158	0.053	0.421
AUM (millions)	2773.203	2423.439	349.764	0.629
3YRETA	0.097	0.093	0.004	0.252
5YRETA	0.084	0.080	0.003	0.276
10YRETA	0.077	0.076	0.001	0.685
EXP	0.009	0.009	0.000	0.917
MGMT_FEE	0.584	0.263	0.321	0.145

Panel B. Rating shock and asset under management

	$Rating_{f,t}$ (1)	$Ln(AUM)_{f,t}$ (2)
$Treat_{f,t} \times After_{f,t}$	0.339***	0.081**
	(7.48)	(2.11)
$Treat_{f,t}$	-0.085*	-0.067*
	(-1.70)	(-1.82)
Controls	Yes	Yes
Event Year FE	Yes	Yes
Fund FE	Yes	Yes
Clustered SE	Yes	Yes
Observations	2,015	2,016
Adjusted R2	0.85	0.98

Table 4. Identification from Morningstar Rating Shock: Stock Side

This table presents the stock-side analysis of the causal relationship between socially responsible institutional ownership (SRIO) and the future earnings response coefficient (FERC) based on Morningstar Rating shock. Panel A compares the average values of the matching variables in the treatment and control groups one year before the rating shock (time $t = -1$). Panels B and C show the DID model's regression results with a matching estimator. We keep the window of three years before and after the rating shock (time $t = -3$ to $t = 3$, excluding the rating shock year $t = 0$) for the regression analysis. Pre_2_t is equal to one for the second year before the treated firm experiences the rating shock (i.e., time $t = -2$) and zero otherwise. Pre_1_t is equal to one for the first year before the treated firm experiences the rating shock (i.e., time $t = -1$) and zero otherwise. $After_t$ is equal to one for years after the treated fund experiences the rating shock and zero otherwise. $Treat$ is equal to one if a fund is in the treatment group and zero otherwise. Control variables (omitted for brevity) include all the matching accounting variables (including MVE, Analyst Coverage, Leverage, IVOL, and ESG Score Change) in the previous fiscal year. In Panel B, the dependent variable is $SRIO_t$, and independent variables include the matching estimator. In Panel C, the dependent variable is R_t, and independent variables include E_{t-1}, E_t, $E_{t+1,t+3}$, and $R_{t+1,t+3}$. We interact all the independent variables with the matching estimator and control variables. We only report the interaction terms of $E_{t+1,t+3}$ with the matching estimator for brevity. All regressions control for event year fixed effects and firm fixed effects. The t-statistics in the brackets are calculated from clustered standard errors by year and firm. ***, **, and * denote significance at the 0.01, 0.05, and 0.10 levels based on a two-sided test.

Panel A. Pre-treatment comparison ($t = -1$)

	Treatment Group	Control Group	Difference	t-test (p-value)
SRIO	0.105	0.105	0.000	0.989
MVE	8.066	8.012	0.055	0.267
Analyst Coverage	2.305	2.285	0.020	0.580
Leverage	0.511	0.526	-0.014	0.831
IVOL	0.016	0.016	0.000	0.781
ESG Score Change	0.222	0.255	-0.033	0.610

Panel B. Rating shock and SRIO

	$SRIO_t$
	(1)
$Treat \times Pre\_2_t$	0.001
	(0.27)
$Treat \times Pre\_1_t$	-0.006
	(-1.24)
$Treat \times After_t$	0.012**
	(2.16)
Controls	Yes
Event Year FE	Yes
Firm FE	Yes
Clustered SE	Yes
Observations	3,681
Adjusted R2	0.55

Panel C. Rating shock and FERC

	R_t
	(1)
$Treat \times Pre\_2_t \times E_{t+1,t+3}$	0.256
	(0.95)
$Treat \times Pre\_1_t \times E_{t+1,t+3}$	-0.238
	(-1.23)
$Treat \times After_t \times E_{t+1,t+3}$	-0.601***
	(-3.92)
Controls	Yes
Event Year FE	Yes
Firm FE	Yes
Clustered SE	Yes
Observations	3,681
Adjusted R2	0.39

Table 5. The Impact of Weight on ESG Information

This table shows the impact of investors' weight on ESG information on the relationship between socially responsible institutional ownership (SRIO) and the future earnings response coefficient (FERC). The dependent variable is the cumulative return in the current fiscal year (R_t). We interact all the variables used in Column (2) of Table 2 with different measures of investors' weight on ESG information in fiscal year t ($Weight\ on\ ESG_t$), including $ESG\ Rating\ Disagreement_t$ in Column (1), $Number\ of\ ESG\ Incidents_t$ in Column (2), and $WSJ\ Climate\ Change\ News\ Index_t$ in Column (3). $ESG\ Rating\ Disagreement_t$ is proxied by the standard deviation of rating ranks (10 ranks) from four databases (i.e., KLD, MSCI IVA, Thomson Reuters ASSET4, and SUSTAINALYTICS). $Number\ of\ ESG\ Incidents_t$ is the total number of ESG incidents which are indicated as severe and novel by RepRisk during fiscal year t. $WSJ\ Climate\ Change\ News\ Index_t$ is the average of the monthly indices sourced from Engle, Giglio, Kelly, Lee, and Stroebel (2020) during fiscal year t, and then we multiply it by 1000. We only report the triple interaction terms of $SRIO_t$ and $Weight\ on\ ESG_t$ with earnings and future returns (i.e., E_{t-1}, E_t, $E_{t+1,t+3}$, and $R_{t+1,t+3}$) for brevity. All regressions control for year fixed effects and firm fixed effects. The t-statistics in the brackets are calculated from clustered standard errors by year and firm. ***, **, and * denote significance at the 0.01, 0.05, and 0.10 levels based on a two-sided test.

$Weight\ on\ ESG_t =$	R_t		
	$ESG\ Rating\ Disagreement_t$	$Number\ of\ ESG\ Incidents_t$	$WSJ\ Climate\ Change\ News\ Index_t$
	(1)	(2)	(3)
$Weight\ on\ ESG_t \times SRIO_t \times E_{t-1}$	-0.368	-1.589***	-0.431
	(-0.74)	(-3.59)	(-0.87)
$Weight\ on\ ESG_t \times SRIO_t \times E_t$	0.761	1.039*	0.408
	(1.50)	(1.84)	(1.17)
$Weight\ on\ ESG_t \times SRIO_t \times E_{t+1,t+3}$	-0.407**	-0.461**	-0.323**
	(-2.16)	(-2.29)	(-2.54)
$Weight\ on\ ESG_t \times SRIO_t \times R_{t+1,t+3}$	0.006	0.037	0.128*
	(0.13)	(0.57)	(1.92)
Controls	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Clustered SE	Yes	Yes	Yes
Observations	13,835	7,519	19,764
Adjusted R2	0.63	0.67	0.62

Table 6. Socially Responsible Institutional Ownership and Contemporaneous Market Reactions around Earnings Announcements

This table shows the impact of socially responsible institutional ownership (SRIO) on the contemporaneous market reactions to earnings surprises around earnings announcements. The dependent variable is the cumulative abnormal return (i.e., adjusted for the equal-weighted size-BM portfolio return) from days [-1, 1] around the quarterly earnings announcement ($CAR_{d[-1,1]}$, in percentage). The independent variable is the earnings surprise each fiscal year-quarter, proxied by the standardized unexpected earnings based on analysts' forecast ($SAFE_q$, in percentage). $SAFE_q$ is based on IBES-reported analyst forecasts and actuals. $SRIO_q$ is the socially responsible institutional ownership in the most recent quarter before the earnings announcement each fiscal year quarter. $High\ SRIO_q$ is equal to 1 if value of $SRIO_q$ is above the median each fiscal year-quarter and zero otherwise. Control variables (omitted for brevity) are the same as those used in Column (2) of Table 2 in the most recent fiscal year before the earnings announcement each fiscal year-quarter. We interact the independent variable and control variables with $High\ SRIO_q$. All regressions control for fiscal year-quarter fixed effects and firm fixed effects. The t-statistics in the brackets are calculated from clustered standard errors by fiscal year-quarter and firm. ***, **, and * denote significance at the 0.01, 0.05, and 0.10 levels based on a two-sided test.

	$CAR_{d[-1,1]}$	
	(1)	(2)
$High\ SRIO_q \times SAFE_q$	-0.443***	-0.425**
	(-2.68)	(-2.60)
$High\ SRIO_q$	0.054	0.526
	(0.74)	(0.98)
$Earnings\ Surprise_q$	3.753***	3.714***
	(19.93)	(20.04)
Controls	No	Yes
Year-Quarter FE	Yes	Yes
Firm FE	Yes	Yes
Clustered SE	Yes	Yes
Observations	75,788	75,788
Adjusted R2	0.09	0.09

Table 7. Socially Responsible Institutional Ownership and Contemporaneous Market Reactions around ESG Incidents

This table shows the impact of socially responsible institutional ownership (SRIO) on the contemporaneous market reactions around the ESG incident. In Panel A, the dependent variable is the cumulative abnormal return (adjusted for the equal-weighted size-BM portfolio return) from days [-1, 1] around the ESG incident, which is indicated as severe and novel by RepRisk ($CAR_{d[-1,1]}$, in percentage). $SRIO_d$ is the socially responsible institutional ownership in the most recent quarter before the incident date d. $High\ SRIO_d$ is equal to 1 if value of $SRIO_d$ is above the median each fiscal year-month and zero otherwise. Control variables are the same as those used in Column (2) of Table 2 in the most recent fiscal year before the ESG incident date. All regressions control for fiscal year-month fixed effects and firm fixed effects. The t-statistics in the brackets are calculated from clustered standard errors by fiscal year-month and firm. ***, **, and * denote significance at the 0.01, 0.05, and 0.10 levels based on a two-sided test. Panel B reports the average SRIO and CARs (in percentage) around ESG incidents for samples with high SRIO (i.e., $High\ SRIO_d = 1$) and low SRIO (i.e., $High\ SRIO_d = 0$).

Panel A. SRIO and cumulative abnormal returns

	$CAR_{d[-1,1]}$	
	(1)	(2)
$High\ SRIO_d$	-0.278**	-0.273**
	(-1.98)	(-2.05)
Controls	No	Yes
Year FE	Yes	Yes
Firm FE	Yes	Yes
Clustered SE	Yes	Yes
Observations	5,175	5,175
Adjusted R2	0.03	0.04

Panel B. Cumulative abnormal returns around ESG Incidents from days [-1, 1]

Group	Mean of SRIO (%)	Mean of CARs (%)	T-statistics of CARs
Total	17.59	-0.11	-3.12
High SRIO	23.59	-0.14	-2.93
Low SRIO	11.36	-0.08	-1.55

Table 8. Future ESG Response Coefficient

This table presents an analysis of the relationship between socially responsible institutional ownership (SRIO) and the future ESG response coefficient. The dependent variable is the cumulative return in the current fiscal year (R_t). In Column (1), independent variables include $ESG\ Score\ Change_{t-1}$, $ESG\ Score\ Change_t$, $ESG\ Score\ Change_{t+1,t+3}$, and $R_{t+1,t+3}$. $ESG\ Score\ Change_{t+1,t+3}$ is the average change of ESG score over fiscal year $t+1$ to $t+3$. In addition to the independent variables in Column (1), we add E_{t-1}, E_t, and $E_{t+1,t+3}$ into Column (2). Control variables are the same as those used in Column (2) of Table 2. In Columns (1) and (2), we interact all the independent variables with $SRIO_t$ and control variables. Control variables and the related interaction terms are omitted for brevity. All regressions control for year fixed effects and firm fixed effects. The t-statistics in the brackets are calculated from robust clustered standard errors by year and firm. ***, **, and * denote significance at the 0.01, 0.05, and 0.10 levels based on a two-sided test.

	R_t	
	(1)	(2)
E_{t-1}		-1.789***
		(-6.67)
E_t		2.068***
		(6.02)
$E_{t+1,t+3}$		0.708***
		(4.93)
$ESG\ Score\ Change_{t-1}$	0.045**	0.047**
	(2.55)	(2.88)
$ESG\ Score\ Change_t$	0.005	0.003
	(0.32)	(0.20)
$ESG\ Score\ Change_{t+1,t+3}$	0.051	0.027
	(1.64)	(0.91)
$R_{t+1,t+3}$	-0.244***	-0.310***
	(-3.87)	(-5.44)
$SRIO_t$	-0.170**	-0.065
	(-2.43)	(-0.84)
$SRIO_t \times E_{t-1}$		0.549
		(0.91)
$SRIO_t \times E_t$		-0.206
		(-0.38)
$SRIO_t \times E_{t+1,t+3}$		-0.597**
		(-2.48)
$SRIO_t \times ESG\ Score\ Change_{t-1}$	-0.011	-0.005
	(-0.63)	(-0.33)
$SRIO_t \times ESG\ Score\ Change_t$	-0.020	-0.016
	(-1.38)	(-0.99)
$SRIO_t \times ESG\ Score\ Change_{t+1,t+3}$	0.088*	0.085*
	(1.95)	(1.97)
$SRIO_t \times R_{t+1,t+3}$	-0.302***	-0.255**
	(-2.97)	(-2.88)
Controls	Yes	Yes
Year FE	Yes	Yes
Firm FE	Yes	Yes
Clustered SE	Yes	Yes
Observations	18,513	18,513
Adjusted R2	0.57	0.62

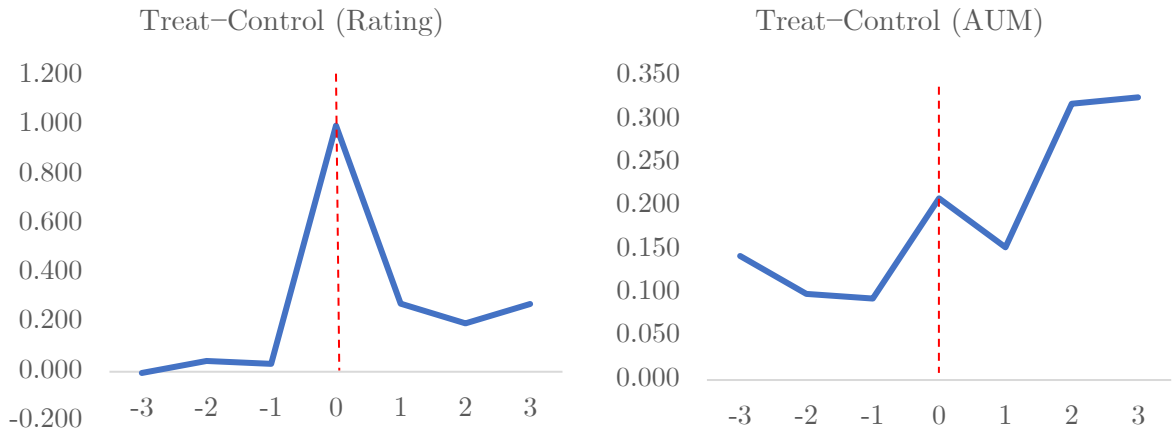
Table 9. Future Information Processing Costs

This table presents an analysis of the relationship between socially responsible institutional ownership (SRIO) and future information processing costs. The independent variable is SRIO in fiscal year t. The dependent variable is the natural logarithm of the average number of "earnings analysts" in the next one, two, or three fiscal years. "Earnings analysts" are those who are NOT classified as "climate change analysts" by Sautner, Lent, Vilkov, and Zhang (2024). Control variables are the same as those used in Column (2) of Table 2. All regressions control for year fixed effects and firm fixed effects. The t-statistics in the brackets are calculated from clustered standard errors by year and firm. ***, **, and * denote significance at the 0.01, 0.05, and 0.10 levels based on a two-sided test.

	Earnings Analyst Coverage		
	$t+1$	$t+1$ to $t+2$	$t+1$ to $t+3$
	(1)	(2)	(3)
$SRIO_t$	-0.157***	-0.216***	-0.217***
	(-3.19)	(-3.84)	(-4.60)
MVE_t	0.109***	0.106***	0.101***
	(8.88)	(9.43)	(8.62)
BTM_t	-0.083***	-0.125***	-0.144***
	(-3.39)	(-5.03)	(-5.51)
$Analyst\ Coverage_t$	0.387***	0.327***	0.274***
	(17.30)	(12.99)	(10.72)
$Leverage_t$	0.051***	0.051***	0.046***
	(4.68)	(5.18)	(4.91)
$IVOL_t$	2.431***	2.185***	2.107***
	(4.06)	(3.65)	(4.05)
IO_t	0.324***	0.285***	0.240***
	(5.45)	(5.42)	(5.32)
$Growth_t$	0.023*	0.052***	0.052***
	(1.76)	(4.11)	(4.70)
$ESG\ Score\ Change_t$	-0.003	-0.002	-0.002
	(-1.62)	(-1.20)	(-1.11)
Year FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Clustered SE	Yes	Yes	Yes
Observations	18,952	19,402	19,568
Adjusted R2	0.74	0.82	0.86

Figure 1. Parallel Trend – Fund Side

This figure plots the time series difference of rating and asset under management (AUM) between treatment and control groups in different periods around the rating shock year (i.e., from $t = -3$ to $t = 3$).



Appendix 1 Variable definitions

MVE_t: The natural logarithm of the market value of equity, calculated as the number of common shares outstanding (in millions) multiplied by the stock price at the beginning of the fiscal year t.

BTM_t: The ratio of book value of equity over the market value of equity at the end of fiscal year t.

$Leverage_t$: total debt, calculated as the sum of long-term debt and debt in current liabilities at the end of fiscal year t, scaled by the market value of equity at the beginning of fiscal year t.

$IVOL_t$: the standard deviation of the regression residual of individual stock returns on the Fama and French (1993) three factors using daily data over fiscal year t following Ang, Hodrick, Xing, and Zhang (2006).

IO_t: the total institutional ownership, calculated as the percentage of shares held by institutions over total shares outstanding in the most recent quarter of fiscal year t, calculated using the ownership data obtained from Thomson Reuters s34.

$Analyst\ Coverage_t$: the natural logarithm of the number of analysts following the firm at the end of fiscal year t, calculated using the data obtained from the Institutional Brokers' Estimate System (I/B/E/S).

$Asset\ Growth_t$: the annual growth in total assets from fiscal year $t-1$ to fiscal year t.

Appendix 2 Additional analysis

Table A1. Socially Responsible Institutional Ownership and Future Earnings Response Coefficient: Disaggregated Future Earnings

This table presents a robustness check for the relationship between socially responsible institutional ownership (SRIO) and the future earnings response coefficient (FERC) using the disaggregated future earnings. The dependent variable is the cumulative return in fiscal year t. Independent variables include E_{t-1}, E_t, E_{t+1}, E_{t+2}, E_{t+3}, R_{t+1}, R_{t+2}, and R_{t+3}. Control variables are the same as those used in Column (2) of Table 2. In Column (2), we interact all the independent variables and control variables with $SRIO_t$. Control variables and the related interaction terms are omitted for brevity. All regressions control for year fixed effects and firm fixed effects. The t-statistics in the brackets are calculated from clustered standard errors by year and firm. ***, **, and * denote significance at the 0.01, 0.05, and 0.10 levels based on a two-sided test.

	R_t	
	(1)	(2)
E_{t-1}	-0.180**	-1.709***
	(-2.69)	(-7.75)
E_t	0.567***	1.738***
	(6.41)	(6.50)
E_{t+1}	0.517***	1.742***
	(7.32)	(6.86)
E_{t+2}	0.442***	0.084
	(8.12)	(0.31)
E_{t+3}	0.249***	0.170
	(5.26)	(0.59)
R_{t+1}	-0.289***	-0.402***
	(-15.14)	(-4.10)
R_{t+2}	-0.201***	-0.368***
	(-8.55)	(-5.43)
R_{t+3}	-0.112***	-0.263**
	(-4.71)	(-2.73)
$SRIO_t$		-0.056
		(-0.69)
$SRIO_t \times E_{t-1}$		0.500
		(0.81)
$SRIO_t \times E_t$		-0.241
		(-0.60)
$SRIO_t \times E_{t+1}$		-0.593
		(-1.18)
$SRIO_t \times E_{t+2}$		-1.217**
		(-2.36)
$SRIO_t \times E_{t+3}$		0.028
		(0.07)
$SRIO_t \times R_{t+1}$		-0.378**
		(-2.70)
$SRIO_t \times R_{t+2}$		-0.153
		(-1.16)
$SRIO_t \times R_{t+3}$		-0.308*
		(-1.85)
Controls	Yes	Yes
Year FE	Yes	Yes
Firm FE	Yes	Yes
Clustered SE	Yes	Yes
Observations	21,452	21,452
Adjusted R2	0.58	0.63

Table A2. Socially Responsible Institutional Ownership and Future Earnings Response Coefficient: Alternative Measure

This table presents a robustness check of the relationship between socially responsible institutional ownership (SRIO) and the future earnings response coefficient (FERC) using an alternative measure of SRIO. We follow a similar methodology of constructing $SRIO_t$ while replacing the denominator with the total shares outstanding to obtain $SRIO_t^{\wedge}$. The dependent variable is the cumulative return in fiscal year t. Independent variables include E_{t-1}, E_t, $E_{t+1,t+3}$, and $R_{t+1,t+3}$. Control variables include MVE_t, BTM_t, $Leverage_t$, $IVOL_t$, IO_t, $Analyst\ Coverage_t$, $Asset\ Growth_t$, and $ESG\ Score\ Change_t$. We interact all the independent variables with $SRIO_t^{\wedge}$ and control variables. Control variables and the related interaction terms are omitted for brevity. All regressions control for year fixed effects and firm fixed effects. The t-statistics in the brackets are calculated from clustered standard errors by year and firm. ***, **, and * denote significance at the 0.01, 0.05, and 0.10 levels based on a two-sided test.

	R_t
	(1)
E_{t-1}	-1.513***
	(-7.26)
E_t	2.217***
	(7.54)
$E_{t+1,t+3}$	0.415**
	(2.94)
$R_{t+1,t+3}$	-0.305***
	(-6.28)
$SRIO_t^{\wedge}$	-0.156
	(-1.60)
$SRIO_t^{\wedge} \times E_{t-1}$	1.358
	(1.49)
$SRIO_t^{\wedge} \times E_t$	-0.317
	(-0.63)
$SRIO_t^{\wedge} \times E_{t+1,t+3}$	-0.648**
	(-2.21)
$SRIO_t^{\wedge} \times R_{t+1,t+3}$	-0.358***
	(-3.23)
Controls	Yes
Year FE	Yes
Firm FE	Yes
Clustered SE	Yes
Observations	21,478
Adjusted R2	0.61

Table A3. Identification from Morningstar Rating Shock: Stock Side – Robustness Check

This table presents the robustness check for the stock-side analysis of the causal relationship between the predicted change in socially responsible mutual fund (SRMF) ownership and the future earnings response coefficient (FERC) based on Morningstar Rating shock. Treated firms are those held by at least one treated fund during our sample period, and control firms are the remaining ones. For treated firms, we only keep the window of three years before and after the rating shock (i.e., time $t = -3$ to $t = 2$, including $t = 0$) for the regression analysis. The predicted change in SRMF ownership, denoted by $Predicted\ SRMF\ Ownership\ Increase_t$, for treated firms after the shock (i.e., time $t \geq 0$) is calculated as the ratio of shares held by total treated funds for each firm by the shares held by total mutual funds multiplied by 8.1% in the pretreatment year (i.e., time $t = -1$), and it is always zero for control firms and treated firms before the shock (i.e., time $t < 0$). We then standardize this continuous value. The dependent variable is R_t, and independent variables include E_{t-1}, E_t, $E_{t+1,t+3}$, and $R_{t+1,t+3}$. Control variables include those used in Column (2) of Table 2 in the previous year. We interact all the independent variables with $Predicted\ SRMF\ Ownership\ Increase_t$ and control variables. Control variables and the related interaction terms are omitted for brevity. All regressions control for event year fixed effects and firm fixed effects. The t-statistics in the brackets are calculated from clustered standard errors by year and firm. ***, **, and * denote significance at the 0.01, 0.05, and 0.10 levels based on a two-sided test.

	R_t
	(1)
E_{t-1}	-0.499
	(-0.69)
E_t	3.608***
	(4.68)
$E_{t+1,t+3}$	0.393**
	(2.85)
$R_{t+1,t+3}$	-0.213***
	(-3.48)
$Predicted\ SRMF\ Ownership\ Increase_t$	-0.001
	(-0.28)
$Predicted\ SRMF\ Ownership\ Increase_t \times E_{t-1}$	-0.032
	(-0.76)
$Predicted\ SRMF\ Ownership\ Increase_t \times E_t$	-0.024
	(-0.74)
$Predicted\ SRMF\ Ownership\ Increase_t \times E_{t+1,t+3}$	-0.031**
	(-2.89)
$Predicted\ SRMF\ Ownership\ Increase_t \times R_{t+1,t+3}$	0.015***
	(3.55)
Controls	Yes
Year FE	Yes
Firm FE	Yes
Clustered SE	Yes
Observations	20,091
Adjusted R2	0.52

Table A4. Socially Responsible Institutional Ownership and Future Earnings Response Coefficient: Disaggregated Socially Responsible Institutional Ownership

This table presents a robustness check for the relationship between socially responsible institutional ownership (SRIO) and the future earnings response coefficient (FERC) using the disaggregated level of socially responsible institutional ownership. The dependent variable is the cumulative return in fiscal year t. Independent variables include E_{t-1}, E_t, E_{t+1}, E_{t+2}, E_{t+3}, R_{t+1}, R_{t+2}, and R_{t+3}. Control variables are the same as those used in Column (2) of Table 2. We interact all the independent variables and control variables with decomposed SRIO based on financially material ESG scores classified following Khan, Serafeim, and Yoon (2016). We decompose socially responsible institutions into financially material institutions ($Material\ SRIO_t$) if the value-weighted financially material ESG scores (size-adjusted) of their investee firms are above the median and other institutions otherwise ($Other\ SRIO_t$). We Control variables and the related interaction terms are omitted for brevity. All regressions control for year fixed effects and firm fixed effects. The t-statistics in the brackets are calculated from clustered standard errors by year and firm. ***, **, and * denote significance at the 0.01, 0.05, and 0.10 levels based on a two-sided test.

	R_t
	(1)
E_{t-1}	-1.628***
	(-8.11)
E_t	2.263***
	(8.38)
$E_{t+1,t+3}$	0.434***
	(3.22)
$R_{t+1,t+3}$	-0.282***
	(-5.75)
$Material\ SRIO_t$	-0.188
	(-1.67)
$Material\ SRIO_t \times E_{t-1}$	-0.006
	(-0.01)
$Material\ SRIO_t \times E_t$	-0.543
	(-0.53)
$Material\ SRIO_t \times E_{t+1,t+3}$	0.354
	(0.81)
$Material\ SRIO_t \times R_{t+1,t+3}$	-0.223*
	(-2.12)
$Other\ SRIO_t$	0.068
	(0.82)
$Other\ SRIO_t \times E_{t-1}$	-0.285
	(-0.49)
$Other\ SRIO_t \times E_t$	-0.071
	(-0.08)
$Other\ SRIO_t \times E_{t+1,t+3}$	-0.711**
	(-2.51)
$Other\ SRIO_t \times R_{t+1,t+3}$	-0.240*
	(-2.05)
Controls	Yes
Year FE	Yes
Firm FE	Yes
Clustered SE	Yes
Observations	21,465
Adjusted R2	0.60

Table A5. The Impact of Investor Skills to Analyze Earnings Information

This table shows the impact of investor earning analysis skills on the relationship between socially responsible institutional ownership (SRIO) and the future earnings response coefficient (FERC). The dependent variable is the cumulative return in fiscal year t (R_t). We interact all the variables used in Column (2) of Table 2 with different measures of firm complexity in fiscal year t ($Firm\ Complexity_t$), including $Fog\ Index_t$ in Column (1), $Bog\ Index_t$ in Column (2), and $LM\ Index_t$ in Column (3). $Fog\ Index_t$ is constructed using the average words per sentence and percent of complex words of the 10-K files in the most recent filing year before fiscal year t following Li (2008). $Bog\ Index_t$ is the accounting reporting complexity using the count of accounting items in XBRL segments of the 10-K files in the most recent filing year before fiscal year t from Hoitash and Hoitash (2018). $LM\ Index_t$ is the firm-level complexity created using word usage of the 10-K files in the most recent filing year before fiscal year t from Loughran and Mcdonald (2023). We only report the triple interaction terms of $SRIO_t$ and $Firm\ Complexity_t$ with earnings and future returns (i.e., E_{t-1}, E_t, $E_{t+1,t+3}$, and $R_{t+1,t+3}$) for brevity. All regressions control for year fixed effects and firm fixed effects. The t-statistics in the brackets are calculated from clustered standard errors by year and firm. ***, **, and * denote significance at the 0.01, 0.05, and 0.10 levels based on a two-sided test.

	R_t		
$Firm\ Complexity_t =$	$Fog\ Index_t$	$Bog\ Index_t$	$LM\ Index_t$
	(1)	(2)	(3)
$Firm\ Complexity_t \times SRIO_t \times E_{t-1}$	0.053	0.002	-2.732
	(1.48)	(0.35)	(-1.17)
$Firm\ Complexity_t \times SRIO_t \times E_t$	-0.003	-0.000	-2.617
	(-0.06)	(-0.02)	(-1.06)
$Firm\ Complexity_t \times SRIO_t \times E_{t+1,t+3}$	-0.007	0.002	1.010
	(-0.46)	(0.80)	(1.07)
$Firm\ Complexity_t \times SRIO_t \times R_{t+1,t+3}$	0.001	-0.001*	-0.051
	(0.22)	(-2.00)	(-0.22)
Controls	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Clustered SE	Yes	Yes	Yes
Observations	16,901	9,974	21,039
Adjusted R2	0.60	0.65	0.61

Table A6. Socially Responsible Institutional Ownership and Information Supply

This table presents an analysis of the relationship between socially responsible institutional ownership (SRIO) and information supply regarding earnings, ESG, and climate change information in the current and next fiscal years. The independent variable is SRIO in fiscal year t. In Panel A, $Management\ Forecast_t$ is the indicator of management forecast in fiscal year t, which is equal to one if managers issue any forecast of earnings per share (EPS), no matter the periodicity, during the fiscal year and zero otherwise. The dependent variable is the indicator of the management forecast of EPS in the current or subsequent fiscal years. Control variables include those used in Column (2) of Table 2 for Column (1), and we additionally include $Management\ Forecast_t$ for Column (2). In Panel B, $ESG\ Disclosure\ Score_t$ is the ESG disclosure score in the most recent year before fiscal year t obtained from Bloomberg. The dependent variable is the ESG disclosure score in the current or subsequent fiscal years. Control variables include those used in Column (2) of Table 2 for Column (1), and we additionally include $ESG\ Disclosure\ Score_t$ for Column (2). In Panel C, $Fraction\ of\ Climate\ Talk_t$ is the ratio of the number of climate-change-related bigrams divided by the total number of bigrams contained in the earnings conference call transcript in fiscal year t from Sautner, Lent, Vilkov, and Zhang (2023), and we multiply it by 1000. $Ln(Number\ of Bigrams)_t$ is the natural logarithm of the total number of bigrams contained in the earnings conference call transcript in fiscal year t. The dependent variable is the fraction of climate talk multiplied by 1000 over the current or subsequent fiscal years. Control variables include $Ln(Number\ of\ Bigrams)_t$ and those used in Column (2) of Table 2 for Column (1), and we additionally include $Fraction\ of\ Climate\ Talk_t$ for Column (2). All regressions control for year fixed effects and firm fixed effects. The t-statistics in the brackets are calculated from clustered standard errors by year and firm. ***, **, and * denote significance at the 0.01, 0.05, and 0.10 levels based on a two-sided test.

Panel A. SRIO and Earnings Information Supply

	Management Forecast	
	t	$t+1$
	(1)	(2)
$SRIO_t$	0.021	-0.033
	(0.30)	(-0.74)
$Management\ Forecast_t$		0.326***
		(12.10)
MVE_t	0.003	0.007
	(0.21)	(0.78)
BTM_t	0.045**	-0.019
	(2.25)	(-1.15)
$Analyst\ Coverage_t$	0.055***	0.015
	(3.93)	(1.31)
$Leverage_t$	-0.017	0.007
	(-1.54)	(0.94)
$IVOL_t$	-0.666	-2.287***
	(-1.00)	(-2.96)
IO_t	0.121**	0.052
	(2.14)	(1.05)
$Growth_t$	0.004	0.036***
	(0.37)	(3.24)
$ESG\ Score\ Change_t$	0.001	-0.005***
	(0.72)	(-3.07)
Year FE	Yes	Yes
Firm FE	Yes	Yes
Clustered SE	Yes	Yes
Observations	8,726	8,726
Adjusted R2	0.73	0.77

Panel B. SRIO and ESG Information Supply

	ESG Disclosure Score	
	t	$t+1$
	(1)	(2)
$SRIO_t$	-1.678	-0.793
	(-1.00)	(-1.68)
$ESG\ Disclosure\ Score_t$		0.743***
		(24.64)
MVE_t	-0.449**	0.100
	(-2.33)	(1.21)
BTM_t	0.118	0.113
	(0.33)	(0.94)
$Analyst\ Coverage_t$	1.086***	0.328***
	(3.65)	(3.49)
$Leverage_t$	-0.0172	0.065
	(-0.09)	(0.81)
$IVOL_t$	0.845	1.652
	(0.08)	(0.21)
IO_t	-4.672***	-1.442***
	(-3.82)	(-3.46)
$Growth_t$	-0.361*	-0.032
	(-2.07)	(-0.28)
$ESG\ Score\ Change_t$	-0.0613	-0.038
	(-1.08)	(-1.18)
Year FE	Yes	Yes
Firm FE	Yes	Yes
Clustered SE	Yes	Yes
Observations	12,075	12,075
Adjusted R2	0.85	0.93

Panel C. SRIO and Climate Change Information Supply

	Fraction of Climate Talk	
	t	$t+1$
	(1)	(2)
$SRIO_t$	-0.241	-0.166
	(-1.70)	(-0.96)
$Fraction\ of\ Climate\ Talk_t$		0.419***
		(10.42)
$Ln(Number\ of\ Bigrams)_t$	0.076	-0.087*
	(1.20)	(-2.00)
MVE_t	-0.011	-0.046*
	(-0.57)	(-1.93)
BTM_t	-0.039	0.013
	(-0.68)	(0.25)
$Analyst\ Coverage_t$	-0.050	0.008
	(-1.66)	(0.27)
$Leverage_t$	-0.062***	-0.036*
	(-3.20)	(-1.88)
$IVOL_t$	0.092	0.106
	(0.06)	(0.07)
IO_t	-0.020	0.070
	(-0.20)	(1.16)
$Growth_t$	0.040	-0.035
	(1.52)	(-1.63)
$ESG\ Score\ Change_t$	-0.003	-0.006
	(-0.60)	(-0.95)
Year FE	Yes	Yes
Firm FE	Yes	Yes
Clustered SE	Yes	Yes
Observations	16,627	16,550
Adjusted R2	0.85	0.88