

Does Sustainable Investing Make Stocks Less Sensitive to Information about Cash Flows?*

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Abstract

Traditional finance theory asserts that stock prices depend on expected future cash flows. We explore how the growing prominence of non-pecuniary preferences in the form of sustainable investing alters this core financial relationship. Using the setting of earnings announcements, we find that sustainable investing diminishes stock price sensitivity to earnings news by 45%-58%. This decline in announcement-day returns is mirrored by a comparable drop in trading volume. This effect persists beyond the immediate announcement period, implying a lasting alteration in price formation rather than a short-lived mispricing. Our findings suggest that sustainable investing reduces the significance of cash flows in shaping stock prices.

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1 Introduction

Traditional finance textbooks define stock prices as being driven by the discounted expected future cash flows, establishing a fundamental link between price shifts and changes in cash flow expectations. However, this bedrock principle of modern finance relies on the importance of future cash flows for investors who ultimately dictate prices. In recent years, an increasing number of investors have embraced non-pecuniary “sustainability” considerations, such as environmental, social, and corporate governance (ESG) factors, in their investment strategies. This emerging trend raises a fundamental question: How does sustainable investing influence the connection between future cash flows and stock prices?

In this paper, we tackle this question using the setting of earnings announcements. We focus on earnings announcements because they represent the quintessential scenario for investigating how stock prices respond to news concerning future cash flows, featuring a well-established pattern. When a company’s reported earnings significantly deviate from expectations, the company’s stock experiences pronounced price movements. The prevailing interpretation of stock price reactions to earnings “surprises” attributes them to shifts in investor expectations regarding future cash flows.¹

The central goal of our study is to understand how sustainable investing influences this conventional pattern. We specifically ask whether stocks with a substantial level of ownership by sustainable investors exhibit distinct price responses to earnings announcements. Our definition of sustainable investors relies on the value-weighted average ESG score of

¹This pattern has been extensively documented over the past few decades. Notable examples of early studies that explored this phenomenon include research by [Ball and Brown \(1968\)](#), [Bernard and Thomas \(1989\)](#), and [Bernard and Thomas \(1990\)](#). These studies laid the foundation for understanding post-earnings announcement price movements and have since paved the way for further investigations into this area of finance and accounting research.

the investors’ portfolio holdings. Given the variations in ESG scores across different data providers, as highlighted by [Berg et al. \(2022\)](#), we employ three distinct ESG datasets: MSCI ESG, MSCI KLD, and Refinitiv ESG. While each dataset has its own advantages and limitations, which we describe in [Section 2](#), our findings remain consistent irrespective of the chosen dataset or the criteria employed for classifying investors as “sustainable” within that dataset.

[Figure 1](#) visually represents our primary findings across all three datasets. In each graph, the X-axis displays the measure of earnings surprise, while the Y-axis portrays the abnormal stock return on the day of the announcement. Across all three panels, we confirm the standard pattern: stocks exhibiting more substantial earnings surprises correspondingly yield higher announcement-day returns. Our main contribution is to examine the disparities between stocks with high and low levels of ownership by sustainable investors, denoted as “sustainable ownership.” The figure conspicuously demonstrates that stocks with a high degree of sustainable ownership display a diminished response to earnings news. This novel pattern persists across the entire spectrum of news but becomes significantly more pronounced in the face of extreme earnings events.

Expanding upon this foundational pattern, we employ a methodology inspired by [DellaVigna and Pollet \(2009\)](#) to rigorously quantify the impact of sustainable ownership. Our model specifications assess how stock prices react to information by comparing the returns associated with positive news relative to negative news, across stocks with varying levels of sustainable ownership. Our empirical results in [Section 3](#) reveal that the immediate price response to news is substantially weaker for stocks with a high degree of sustainable ownership, ranging from approximately 45% to 58%, depending on the dataset under consideration. Importantly, our estimates are not confounded by several well-documented factors

that typically influence earnings responses, such as the “Friday” effect (DellaVigna and Pollet (2009)), macroeconomic news effects or analyst following (Hirshleifer and Sheng (2022)), clustering of announcements by firms (Hirshleifer et al. (2009)), or overall market returns on the announcement day (Gulen and Hwang (2012)).

If the divergence in news response is indeed attributable to the trading activities of investors with distinct preferences, we would anticipate a parallel reduction in trading volume. In accordance with this hypothesis, our analysis reveals that stocks characterized by high levels of sustainable ownership exhibit a substantial decrease of 68% to 83% in abnormal trading volume on announcement days.

Our subsequent analysis delves into the price dynamics following the announcement day, considering three distinct scenarios. The first possibility centers on the idea that the subdued price response of stocks with high sustainable ownership presents an arbitrage opportunity for other investors who place greater value on future cash flows. In this scenario, we would expect prices to gradually converge over the post-announcement period, eventually eliminating the initial underreaction observed in stocks with high sustainable ownership.

The second possibility is that prices continue to diverge. This divergence can be attributed to the fact that prices often continue to “drift” after an announcement. One explanation for this drift posits that some investors act on information immediately, while others react with a delay (Hong and Stein (1999), Fedyk (2018)). If sustainable investors are more inclined to respond to cash flow information with a delay, we should observe a drift in both types of stocks, with the effect being weaker for those with high sustainable ownership. This dynamic would amplify the differential price response during the post-announcement period.

Lastly, the third possibility entails neither price convergence nor further divergence. This

scenario arises where there is minimal trading activity among cash-sensitive arbitrageurs or where their trading activity can only offset the delayed response to news but not the immediate response. The final outcome will depend on the interplay of these factors in the market.

Our examination of post-announcement returns reveals that prices do not converge; in fact, they tend to further diverge in several of our tests. For instance, in the MSCI KLD data, we observe that the delayed response of stock prices to news is approximately 77% weaker for stocks with a high degree of sustainable ownership, indicating a significantly weaker price drift in these stocks. Simultaneously, various other tests fail to provide compelling evidence for either convergence or continued divergence. Collectively, these results suggest that arbitrage trading by cash-flow-sensitive investors is not sufficient to eliminate the initial underreaction. Consequently, the influence of sustainable ownership appears to become a permanent factor in stock prices rather than being "corrected" by arbitrageurs.

In our primary analyses, we utilize three distinct datasets, two definitions for the strength of earnings surprise, and two measures of sustainable ownership – one based on discrete cutoffs and the other being a continuous measure. Given our focus on four distinct outcome variables, our baseline tests encompass a total of 48 unique regression specifications ($3 \times 2 \times 2 \times 4$). We stress that we observe consistent results of similar magnitudes in 39 out of these 48 specifications. Furthermore, we corroborate these findings after altering the definition of sustainable investor to account for potential short-term variations in investor preferences over time.

To further bolster the robustness and validity of our findings, we conduct a series of tests and validations in Section 4. We first show that our findings do not persist in tests

that investigate the disparities between stocks with high and low ESG scores. This outcome underscores that our results are primarily shaped by investor preferences rather than the inherent characteristics of the underlying stocks. This result conveys a broader message: the pricing effects related to stock characteristics are driven by investor preferences for these characteristics rather than the characteristics themselves. Consequently, an exclusive focus on a stock's ESG scores when attempting to discern the impact of ESG investing on asset prices may yield misleading conclusions. Second, we validate the significance of investor preferences, and demonstrate that our results are not present in the 1980s and 1990s, a period when investors exhibited less inclination toward sustainable investing.

Our study bridges two significant bodies of literature in finance: one that delves into how financial markets respond to fundamental information and another that explores the impact of sustainable investing on asset prices. The seminal works by [Ball and Brown \(1968\)](#), [Bernard and Thomas \(1989\)](#), and [Bernard and Thomas \(1990\)](#) have long established the centrality of understanding how the market assimilates cash flow information during earnings announcements. A key insight from this research is the substantial variability in stock responses to earnings news, influenced by factors such as limited attention ([DellaVigna and Pollet \(2009\)](#); [Hirshleifer et al. \(2009\)](#)), sentiment ([Mian and Sankaraguruswamy, 2012](#)), and behavioral biases ([Hartzmark and Shue, 2018](#)). Closer to our focus, [Hotchkiss and Strickland \(2003\)](#) and [Sammon \(2022\)](#) have demonstrated the influence of firms' ownership structure on earnings response, particularly emphasizing momentum and growth investors, as well as passive investors.

Our emphasis on a different type of investors is driven by the burgeoning literature on sustainability preferences and their repercussions on asset prices. Recent research models equilibrium prices in settings where investors harbor non-pecuniary investment motives

alongside conventional cash flow preferences (e.g., [Pástor et al., 2021](#); [Pedersen et al., 2021](#); [Baker et al., 2022](#)). [Fama and French \(2007\)](#) propose that investor “tastes” exert a lasting impact on stock prices, diverging from disagreements that lead to temporary mispricing. [Goldstein et al. \(2022\)](#) anticipate that sustainable investors can render stock prices less informative about cash flows. Our empirical findings validate these predictions by illustrating both the diminished initial response to cash flow news and its persistence over time.

In related work, [Cao et al. \(2023\)](#) employ a similar ownership metric and find that the SUE signal predicts higher future returns in stocks held by socially responsible investors. However, they do not examine the announcement-day effects, as they initiate their investment strategy up to three months after the announcement. Consequently, their empirical design does not capture the disparities in immediate earnings news responses, hindering a comprehensive comparison with longer-term responses.

Finally, [Starks et al. \(2023\)](#) demonstrate that sustainable investors typically exhibit longer investment horizons and are less inclined to sell stocks following negative earnings news. In contrast, our study places a direct focus on sustainability preferences and their influence on stock prices. Our findings maintain their robustness even when accounting for the influence of investment horizons and apply consistently to both positive and negative news, aligning with the preference channel.

2 Data and Methodology

Our primary dataset is compiled from eight distinct data sources. We provide a concise overview of the dataset construction process here, with more detailed information available

in subsequent sections.

We begin by utilizing three distinct stock-level ESG-score datasets – MSCI ESG, MSCI KLD, and Refinitiv ESG – to formulate a measure of a firm’s sustainability. We then link these stock-level sustainability measures with Thompson Reuters Institutional (13F) Holdings data. This linkage allows us to compute sustainability measures at the investor portfolio level and identify investors with pronounced sustainability preferences. As institutional holdings are observed on a quarterly basis, this procedure enables us to calculate the extent of sustainable ownership for each stock at a quarterly frequency.

Subsequently, we obtain earnings announcement data, including announcement dates and earnings estimates, from IBES, following established protocols outlined in prior research (e.g., [Sammon, 2022](#)). To quantify earnings surprise, we employ the methodology outlined in [Novy-Marx \(2015\)](#). We merge the earnings announcement data with the sustainable ownership data, resulting in a combined dataset that captures the level of sustainable ownership in the calendar quarter of the announcement. This dataset is further enriched with daily stock return data from the CRSP Stock File and stock characteristics sourced from Compustat.

2.1 ESG Data

We incorporate firm-level ESG scores from three reputable rating providers: MSCI ESG, MSCI KLD and Refinitiv ESG (formerly Thomson Reuters Asset4).² MSCI ESG, the most recent and comprehensive offering by MSCI, is widely utilized by both researchers and practitioners. Its coverage predominantly extends from 2007 to 2022, with a substantial increase

²Each of these datasets is well-established in financial economics and accounting research, as evidenced by their widespread usage in previous studies. For example, Refinitiv is used by [Serafeim and Yoon \(2022\)](#). MSCI KLD is used by [Starks et al. \(2023\)](#) and by [Cao et al. \(2023\)](#). MSCI ESG is used by [Pástor et al. \(2022\)](#), [Pástor et al. \(2023\)](#) and by [Serafeim and Yoon \(2022\)](#).

in the number of covered companies in 2012 (Pástor et al. (2022)).

MSCI KLD, on the other hand, is an older legacy dataset compiled by MSCI. It stands out due to its extensive coverage, spanning from 1984 to 2021. This dataset offers two distinct advantages: its historical depth allows for the evaluation of investor preferences in earlier periods, and its widespread use in prior studies (e.g., Starks et al. (2023) and Cao et al. (2023)) facilitates meaningful comparisons with existing research.

Refinitiv ESG, covering the period from 2003 to 2022, is constructed by Thomson Reuters Refinitiv, providing a valuable alternative perspective. Using data from multiple providers helps mitigate concerns regarding the variation in ESG ratings across different sources (Berg et al. (2022)). Notably, the pairwise correlations among the three ESG ratings we employ never exceed 0.55. By examining the consistency of our results across these diverse ESG ratings, we can assess the degree to which our findings depend on the specific dataset chosen for analysis.

The various datasets we utilize employ different scoring systems for ESG assessment:

1. MSCI ESG provides a total ESG score that ranges from 0 to 10.
2. Refinitiv ESG offers a total rating that spans from 0 to 100.
3. MSCI KLD does not offer a total score but instead provides separate scores for ESG strengths and concerns, which are derived from assessments of a company's impact on the environment, social factors (community, diversity, employee relations, and human rights), and corporate governance. These scores are assigned values of 1 or 0 for positive performance indicators ("strengths") and -1 or 0 for negative performance indicators ("concerns"). To create a unified score for MSCI KLD, we employ the aggregation procedure outlined in Starks et al. (2023). Subsequently, we apply linear transformations to the MSCI KLD and Refinitiv

scores to standardize them on a scale ranging from 0 to 100. This standardization facilitates direct comparisons across datasets.

Furthermore, the availability of scores varies by frequency:

- MSCI KLD and Refinitiv ESG report scores on an annual basis only. Consequently, we use the ESG score from the year preceding the fiscal year of the announcement date for these two datasets. In our robustness tests, we also use the score from the year preceding the calendar year of the announcement day.

- MSCI ESG, while reporting data on a monthly frequency, updates the actual ESG score less frequently. In line with the approach outlined in [Pástor et al. \(2022\)](#), we use the most recent MSCI ESG score available prior to the announcement date.

2.2 Sustainable Ownership

We follow four steps to calculate the sustainable ownership *Sustainable Ownership*_{*n,t*} for stock *n* in quarter *t*. First, using firm-level ESG scores *esg*_{*n,t*}, we construct the market-adjusted ESG score, *ESG*_{*n,t*} of firm *n* in quarter *t* following the the procedure in [Pástor et al. \(2022\)](#):

$$ESG_{n,t} = esg_{n,t} - \overline{esg}_t \tag{1}$$

where \overline{esg}_t is the value-weighted average of *esg*_{*n,t*} across all firms in quarter *t*.

Second, using the market-adjusted firm-level ESG scores *ESG*_{*n,t*}, we compute a measure of an investor’s preference for sustainability for each 13F institution. This investor-level sustainability score *ESG*_{*i,t*} is determined as a value-weighted average of the ESG scores of all the portfolio stocks that have available ESG scores at the conclusion of each quarter:

$$ESG_{i,t} = \sum_n w_{i,t}(n) ESG_{n,t}. \quad (2)$$

The portfolio weights $w_{i,t}$ are given by:

$$w_{i,t}(n) = \frac{P_{n,t} \times Shares_{n,i,t}}{\sum_m P_{n,t} \times Shares_{n,i,t}}, \quad (3)$$

where $P_{n,t}$ stands for the price of stock n at the end of quarter t , and $Shares_{n,i,t}$ stands for the total number of shares held by investor i .

Third, we classify investors as sustainable. We adopt two distinct approaches for this classification to capture different dimensions of investor preferences.

Time-Invariant Definition: In this approach, we aim to establish a classification of sustainable investors that is less sensitive to short-term price fluctuations and portfolio adjustments, and that reflects the slow-moving nature of investors’ preferences. To achieve this, we calculate the time series average of $ESG_{i,t}$ for each investor, denoted as ESG_i . An investor is categorized as “sustainable” if her ESG_i falls within the top 30% of the distribution across all investors.

Time-Varying Definition: In contrast, the time-varying definition allows us to capture the dynamic nature of investor preferences. Under this definition, an investor is classified as a sustainable investor in a given quarter t if her $ESG_{i,t}$ ranks in the top 30% within that particular quarter.

Both of these definitions assess an investor’s sustainability stance relative to other investors, making them independent of broader shifts towards sustainable investing among institutional investors or trends in firms’ ESG scores (Starks (2023)). We later evaluate the

robustness of our results with respect to these definitions, examining each dataset separately, and find that they yield highly consistent outcomes.

Figure 2 depicts the time-series of portfolio-level investor ESG scores across all three datasets. It provides insights into the trends in scores for all 13F investors and for the subgroup of sustainable investors, as defined by the time-invariant criterion.

Several consistent patterns emerge from the figure. Firstly, the MSCI KLD and Refinitiv ESG datasets demonstrate a discernible upward trend in the average portfolio ESG scores, both for all investors and sustainable investors. These trends suggest that both investors and firms are increasingly focusing on sustainability considerations. Furthermore, the gap between sustainable investors and other investors widens over time, with sustainable investors experiencing a more rapid increase in their average portfolio-level ESG scores. This finding suggests that the most sustainable investors are intensifying their sustainability preferences. Notably, the MSCI ESG data exhibit a decline in portfolio-level ESG scores after 2012, coinciding with MSCI's decision to expand their coverage and incorporate more firms into their dataset (Pástor et al. (2022)). Subsequently, the data from MSCI ESG show a consistent rise in scores, along with an expanding gap between the two investor groups, aligning with the trends observed in the other two datasets.

Secondly, Figure 2 underscores the substantial differences in absolute scores among the datasets, which persist even after standardizing all scores on a 0-to-100 scale. These disparities likely stem from variations in methodologies employed by different data providers or by the same provider over time, as highlighted by Berg et al. (2022). This result emphasizes the critical importance of utilizing multiple datasets from various providers, as the ESG score is inherently subjective and contingent on provider-specific techniques and definitions.

As a final step, we compute the total amount of sustainable ownership, denoted as *Sustainable Ownership* $_{n,t}$, for each stock-quarter. This metric quantifies the sustainable ownership of a stock in a specific quarter and is calculated as the total number of shares held by sustainable investors divided by the total shares outstanding in that quarter. It's important to note that the amount of sustainable ownership is always time-varying, even when employing the time-invariant definition of sustainable investors.³

Figure 3 illustrates the temporal trends in two key statistics that assess the role of sustainable investors. Panel (a) shows the ratio of assets under management (AUM) managed by sustainable investors to the total AUM of all 13F investors. The results indicate that sustainable investors have managed approximately 10%-15% of institutional assets over the past decade, with specific estimates varying by dataset. MSCI KLD and Refinitiv ESG datasets provide the upper end of this range, while the estimate from MSCI ESG falls toward the lower end.

Panel (b) displays the dynamics of sustainable ownership, averaged across stocks. The average amount of sustainable ownership for individual stocks typically ranges between 3% and 5% over the same time period, with the largest estimate coming from Refinitiv ESG and the smallest from MSCI KLD.

Furthermore, we observe either an increasing trend (in the case of MSCI ESG) or a non-declining trend (in the case of MSCI KLD and Refinitiv ESG) in both the relative AUM of sustainable investors and the amount of sustainable ownership.⁴ When combined

³In our robustness tests, we also normalize the number of shares held by sustainable investors by the total shares held by all institutions to mitigate potential confounding effects arising from variations in institutional ownership. We find that our results remain unaffected by this scaling choice.

⁴A notable drop in sustainable AUM and ownership, as observed in MSCI ESG data, can be attributed to the departure of a small subset of sustainable investors from the dataset. The primary driver is the acquisition of Barclays Global Investors (BGI) Unit by BlackRock from Barclays in 2009, leading to Barclays' exit from

with the evidence of increasing ESG scores from Figure 2, these observations yield two key insights. First, the aggregate capital allocated by the most sustainable investors toward sustainable stocks may not have experienced a significant increase. Second, there has been an escalation in the intensity of sustainable investing over time, driven by a more focused approach to active portfolio selection. These interpretations align with the findings of [Pástor et al. \(2023\)](#), who, using an alternative methodology, demonstrate that while the absolute portfolio tilts toward green investing may not have increased, the relative tilts concerning the active share have indeed risen.⁵

2.3 Earnings Announcement Data

2.3.1 Measuring Earning Surprises

We source our earnings announcement data from the IBES unadjusted detail file. To pinpoint the moment when investors could first trade based on earnings information, we utilize the earnings release times provided by IBES. Our methodology for determining the earnings date is as follows:

- **Earnings Released on a Trading Day (Monday to Friday) before 4:00 PM ET:** In this scenario, we designate the same day as the earnings date.
- **Earnings Released on a Trading Day (Monday to Friday) at or after 4:00 PM ET:** In this case, we assign the subsequent trading day as the earnings date.

the dataset. BGI, which encompassed the iShares ETF unit, had a substantial \$1.85 trillion in assets under management prior to the acquisition. Our findings remain consistent regardless of whether we categorize Barclays as a sustainable investor or entirely exclude its holdings from the dataset.

⁵It's important to emphasize that our results focus on the ownership of the most sustainable investors based on distributional cutoffs relative to other investors and may not reflect the broader trend toward sustainability observed among all investors ([Starks \(2023\)](#)).

- **Earnings Released on a Weekend or a Trading Holiday:** If earnings are made public over the weekend or on a trading holiday, we exclude the announcement event from our sample.

By adhering to this procedure, we ensure that our analysis only encompasses earnings announcements for which investors had the opportunity to trade on earnings information, taking into account variations in release times and trading hours.

We calculate standardized unexpected earnings (SUE) to categorize earnings announcements as either positive or negative news events. We follow [Novy-Marx \(2015\)](#) and define SUE as:

$$SUE_{n,t} = \frac{EPS_{n,t} - EPS_{n,t-4}}{\sigma_{t-1,t-8}(EPS_{n,t} - EPS_{n,t-4})}, \quad (4)$$

where $EPS_{n,t}$ is the quarterly earnings per share from IBES in quarter t , $EPS_{n,t-4}$ is the quarterly earnings per share in quarter $t-4$ (a year before), and $\sigma_{t-1,t-8}(EPS_{n,t} - EPS_{n,t-4})$ is the standard deviation of the year-on-year changes in the EPS over the past 8 quarters.⁶

We match CRSP to IBES, keeping only the U.S. common stocks (share codes 10 and 11). The resulting sample includes 400,906 announcements from 12,603 companies from 1992Q3 to 2022Q2.

⁶The actual realized earnings per share (EPS), often referred to as “street earnings,” is a measure of actual earnings that is commonly used in financial reporting. It differs from the Generally Accepted Accounting Principles (GAAP) earnings in that it excludes certain expenses and items that are considered nonrecurring or extraordinary in nature. Managers frequently rely on street earnings because they provide a more accurate reflection of the company’s ongoing operational performance ([Bradshaw and Sloan \(2002\)](#)). When financial analysts make earnings forecasts, their primary aim is typically to predict this street earnings measure.

2.3.2 Measuring Response to Earnings News

We employ multiple metrics to evaluate the stock price response to earnings announcements. The first two measures we consider are the announcement-day abnormal stock return and the post-announcement cumulative abnormal return. These measures quantify the immediate and delayed responses to earnings.

Immediate and Delayed Price Response. We follow the approach from [DellaVigna and Pollet \(2009\)](#) to calculate abnormal returns for different windows around the announcement date. Let $R_{n,d}$ and $R_{m,d}$ denote the return of stock n and the return of the market on day d , respectively. We obtain $R_{n,d}$ from the CRSP daily stock file and $R_{m,d}$ from the Kenneth French’s website. We first estimate market betas for stock n in quarter t using the following regression specification:

$$R_{n,d} = \alpha_{n,t} + \beta_{n,t}R_{m,d} + \epsilon_{n,t}. \quad (5)$$

We estimate equation (5) using daily data which starts 300 days prior to the announcement and ends 46 trading days (2 trading months) before the announcement. For each stock-announcement quarter, we thus include daily observations where $d \in [\tau - 300; \tau - 46]$ with τ being the date of the announcement in quarter t .

We next define the buy-and-hold abnormal return for stock n in quarter t over the period $(\tau + h, \tau + H)$ as:

$$R_{n,t}^{(h,H)} = \left[\prod_{d=\tau+h}^{\tau+H} (1 + R_{n,d}) \right] - 1 - \widehat{\beta}_{n,t} \left[\prod_{d=\tau+h}^{\tau+H} (1 + R_{m,d}) - 1 \right], \quad (6)$$

where $\widehat{\beta}_{n,t}$ is the estimate of the stock’s market beta from equation (5). Using equation (6), we calculate the announcement-day return as $R_{n,t}^{(0,0)}$ (i.e., $h = H = 0$) as a measure of the immediate stock price response. In our main analyses, we define the delayed response as $R_{n,t}^{(1,22)}$ - the cumulative return over the 22 trading days, starting with the day after the announcement. Finally, we winsorize observations with returns at the top and bottom 1% of the distribution within each quarter.

Normalized Delayed Response. We also use the following normalized measure of delayed response $NDR_{n,t}$:

$$NDR_{n,t} = \begin{cases} \frac{1+R_{n,t}^{(1,22)}}{1+R_{n,t}^{(0,22)}}, & R_{n,t}^{(0,0)} > 0, \\ \frac{1+R_{n,t}^{(0,22)}}{1+R_{n,t}^{(1,22)}}, & R_{n,t}^{(0,0)} < 0. \end{cases} \quad (7)$$

The basic idea is to capture the delayed response after the announcement day relative to the total price response. For example, if the entire price response occurs after the announcement day, $NDR_{n,t}$ takes on its maximum value of one, suggesting that the entire price response is delayed. $NDR_{n,t}$ instead declines as the price response on the announcement day becomes larger relative to delayed response. The NDR is a useful metric because it allows us to compare the timing of price responses across different stocks, irrespective of the absolute differences in the magnitudes of the immediate and delayed responses.⁷

Trading Volume. Our final measure of earnings response is the change in trading

⁷DellaVigna and Pollet (2009) use a similar measure to study the response to earnings, while Sammon (2022) employs it to examine the magnitudes of the pre-earnings price drift.

volume. We follow [DellaVigna and Pollet \(2009\)](#) and compute it as:

$$\Delta v_{n,t}^{(h,H)} = \sum_{u=\tau+h}^{\tau+H} \log(V_{n,t}^u) / (H - h + 1) - \sum_{u=\tau-20}^{\tau-11} \log(V_{n,t}^u) / 10, \quad (8)$$

where $V_{t,k}^u$ is the value of shares traded on day u and τ is the date of the earnings announcement in quarter t for stock n . The measure $\Delta v_{t,k}^{(h,H)}$ is the percentage increase in volume around announcement date at horizon (h, H) , relative to the 10-day window from day 20 to day 11 prior to the announcement. We focus on the effects on $\Delta v_{n,t}^{(0,0)}$ which represents the immediate increase in abnormal trading volume on the announcement.

3 Main Results

To evaluate the impact of sustainable ownership on stock prices in response to earnings announcements, we categorize these announcements into 11 quantiles based on the magnitude of earnings surprises $SUE_{n,t}$. Events with negative and positive earnings surprises are divided into 5 equal-size groups each, with thresholds calculated separately for each quarter. Events with zero earnings surprises are classified into a distinct group. Consequently, negative earning surprises fall into quantiles 1 through 5, zero surprises occupy quantile 6, and positive surprises are found in quantiles 7 through 11. This categorization allows us to explore the influence of sustainable ownership across a spectrum of earnings surprises, comparing the response to negative and positive news.

3.1 Graphical Evidence for Differences in Immediate Response

We begin by visually analyzing the immediate stock price responses to earnings announcements, distinguishing between stocks with high and low sustainable ownership. Stocks are classified into these two groups based on whether their sustainable ownership levels fall within the top or bottom 30% of the distribution for a given quarter. For each group, we calculate the average announcement-day return across various quantiles of earnings surprises.

The findings, as depicted in Figure 1, reveal a noteworthy difference: stocks with high sustainable ownership exhibit a weaker response to earnings news. This underreaction is evident for both positive and negative earnings announcements. Importantly, the statistical significance of these differences is confirmed by the 95% confidence intervals. These results hold consistently across all three datasets and are evident across a wide range of earnings surprise magnitudes. The only exceptions are the middle quantiles, which represent minimal or zero earnings surprises. In such cases, where the impact of cash flow news is minimal, both groups of stocks exhibit price responses close to zero, as expected.

3.2 Methodology for Estimating Effects of Sustainable Ownership

We proceed by employing a set of regression specifications to provide a formal quantification of the patterns observed in Figure 1. Additionally, we aim to estimate the effects on various other outcomes. Notably, the graphical findings suggest that the disparities between stocks become more prominent when the cash flow news is more substantial. Building on this insight, we adopt an approach inspired by [DellaVigna and Pollet \(2009\)](#) and investigate how different stocks respond to strongly positive news in comparison to strongly negative news.

To examine events with strongly positive and negative earnings surprises, we employ two distinct sampling approaches. In the first approach, we select events from quantile 1 (representing strong negative surprises) and quantile 11 (representing strong positive surprises). In the second approach, we include events from quantiles 1 and 2 for strong negative surprises, and from quantiles 11 and 12 for strong positive surprises. When adopting the second approach, the total number of announcements approximately doubles, relative to the first approach.

The choice between these sampling methods involves a trade-off between the precision of the estimates and the expected effect size. Including additional quantiles results in a larger sample size, enhancing the precision of statistical tests. However, it may also lead to smaller effect sizes because observations with weaker expected price responses to earnings are included. Given the uncertainty about which sampling method offers greater statistical power, we employ both approaches in our analyses to ensure comprehensive coverage and robust results. The summary statistics for all the variables used in our study across three datasets and two sampling approaches are presented in Appendix Tables [A.1](#) - [A.3](#).

We next estimate the following regression specification:

$$y_{n,t} = \psi_n + \psi_t + \phi_1 \mathbb{1}_{n,t}^{TopSUE} + \phi_2 \mathbb{1}_{n,t}^{HighSustOwn} + \phi_3 \left(\mathbb{1}_{n,t}^{TopSUE} \times \mathbb{1}_{n,t}^{HighSustOwn} \right) + \Gamma X_{n,t} + \varepsilon_{n,t}. \quad (9)$$

In this specification, $y_{n,t}$ denotes the outcome variable for stock n in quarter t . Depending on the sampling approach, the sample only includes the observations from the top and the bottom quantiles (1 and 11) or the top two and the bottom two quantiles (1 and 2, together with 10 and 11). The indicator $\mathbb{1}_{n,t}^{TopSUE}$ equals one if the observation belongs to the top SUE quantile(s) and zero if it belongs to the bottom SUE quantile(s).

To capture the differences in the effects of sustainable ownership, we adopt an approach similar to that depicted in Figure 1. We focus on stocks with sufficiently high and low levels of sustainable ownership, introducing an indicator variable, $\mathbb{1}_{n,t}^{HighSustOwn}$, which equals one if the stock’s sustainable ownership level falls within the top 30% of the distribution and zero if it falls within the bottom 30%. This approach simplifies the interpretation of the coefficients, and facilitates a meaningful comparison with the initial graphical findings. In all our analyses, we also directly utilize the continuous measure of sustainable ownership, $Sustainable\ Ownership_{n,t}$, to assess how the results respond to variations in the definition of the measure.

The main coefficient of interest is ϕ_3 - the coefficient on the interaction between $\mathbb{1}_{n,t}^{TopSUE}$ and $\mathbb{1}_{n,t}^{HighSustOwn}$. It is interpreted as the additional marginal effect of sustainable ownership for the events with positive earning news, relative to the events with negative earnings news. The coefficient on $\mathbb{1}_{n,t}^{TopSUE}$, ϕ_1 , measures the baseline relative effect of positive earnings news for stocks with low sustainable ownership. Under the null hypothesis of no differences between the stocks, ϕ_3 equals zero. Under the alternative hypothesis where sustainable investors react to cash flow news differently, ϕ_3 can be either positive or negative.

Our regression specifications incorporate a vector of control variables, denoted as $X_{n,t}$, to account for other factors that may influence returns and trading volume, as documented in previous research. Specifically, we include the natural logarithm of the stock’s market capitalization, its book-to-market ratio, the natural logarithm of the number of analysts covering the stock, and the natural logarithm of the number of earnings announcements made by other firms on the same day.

In line with the approach outlined in [Hirshleifer and Sheng \(2022\)](#), we introduce two

additional control variables. Firstly, we control for the impact of overall market returns on the announcement day by incorporating an indicator variable that equals one when the market return is in the top 10% of its daily return distribution across the sample period. Secondly, we include an indicator variable to account for days featuring macroeconomic news announcements, thus controlling for the effects of macro news.

Figure 1 effectively demonstrates that the magnitude of earnings surprises (as depicted by the quantile means on the X-axis) for stocks with low and high sustainable ownership are quite similar. Thus, it is unlikely that these results are driven by disparities in the magnitude of the surprise across stocks.⁸ Nevertheless, to account for any potential differences in the magnitude of earnings surprise ($SUE_{n,t}$) between stocks, we include it as an additional control variable in our analyses.

Our regression specifications also incorporate a set of fixed effects to account for various factors that may influence our outcomes. The quarter fixed effect ψ_t adjusts for quarter-specific fluctuations in outcomes, capturing any variations that may be specific to certain quarters. The stock fixed effect ψ_n helps control for unobserved, slow-moving stock-specific confounding factors. These factors can include industry-specific effects or idiosyncratic characteristics of individual stocks. We also include the day of the week fixed effect to control for the possibility of differential responses to earnings announcements on different weekdays, including phenomena like the “Friday effect” as documented by [DellaVigna and Pollet \(2009\)](#). Finally, we add the calendar month fixed effect to accounts for any seasonality effects in earnings announcements and their impact on stock market outcomes. In all our tests, standard

⁸To formally substantiate this claim, in Panel A of Table A.4, we investigate the differences in the average magnitudes of the earnings surprise between stocks with high and low sustainable ownership. Across all datasets, the results indicate that the difference in the average magnitudes of earnings surprises is economically small and statistically insignificant for both top SUE and bottom SUE events. The only exception is a positive difference for the top SUE events in the MSCI KLD data.

errors are double-clustered by stock and quarter.

3.3 Sustainable Ownership and Immediate Response to Earnings

Table 1 presents the results from estimating Equation 9 with the announcement-day abnormal return $R_{n,t}^{(0,0)}$ as an outcome variable. Panels A, B and C present the results from MSCI ESG, MSCI KLD and Refinitiv data, respectively.

Starting with Panel A for MSCI ESG data, column (1) presents the results from the baseline estimation with no control variables. The coefficient on $\mathbb{1}_{n,t}^{TopSUE}$ suggests that stocks with low sustainable ownership experience a 4.5 percentage point higher announcement-day return following positive cash flow news compared to negative cash flow news. The coefficient on the interaction term, $\mathbb{1}_{n,t}^{TopSUE} \times \mathbb{1}_{n,t}^{HighSustOwn}$, is -1.2% , indicating that the return differential between positive and negative news is reduced by 26% ($1.2\%/4.6\%$) for stocks with high sustainable ownership,

The inclusion of quarter and stock fixed effects in column (2) does not significantly alter these estimates. However, the introduction of more control variables in column (3) reduces the baseline effect for stocks with low sustainable ownership to a mere 2.7%. Intriguingly, the incremental effect of sustainable ownership remains consistent at -1.2% . This result suggests that sustainable ownership diminishes the immediate response to earnings by 44% ($1.2\%/2.7\%$). The findings in column (4) from the sample with additional quantiles substantiate this effect, showcasing a similar magnitude of 45% ($1\%/2.2\%$). For the sake of conciseness, we do not present the direct effects of the control variables in the main tables, but they are detailed in Appendix Tables A.5 - A.7.

The estimates of the effects of sustainable ownership from the MSCI KLD and Refinitiv

datasets are strikingly consistent with those from MSCI ESG. In column (3) of Panels B and C, the results indicate a reduction in announcement day returns of 53% (1.6%/3.0%) and 58% (1.7%/2.9%), respectively. Furthermore, the estimates from the larger samples in column (4) exhibit similar economic magnitudes of 59% (1.3%/2.2%) and 58% (1.4%/2.4%). This uniformity across datasets underscores the robustness of our findings to the choice of ESG data source.

In columns (5) and (6), we adopt a specification using the continuous variable *Sustainable Ownership* $_{n,t}$ instead of the discrete indicator $\mathbb{1}_{n,t}^{HighSustOwn}$. Column (5) demonstrates that the influence of sustainable ownership remains negative and statistically significant in the small two-quantile samples for MSCI KLD and Refinitiv. In the larger four-quantile samples, column (6) confirms that the effects of sustainable ownership are statistically significant across all three datasets. Overall, this alternative specification reinforces the consistency of our results.

To summarize, our findings, derived from three distinct datasets using two different sustainable ownership definitions and two sampling methods, consistently demonstrate that sustainable ownership significantly diminishes the immediate stock price response to earnings news. This core result suggests a reduced reliance on expected cash flows as a determining factor for stock prices. Moreover, our basic robustness tests further strengthen these findings. Appendix Tables [A.8](#) and [A.9](#) demonstrate that our results hold when we modify the method of computing sustainable ownership by considering the total number of shares held by institutions rather than total shares outstanding, and when assigning ESG scores based on the next calendar year rather than the next fiscal year.

3.4 Sustainable Ownership and Delayed Response to Earnings

We next focus on the effects on price dynamics in the post announcement period. Figure 4 presents the cumulative abnormal returns $R_{n,t}^{(h,H)}$ over the first month after the announcement, separately for high and low sustainable ownership stocks and separately for positive and negative news. The day 0 represents the announcement day.

First, we can clearly observe the basic effects of sustainable ownership on the immediate response. For example, panel (a) (MSCI ESG data) shows that the difference in response to news for stocks with low sustainable ownership equals nearly 4.5%. The same difference is much smaller for the stocks with high sustainable ownership being equal to around 3.2%. These graphical results put the effect of sustainable ownership at approximately -1.3% (3.2%-4.5%) with the relative magnitude being equal -28% (-1.3%/4.5%). This estimate is roughly equal to the results from the specification with no controls from column (1) of Table 1.

Second, this differential effect persists throughout the post-announcement month, indicating that the influence of sustainable investors on stock prices endures beyond the announcement day. In some cases, especially for negative news and specific datasets like MSCI KLD and Refinitiv, the gap between the two groups of stocks even widens during the post-announcement period. This finding suggests that the initial underreaction to news, influenced by sustainable ownership, is not transitory but rather a new lasting feature of the market landscape.

To further explore and quantify the prolonged effects of sustainable ownership on stock prices after earnings announcements, we turn to the delayed response, as captured by the variable $R_{n,t}^{(1,22)}$. This approach allows us to gauge how sustainable ownership influences stock prices in the subsequent 22 trading days following the announcement. We utilize the same

specifications as presented in Equation 9 to maintain consistency with the methodologies employed in previous analyses. In our discussion below, we focus on the twelve specifications in columns (3)-(6) across panels A, B, and C, which take into account all relevant control variables and encompass variations in datasets, definitions of sustainable ownership, and samples of earnings announcements.

The findings from Table 2 corroborate the graphical evidence, indicating that the initial underreaction to cash flow news persists after the earnings announcement. However, the question of whether prices diverge further after the announcement remains somewhat contingent on how sustainable ownership is defined.

For all specifications employing the discrete definition, the results consistently suggest that sustainable ownership weakens the delayed response, implying further divergence in prices. For instance, in column (4) of Panel B, the coefficient on $\mathbb{1}_{n,t}^{TopSUE}$ equals 0.009, signifying an additional difference of 0.9 percentage points in returns between low sustainable ownership stocks with positive and negative news after the announcement. The coefficient on the interaction, which equals -0.007 , suggests that the post-announcement return is 77% (0.7%/0.9%) smaller for stocks with high sustainable ownership, further supporting the notion of prices diverging.

Conversely, the results from specifications utilizing the continuous measure of sustainable ownership in columns (5) and (6) yield mixed outcomes in terms of economic significance, albeit a consistent picture in terms of economic magnitude. E.g., the MSCI ESG data suggests a lack of the effect (i.e., neither divergence nor convergence), while the MSCI KLD data implies further divergence. Refinitiv data depicts mixed results depending on the sample of earnings announcements. Importantly, however, the consistently negative coefficient on

the interaction term in all specifications strongly supports the absence of price convergence.

In summary, the findings suggest that the disparity in the immediate response to earnings is not corrected over time and may even intensify in the post-announcement period. Sustainable ownership not only dampens the immediate reaction to earnings but also perpetuates this effect in the subsequent trading days. The lasting alteration in price formation indicates that the effect is driven by shifts in investor preferences rather than an oversight of information. Furthermore, this effect is not indicative of a transient mispricing since it remains uncorrected, thereby rejecting the notion of arbitrage opportunities.

3.4.1 Day-by-Day Estimations

To further scrutinize this interpretation, we estimate the specification using cumulative returns over various post-announcement periods, rather than focusing only on the announcement-day or the entire 22-day returns. In particular, we conduct a “day-by-day” analysis, using multiple versions of Equation 9 with $R_{n,t}^{(0,H)}$ for different values of H (ranging from 0 to 22) as outcome variables. Figure 5 presents the main interaction coefficients on the Y-axis and H (the number of post-announcement trading days used to measure the returns) on the X-axis.

The results from the three datasets not only confirm that prices do not converge but also illustrate the absence of any short-term reversals within the entire post-announcement period. All the point estimates are statistically significantly different from zero, affirming the strong underreaction. The point estimates steadily decrease over time, suggesting further price divergence. However, the 95% confidence intervals overlap across most of the estimates, implying that, for instance, the effect on 2-day cumulative returns is not significantly different from the effect in 22-day cumulative returns. These patterns are consistent with the mixed

results on the effects on the entire 22-day return from Table 2, suggesting limited statistical power to detect further divergence in prices.

3.4.2 Effects on Normalized Delayed Response

As an additional validation test, we examine the effects of sustainable ownership on an alternative measure - the normalized delayed response ($NDR_{n,t}$). Using this measure offers two advantages. First, it allows us to account for the possibility that stocks may have different long-term responses to earnings due to unobserved characteristics. Second, it helps us estimate whether sustainable ownership affects the fraction of response that is delayed, rather than the total amount of the delayed response.

Table 3 reports mixed results, which are very similar to the findings on the absolute amount of delayed response. Specifically, the results from MSCI KLD and Refinitiv datasets suggest a weaker delayed response (i.e. further divergence), while the findings from MSCI ESG point to the lack of convergence. These results suggest that our conclusions do not depend on how we measure the delayed response, further supporting the robustness of our findings.

3.5 Sustainable Ownership and Trading Volume

Our last primary outcome measure is the trading volume on the announcement day. This analysis serves two main purposes. First, it helps validate the effects observed on immediate and delayed stock returns. If the previously documented effects on returns stem from differences in investor preferences, and trading is the mechanism that causes prices to adjust, then we would expect a similar reduction in trading volume. Second, this analysis allows us to

address an alternative explanation: that differences in response arise from variations in cash flow expectations (i.e., “dispersion of opinions”) between investors rather than differences in preferences for sustainability. Theory predicts that an increase in opinion dispersion would lead to higher trading volume (Harris and Raviv (1993)). If sustainable investors have different cash flow expectations, we would expect greater announcement-day volume for stocks with high sustainable ownership.

The results in Table 4 consistently show a decline in trading volume. The estimated effects of sustainable ownership are negative in all twelve specifications and statistically significant in ten of them. Quantitatively, the absolute decline in volume ranges from 6.8% (column (3) in Panel A) to 11.2% (column (3) in Panel C) when we apply the discrete definition of sustainable ownership. The baseline increase in volume from positive news for stocks with low sustainable ownership stands at 8.9% and goes up to 13.4% in the same specifications. Together, this suggests that sustainable ownership reduces announcement-day trading volume by nearly 76% (6.8%/8.9%) and up to 83% (11.2%/13.4%). The estimates from other specifications deliver comparable economic magnitudes. In all, these results are consistent with our earlier findings on returns and provide support for the preferences channel.

4 Robustness and Validation Tests

4.1 Time-Varying Investor Preferences

We conduct robustness and validation tests to assess the stability of our results. First, we examine whether our findings hold when using an alternative definition of sustainable

ownership that considers short-term variations in preferences, as discussed in Section 2.2. In all these tests, we employ the discrete definition of sustainable ownership and the two-quantile sampling approach.

Table 5 summarizes the results, focusing on the main interaction coefficients across three datasets and four outcome variables. In column (1), we find that the effects on the immediate response are consistently negative, statistically significant, and of similar magnitudes to the baseline difference between high and low sustainable ownership stocks (around 1.5%). Columns (2) and (3) presents the results on the delayed response, confirming that the initial effect persists in subsequent trading days. Column (4) reveals a 5%-10% absolute decline in trading volume, which is again comparable to the main results.

Overall, our findings remain robust when accounting for time variation in investor preferences. Additionally, in Appendix Figures A.1 and A.2 we reproduce the main graphical evidence from Figures 1 and 4 using this alternative definition of sustainable ownership. We confirm that these graphical results align with our baseline findings.

4.2 Effects of Investor Horizon

We proceed to investigate whether the effects of investor horizon could confound our results. A study by [Starks et al. \(2023\)](#) finds that investors with long-term horizons tend to exhibit more patience toward the sustainable firms in their portfolios. In particular, long-horizon investors are less likely to sell these stocks even after experiencing negative earnings surprises. This evidence could alter our interpretation, suggesting that it is investor patience rather than their preferences for sustainability that drives the weak response to news.

First, it's essential to clarify the conceptual distinctions between the preference and

patience channels. Our findings indicate a comparable underreaction to both positive and negative cash flow news. However, the patience channel predicts underreaction primarily to negative news, whereas it doesn't explain the underreaction to positive news. Therefore, from a conceptual standpoint, our results align more closely with the preference channel. The underreaction to positive earnings surprises cannot be attributed to investor patience.

To further differentiate between these channels, we perform an analysis controlling for the impact of investor horizon. Following the approach outlined by [Starks et al. \(2023\)](#), we measure investment horizon using churn ratios, constructed from investor portfolio holdings ([Gaspar et al. \(2005\)](#)). Subsequently, we compute a stock-level measure for investor patience, denoted as $ChurnRatio_{n,t}$ for stock n at time t . This measure is derived as the weighted average of churn ratios for all investors holding the stock, with weights determined by the number of shares each investor holds.

We next extend the main specification from Equation 9 by incorporating two additional control variables. The first variable, $\mathbb{1}_{n,t}^{HighChurnRatio}$, is an indicator which equals one if $ChurnRatio_{n,t}$ falls within the top 30% of its within-quarter distribution and zero if $ChurnRatio_{n,t}$ is within the bottom 30%. Our second variable is an interaction term between $\mathbb{1}_{n,t}^{HighChurnRatio}$ and $\mathbb{1}_{n,t}^{TopSUE}$, which allows us to assess the influence of investor patience on the return differential between positive and negative news, mirroring our approach for sustainable ownership. If the effects of investor patience overshadow the effects of preferences for sustainability, we would expect the main coefficients (i.e., the interaction between $\mathbb{1}_{n,t}^{HighSustOwn}$ and $\mathbb{1}_{n,t}^{TopSUE}$) to diminish in size or become statistically insignificant after including these control variables in our specifications.

Table 6 demonstrates that the baseline results remain robust. The results consistently

reveal that the impact of sustainable ownership remains negative, statistically significant, and of the same magnitude as observed in the main tests (columns (1), (3), (4), (6), (7), and (9)). In columns (2), (5), and (8), we use a continuous measure of patience, denoted as $ChurnRatio_{n,t}$, in conjunction with a continuous definition of sustainable ownership. In two out of three datasets, the results remain unchanged. This cumulative evidence continues to support the preference channel, suggesting that the effects of investor patience do not interfere with our results.

4.3 Direct Effect of ESG Scores

We next investigate whether our results are primarily driven by stock ESG scores, which represent a stock’s “sustainability” characteristics. Differentiating between the direct effects of a stock’s sustainability and the effects of ownership by sustainable investors is crucial for several reasons. Firstly, if the effects we observe are indeed attributable to investor preferences, then the relevance of a stock’s ESG score will depend on its correlation with sustainable ownership. If this correlation is not perfect, then ESG scores themselves may have limited impact on prices. Secondly, there is an ongoing debate in the asset pricing literature regarding the significance of investor preferences for stock characteristics relative to the characteristics themselves (Kojen and Yogo, 2019). Therefore, our analysis serves to underscore the influence of investor preferences on the pricing of assets with “sustainability” characteristics.

We first examine the correlations between a stock’s sustainable ownership and its ESG score. The results displayed in Figure 6 indicate that while there is a positive correlation between ESG scores and sustainable ownership, it is far from perfect. The correlation is

28.1%, 40.2%, and 65.4% for the MSCI ESG, MSCI KLD, and Refinitiv datasets, respectively. This finding suggests that the effects of ESG scores on stock prices may be weaker than the effects of sustainable ownership or may not exist at all.

To explore this further, we repeat our main analysis using ESG scores instead of sustainable ownership. Specifically, we categorize firms as having high or low ESG scores based on whether they fell within the top 30% or bottom 30% of the ESG score distribution in a given quarter.⁹ Figure 7 illustrates the immediate response of stock returns to earnings surprises for firms with high and low ESG scores across 11 earnings surprise quantiles. The results show minimal differences in response between high-ESG-score and low-ESG-score firms. This figure contrasts with our baseline findings in Figure 1, which reveal a more pronounced and consistent price response difference between high and low sustainable ownership firms across various levels of earnings surprises. These findings indicate that it is ownership by sustainable investors, rather than ESG scores themselves, that primarily drives the observed price effects.

The regression analysis presented in Table 7 supports the conclusion that there is no significant difference in earnings responses between high and low ESG-score firms. Utilizing our main specification from Equation 9 with the two-quantile approach, we find that the coefficient on the interaction between the indicator for having a high ESG score and the indicator for being in the top earnings surprise quantiles is statistically insignificant and economically small. This result is consistent across all three datasets, indicating that it is not contingent on the methodology used to calculate the ESG score.

⁹Since MSCI KLD and Refinitiv report ESG scores at the yearly frequency, the stock's classification remains unchanged between quarters within a year for these two datasets. For MSCI ESG, we use the most recent available score.

4.4 Placebo Tests for 1980s and 1990s

To address the concern that sustainable and non-sustainable investors may differ along unobserved dimensions that could potentially drive our results, we devise a placebo test. In this test, we leverage the same institutional classification as in our primary analysis and examine whether ownership by sustainable investors had an impact on the response to earnings during a period before the widespread introduction of ESG ratings and the broader enthusiasm for sustainable investing.

For this placebo test, we choose the sample period from 1984Q2 to 1992Q2 because none of the three ESG datasets used in our primary analysis were available during this timeframe. During this time span, investors lack the necessary information and incentives to actively incorporate sustainability criteria into their investment decisions. Our hypothesis is straightforward: if the effects we observe in our primary analysis were predominantly driven by contemporary preferences for sustainability, then we should not find significant effects on earnings response during this “pre-sustainability” era.

The results of our placebo test, as presented in Table 8, consistently show that there is no significant difference in announcement day returns for stocks with high sustainable ownership during the pre-sustainability era. This finding holds across various specifications that encompass all three datasets, both discrete and continuous definitions of stock-level sustainable ownership, and two different samples of earning announcements. In essence, it demonstrates that stock ownership by investors classified as sustainable *after* the introduction of ESG ratings did not exert a meaningful influence on the response of returns to earnings news *before* these ratings became available. This result strengthens the argument that the observed effects in our main analysis are indeed rooted in sustainable preferences

that have become more pronounced in recent years.

5 Conclusions

This paper delves into the impact of sustainable ownership on the relationship between expected cash flows and stock prices. Utilizing data from three distinct datasets to measure preferences for sustainability, our findings reveal a significant reduction in the responsiveness of stock prices to changes in expected cash flows in the presence of sustainable ownership. Furthermore, this effect is not transitory and persists in the trading days following the arrival of cash flow news, indicating that sustainable ownership induces a lasting shift in stock prices rather than causing a fleeting mispricing.

Our study yields two key conclusions. Firstly, our results shed light on how sustainable investing can alter one of the foundational principles of traditional finance: the link between stock prices and future cash flows. This effect suggests that sustainable investing transforms the fundamental process of price formation by diminishing the significance of cash flow news, potentially in favor of other types of news that are closely tied to sustainability.

Secondly, it is essential to emphasize that our findings do not imply that sustainable investing makes stock markets less efficient. Market efficiency pertains to the speed at which prices adjust to new information, but it does not dictate which information is deemed relevant by investors. Our study highlights that investor preferences for specific stock characteristics can fundamentally reshape how information about other characteristics influences stock prices. Thus, any future assessments of market efficiency must take into account the evolving landscape of investor preferences for sustainability and its potential impact on the efficiency

of price formation.

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Tables and Figures

Figure 1: The Effect of Sustainable Ownership On the Immediate Price Response to Earnings.

This figure displays the announcement-day abnormal returns for stocks with different levels of ownership by sustainable investors. *Sustainable Ownership* is the fraction of total shares outstanding held by sustainable investors. We define an investor as *Sustainable* if their portfolio-level ESG score is at the top 30% of its distribution across all the investors. *High Sustainable Ownership* (*Low Sustainable Ownership*) stocks represent the top 30% (bottom 30%) in terms of sustainable ownership. The stocks are grouped into 11 quantiles by the level of earning surprise, measured by the standardized unexpected earnings (SUE). Quantiles 1-5 contain earnings announcements for negative SUE and quantiles 7-11 contain earnings surprises for positive SUE. Quantile 6 contains announcements with zero SUE. Each panel presents the results which use ESG scores from a different dataset - MSCI ESG, MSCI KLD and Refinitiv. Brackets are the 95% confidence intervals with standard errors double-clustered by stock and quarter.

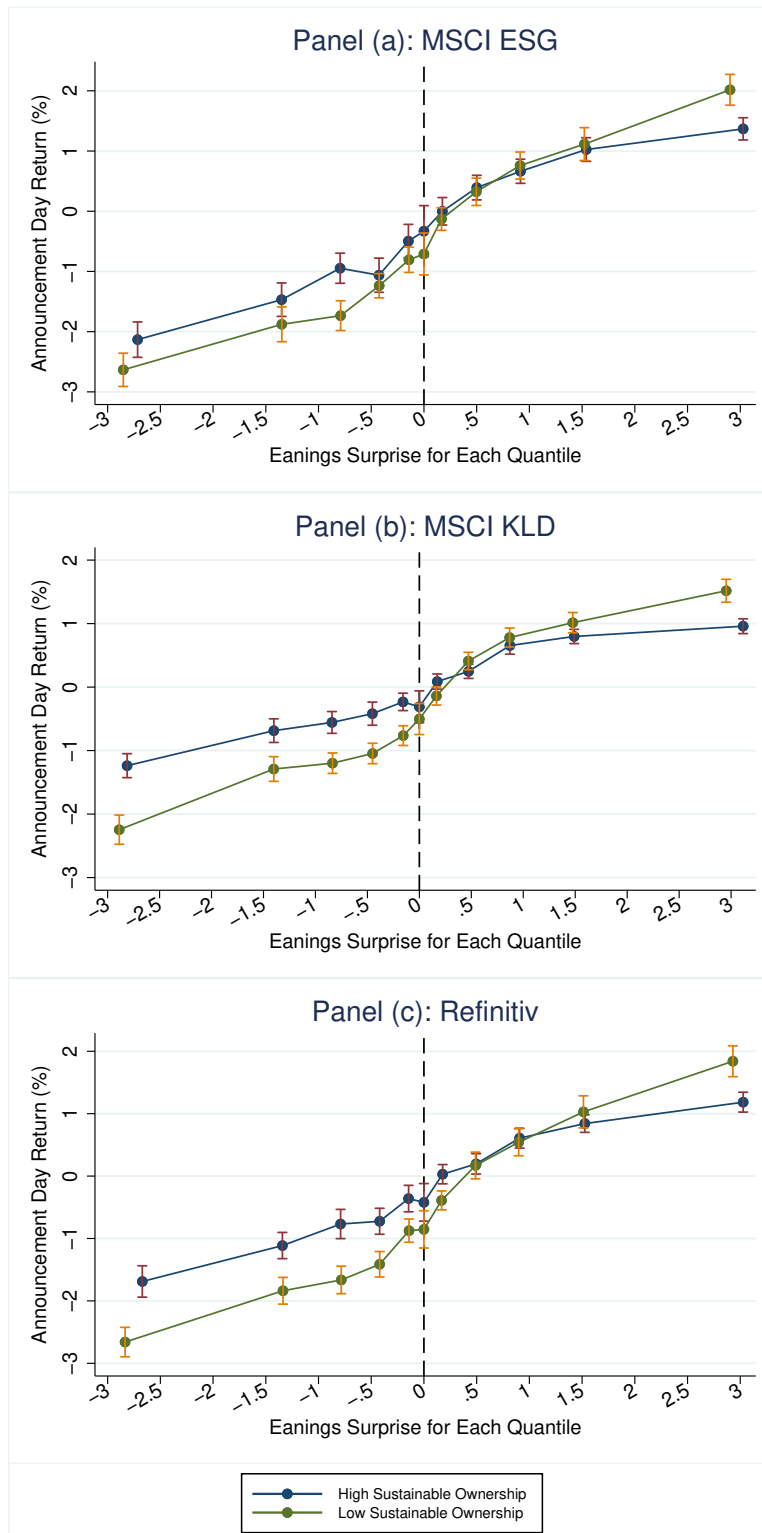


Figure 2: ESG Scores Across Datasets and Investors.

This figure displays the value-weighted ESG scores over time. The scores are calculated using three different datasets - MSCI ESG, MSCI KLD and Refinitiv. We present scores separately for all investors and for sustainable investors. We define investors as *Sustainable* if their portfolio-level ESG score is at the top 30% of its distribution across investors.

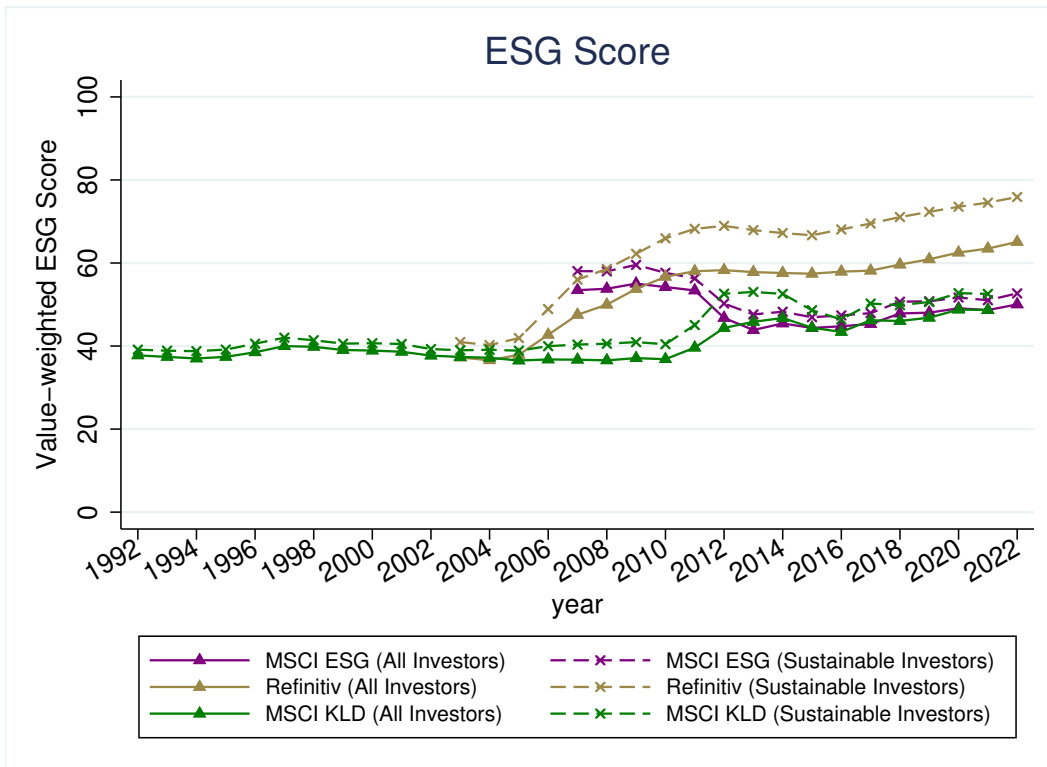


Figure 3: Sustainable AUM and Sustainable Ownership.

Panel (a) displays the amount of sustainable AUM, defined as the fraction of total institutional assets managed by sustainable investors. Panel (b) displays the amount of sustainable ownership, defined as the fraction of total shares outstanding held by sustainable investors. We define investors as *Sustainable* if their portfolio-level ESG score is at the top 30% of its distribution across investors. The scores are calculated using three different datasets - MSCI ESG, MSCI KLD and Refinitiv.



Figure 4: The Effect of Sustainable Ownership on the Post-Announcement Cumulative Returns.

This figure presents the post-announcement cumulative returns for four groups of stocks. *Sustainable Ownership* is the fraction of total shares outstanding held by sustainable investors. We define an investor as *Sustainable* if their portfolio-level ESG score is at the top 30% of its distribution across all the investors. *High Sustainable Ownership* (*Low Sustainable Ownership*) stocks represent the top 30% (bottom 30%) in terms of sustainable ownership. The earnings surprise is measured by the standardized unexpected earnings (SUE). *Top SUE* (*Bottom SUE*) stocks represent the top 10% (bottom 10%) in terms of earnings surprise during the announcement quarter. The cumulative abnormal return is the buy-and-hold return adjusted using the market model. Each panel presents the results which use ESG scores from a different dataset - MSCI ESG, MSCI KLD and Refinitiv. Brackets are the 95% confidence intervals with standard errors double-clustered by stock and quarter.

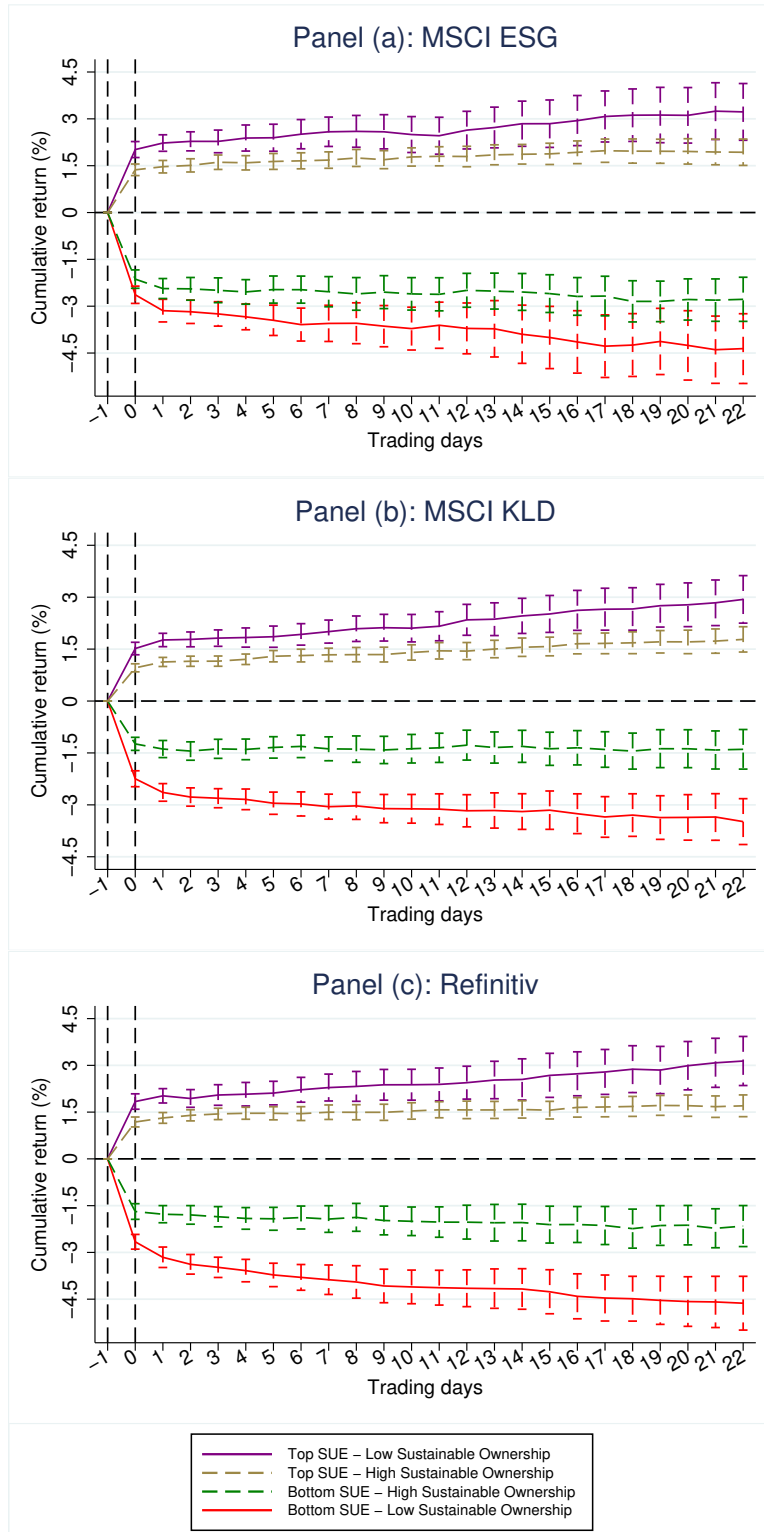


Figure 5: The Day-by-Day Estimates of the Effect on the Post-Announcement Cumulative Returns.

This figure presents the estimates of ϕ_3 from the following specification:

$$R_{n,t}^{(0,H)} = \psi_n + \psi_t + \phi_1 \mathbb{1}_{n,t}^{TopSUE} + \phi_2 \mathbb{1}_{n,t}^{HighSustOwn} + \phi_3 \left(\mathbb{1}_{n,t}^{TopSUE} \times \mathbb{1}_{n,t}^{HighSustOwn} \right) + \Gamma X_{n,t} + \varepsilon_{n,t}.$$

ϕ_3 captures the marginal effect of high sustainable ownership on the difference in returns between Top SUE and Bottom SUE stocks. The outcome variables are the post-announcement cumulative returns up to day H , $R_{n,t}^{(0,H)}$. We estimate specifications for each of the 22 trading days after the announcement ($H = 0, 1, \dots, 22$). See the details in Section 3.4. *Sustainable Ownership* is the fraction of total shares outstanding held by sustainable investors. We define an investor as *Sustainable* if their portfolio-level ESG score is at the top 30% of its distribution across all the investors. *High Sustainable Ownership (Low Sustainable Ownership)* stocks represent the top 30% (bottom 30%) in terms of sustainable ownership. The earnings surprise is measured by the standardized unexpected earnings (SUE). *Top SUE (Bottom SUE)* stocks represent the top 10% (bottom 10%) in terms of earnings surprise during the announcement quarter. Each panel presents the results which use ESG scores from a different dataset - MSCI ESG, MSCI KLD and Refinitiv. Brackets are the 95% confidence intervals with standard errors double-clustered by stock and quarter.

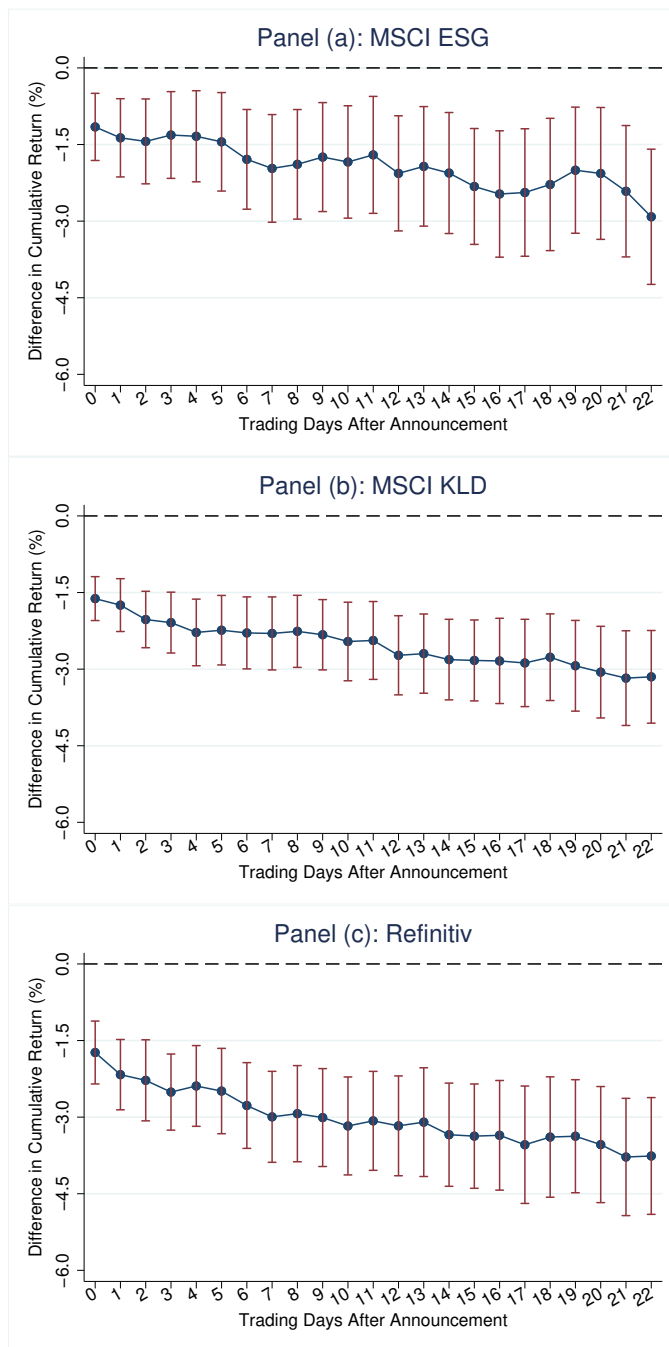


Figure 6: The Correlations between Sustainable Ownership and ESG Score.

This figure plots the relation between the stock-level sustainable ownership and the stock's ESG score. The post-announcement cumulative returns for four groups of stocks. *Sustainable ownership* is defined as the fraction of total shares outstanding held by sustainable investors. We define investors as *Sustainable* if their portfolio-level ESG score is at the top 30% of its distribution across investors. The scores are calculated using three different datasets - MSCI ESG, MSCI KLD and Refinitiv. The results for MSCI ESG and Refinitiv are presented for September 2020, and the results from MSCI KLD are presented for September 2019 (the last year available) to allow for the closest comparison.

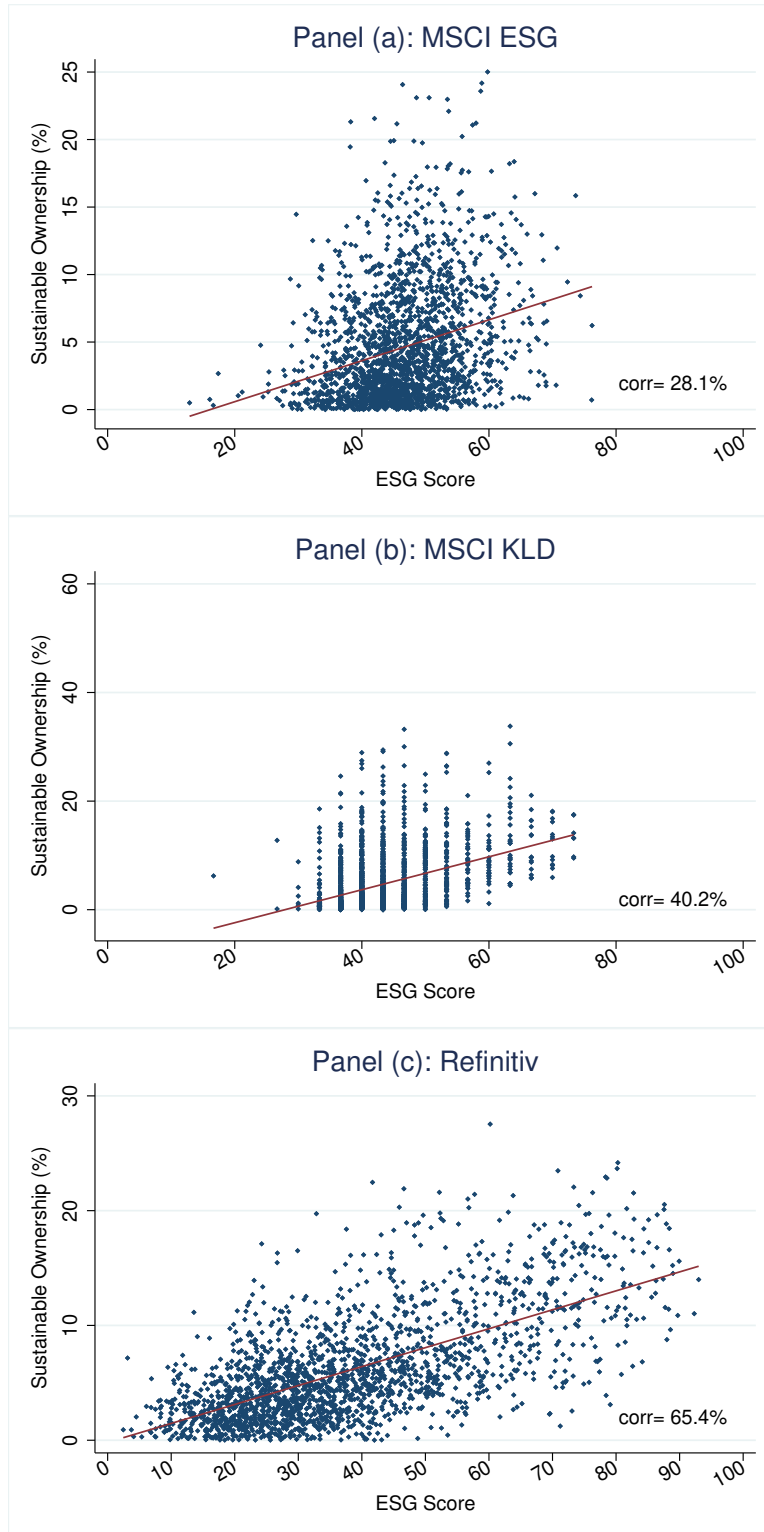


Figure 7: The Effect of ESG Score On Immediate Price Response to Earnings.

This figure displays the announcement-day abnormal returns for stocks with different ESG scores. *High ESG Score* (*Low ESG Score*) stocks exhibit the ESG score at the top 30% (bottom 30%) of its distribution within the announcement quarter. The abnormal return is adjusted using the market model. The stocks are grouped into 11 quantiles by the level of earning surprise, measured by the standardized unexpected earnings (SUE). Quantiles 1-5 contain earnings announcements for negative SUE and quantiles 7-11 contain earnings surprises for positive SUE. Quantile 6 contains announcements with zero SUE. Each panel presents the results which use ESG scores from a different dataset - MSCI ESG, MSCI KLD and Refinitiv. Brackets are the 95% confidence intervals with standard errors double-clustered by stock and quarter.

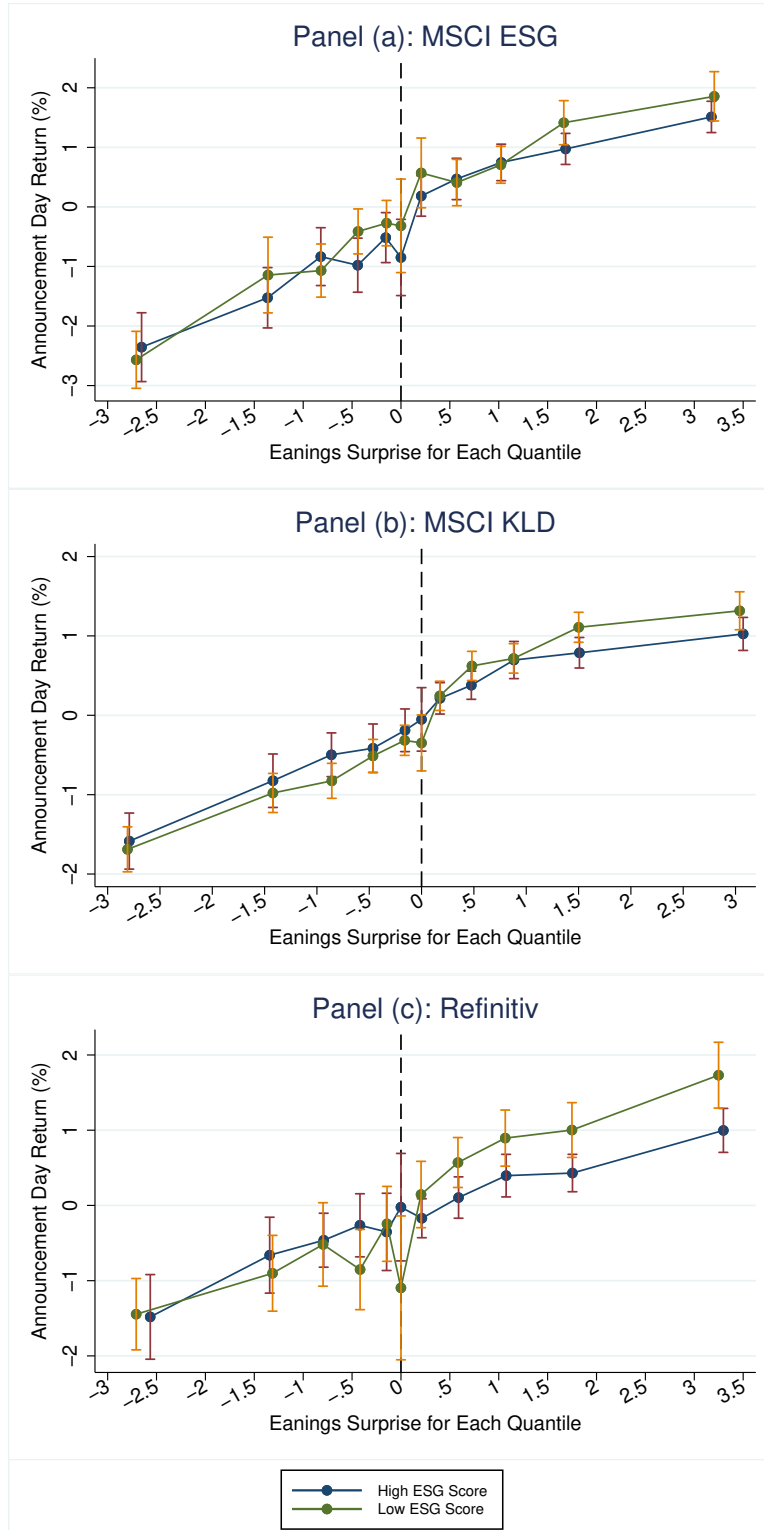


Table 1: The Effect of Sustainable Ownership on the Immediate Price Response to Earnings.

The table shows the results from regressing the announcement-day abnormal returns on the measures of sustainable ownership and earning surprise. *Announcement Day Return* is the abnormal return on the day of the announcement, adjusted using the market model. *Sustainable Ownership* is the fraction of total shares outstanding held by sustainable investors. We define an investor as *Sustainable* if their portfolio-level ESG score is at the top 30% of its distribution across all the investors. *High Sustainable Ownership* (*Low Sustainable Ownership*) stocks represent the top 30% (bottom 30%) in terms of sustainable ownership. The earnings surprise is measured by the standardized unexpected earnings (SUE). *Top SUE* (*Bottom SUE*) stocks represent the top 10% (bottom 10%) in terms of earnings surprise during the announcement quarter in columns (1), (2), (3) and (5) (Quantiles 11 and 1). In columns (4) and (6), *Top SUE* (*Bottom SUE*) stocks represent the top 20% (bottom 20%) in terms of earnings surprise (Quantiles 11,10 and 1,2). Quantile 6 contains all the announcements with zero SUE. Each panel presents the results which use ESG scores from a different dataset - MSCI ESG, MSCI KLD and Refinitiv. The standard errors are clustered by stock and quarter. *, **, and *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

Panel A: MSCI ESG						
y =	<i>Announcement Day Return</i>					
Top SUE vs. Bottom SUE =	Quantile 11 vs. 1		Quantiles 11,10 vs. 1,2		Quantile 11 vs. 1	Quantiles 11,10 vs. 1,2
	(1)	(2)	(3)	(4)	(5)	(6)
<i>High Sustainable Ownership</i>	0.005*** (0.002)	-0.002 (0.003)	-0.005 (0.004)	-0.001 (0.003)		
<i>Sustainable Ownership</i>					-0.042** (0.021)	-0.014 (0.018)
<i>Top SUE</i>	0.046*** (0.002)	0.044*** (0.003)	0.027*** (0.004)	0.022*** (0.002)	0.025*** (0.003)	0.022*** (0.002)
<i>High Sustainable Ownership * Top SUE</i>	-0.012*** (0.003)	-0.012*** (0.003)	-0.012*** (0.003)	-0.010*** (0.003)		
<i>Sustainable Ownership * Top SUE</i>					-0.038 (0.023)	-0.049*** (0.018)
Observations	18611	17250	15184	31628	27129	55315
R-squared	0.070	0.125	0.124	0.085	0.102	0.071

Panel B: MSCI KLD						
y =	<i>Announcement Day Return</i>					
Top SUE vs. Bottom SUE =	Quantile 11 vs. 1		Quantiles 11,10 vs. 1,2		Quantile 11 vs. 1	Quantiles 11,10 vs. 1,2
	(1)	(2)	(3)	(4)	(5)	(6)
<i>High Sustainable Ownership</i>	0.011*** (0.001)	0.008*** (0.002)	0.008*** (0.002)	0.006*** (0.001)		
<i>Sustainable Ownership</i>					0.026** (0.012)	0.021** (0.008)
<i>Top SUE</i>	0.037*** (0.002)	0.037*** (0.002)	0.030*** (0.003)	0.022*** (0.002)	0.023*** (0.002)	0.017*** (0.001)
<i>High Sustainable Ownership * Top SUE</i>	-0.016*** (0.001)	-0.016*** (0.002)	-0.016*** (0.002)	-0.013*** (0.001)		
<i>ESG Ownership * Top SUE</i>					-0.115*** (0.013)	-0.085*** (0.010)
Observations	37550	35361	29177	59937	51411	104396
R-squared	0.052	0.089	0.087	0.059	0.076	0.054

Panel C: Refinitiv						
y =	<i>Announcement Day Return</i>					
Top SUE vs. Bottom SUE =	Quantile 11 vs. 1		Quantiles 11,10 vs. 1,2		Quantile 11 vs. 1	Quantiles 11,10 vs. 1,2
	(1)	(2)	(3)	(4)	(5)	(6)
<i>High Sustainable Ownership</i>	0.010*** (0.002)	0.007* (0.003)	0.005 (0.004)	0.002 (0.002)		
<i>Sustainable Ownership Ownership</i>					0.038*** (0.012)	0.025** (0.010)
<i>Top SUE</i>	0.045*** (0.002)	0.043*** (0.002)	0.029*** (0.004)	0.024*** (0.002)	0.032*** (0.003)	0.025*** (0.001)
<i>High Sustainable Ownership * Top SUE</i>	-0.017*** (0.002)	-0.017*** (0.003)	-0.017*** (0.003)	-0.014*** (0.002)		
<i>Sustainable Ownership * Top SUE</i>					-0.135*** (0.015)	-0.110*** (0.011)
Observations	24667	23190	19640	40512	34971	71104
R-squared	0.066	0.115	0.120	0.082	0.097	0.069

Controls	No	No	Yes	Yes	Yes	Yes
Day of week FE	No	No	Yes	Yes	Yes	Yes
Calendar month FE	No	No	Yes	Yes	Yes	Yes
Stock FE	No	Yes	Yes	Yes	Yes	Yes
Quarter FE	No	Yes	Yes	Yes	Yes	Yes

Table 2: The Effect of Sustainable Ownership on the Delayed Price Response to Earnings.

The table shows the results from regressing the cumulative post-announcement abnormal returns on the measures of sustainable ownership and earning surprise. *Cumulative Post Announcement Return* is the cumulative abnormal return over the 22 days starting on the first day after the day of the announcement, adjusted using the market model. *Sustainable Ownership* is the fraction of total shares outstanding held by sustainable investors. We define an investor as *Sustainable* if their portfolio-level ESG score is at the top 30% of its distribution across all the investors. *High Sustainable Ownership* (*Low Sustainable Ownership*) stocks represent the top 30% (bottom 30%) in terms of sustainable ownership. The earnings surprise is measured by the standardized unexpected earnings (SUE). *Top SUE* (*Bottom SUE*) stocks represent the top 10% (bottom 10%) in terms of earnings surprise during the announcement quarter in columns (1), (2), (3) and (5) (Quantiles 11 and 1). In columns (4) and (6), *Top SUE* (*Bottom SUE*) stocks represent the top 20% (bottom 20%) in terms of earnings surprise (Quantiles 11,10 and 1,2). Quantile 6 contains all the announcements with zero SUE. Each panel presents the results which use ESG scores from a different dataset - MSCI ESG, MSCI KLD and Refinitiv. The standard errors are clustered by stock and quarter. *, **, and *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

Panel A: MSCI ESG						
y =	<i>Cumulative Post-Annoucement Return</i>					
Top SUE vs. Bottom SUE =	Quantile 11 vs. 1		Quantiles 11,10 vs. 1,2		Quantile 11 vs. 1	Quantiles 11,10 vs. 1,2
	(1)	(2)	(3)	(4)	(5)	(6)
<i>High Sustainable Ownership</i>	0.014** (0.005)	-0.003 (0.006)	0.002 (0.006)	-0.001 (0.003)		
<i>Sustainable Ownership</i>					-0.012 (0.034)	0.002 (0.027)
<i>Top SUE</i>	0.027*** (0.005)	0.015*** (0.004)	0.010 (0.010)	0.007 (0.005)	0.005 (0.007)	0.005 (0.004)
<i>High Sustainable Ownership * Top SUE</i>	-0.015*** (0.005)	-0.007 (0.005)	-0.012** (0.005)	-0.009*** (0.003)		
<i>Sustainable Ownership * Top SUE</i>					-0.029 (0.036)	-0.039 (0.029)
Observations	18567	17196	15151	31600	27139	55358
R-squared	0.008	0.286	0.291	0.199	0.225	0.151

Panel B: MSCI KLD						
y =	<i>Cumulative Post-Annoucement Return</i>					
Top SUE vs. Bottom SUE =	Quantile 11 vs. 1		Quantiles 11,10 vs. 1,2		Quantile 11 vs. 1	Quantiles 11,10 vs. 1,2
	(1)	(2)	(3)	(4)	(5)	(6)
<i>High Sustainable Ownership</i>	0.012*** (0.003)	0.008* (0.004)	0.009** (0.004)	0.006** (0.003)		
<i>Sustainable Ownership</i>					0.009 (0.023)	0.019 (0.017)
<i>Top SUE</i>	0.023*** (0.003)	0.021*** (0.003)	0.013** (0.006)	0.009*** (0.003)	0.006 (0.005)	0.006** (0.003)
<i>High Sustainable Ownership * Top SUE</i>	-0.015*** (0.003)	-0.013*** (0.004)	-0.012*** (0.004)	-0.007*** (0.003)		
<i>Sustainable Ownership * Top SUE</i>					-0.053** (0.022)	-0.041** (0.017)
Observations	37464	35248	29119	59897	51453	104522
R-squared	0.005	0.248	0.245	0.177	0.196	0.136

Panel C: Refinitiv						
y =	<i>Cumulative Post-Annoucement Return</i>					
Top SUE vs. Bottom SUE =	Quantile 11 vs. 1		Quantiles 11,10 vs. 1,2		Quantile 11 vs. 1	Quantiles 11,10 vs. 1,2
	(1)	(2)	(3)	(4)	(5)	(6)
<i>High Sustainable Ownership</i>	0.015*** (0.004)	0.001 (0.005)	0.007 (0.006)	0.003 (0.004)		
<i>Sustainable Ownership</i>					-0.005 (0.026)	-0.016 (0.018)
<i>Top SUE</i>	0.029*** (0.004)	0.023*** (0.004)	0.016** (0.007)	0.011*** (0.004)	0.009 (0.007)	0.006* (0.004)
<i>High Sustainable Ownership * Top SUE</i>	-0.020*** (0.004)	-0.016*** (0.005)	-0.017*** (0.005)	-0.013*** (0.004)		
<i>Sustainable Ownership * Top SUE</i>					-0.031 (0.028)	-0.035* (0.020)
Observations	24587	23109	19597	40426	35011	71218
R-squared	0.009	0.262	0.258	0.181	0.199	0.135

Controls	No	No	Yes	Yes	Yes	Yes
Day of week FE	No	No	Yes	Yes	Yes	Yes
Calendar month FE	No	No	Yes	Yes	Yes	Yes
Stock FE	No	Yes	Yes	Yes	Yes	Yes
Quarter FE	No	Yes	Yes	Yes	Yes	Yes

Table 3: The Effect of Sustainable Ownership on the Normalized Delayed Price Response..

The table shows the results from regressing the normalized delayed response to earnings on the measures of sustainable ownership and earning surprise. *Normalized Delayed Response* is the ratio of the cumulative abnormal return over the 22 days (starting on the first day after the day of the announcement) to the total cumulative return over the 22 days after the announcement. See the details in Section 2.3.2. *Sustainable Ownership* is the fraction of total shares outstanding held by sustainable investors. We define an investor as *Sustainable* if their portfolio-level ESG score is at the top 30% of its distribution across all the investors. *High Sustainable Ownership* (*Low Sustainable Ownership*) stocks represent the top 30% (bottom 30%) in terms of sustainable ownership. The earnings surprise is measured by the standardized unexpected earnings (SUE). *Top SUE* (*Bottom SUE*) stocks represent the top 10% (bottom 10%) in terms of earnings surprise during the announcement quarter in columns (1), (2), (3) and (5) (Quantiles 11 and 1). In columns (4) and (6), *Top SUE* (*Bottom SUE*) stocks represent the top 20% (bottom 20%) in terms of earnings surprise (Quantiles 11,10 and 1,2). Quantile 6 contains all the announcements with zero SUE. Each panel presents the results which use ESG scores from a different dataset - MSCI ESG, MSCI KLD and Refinitiv. The standard errors are clustered by stock and quarter. *, **, and *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

Panel A: MSCI ESG						
y =	<i>Normalized Delayed Response</i>					
Top SUE vs. Bottom SUE =	Quantile 11 vs. 1		Quantiles 11,10 vs. 1,2		Quantile 11 vs. 1	Quantiles 11,10 vs. 1,2
	(1)	(2)	(3)	(4)	(5)	(6)
<i>High Sustainable Ownership</i>	-0.023 (0.058)	0.140 (0.127)	0.206 (0.140)	0.068 (0.074)		
<i>Sustainable Ownership</i>					1.451 (0.882)	0.938** (0.405)
<i>Top SUE</i>	-0.316*** (0.062)	-0.269*** (0.077)	-0.158 (0.157)	-0.268*** (0.083)	-0.397*** (0.128)	-0.399*** (0.057)
<i>High Sustainable Ownership * Top SUE</i>	-0.067 (0.088)	-0.106 (0.125)	-0.096 (0.133)	-0.100 (0.075)		
<i>Sustainable Ownership * Top SUE</i>					-0.620 (0.954)	-0.145 (0.482)
Observations	18638	17257	15155	31584	27065	55211
R-squared	0.004	0.204	0.200	0.130	0.151	0.091

Panel B: MSCI KLD						
y =	<i>Normalized Delayed Response</i>					
Top SUE vs. Bottom SUE =	Quantile 11 vs. 1		Quantiles 11,10 vs. 1,2		Quantile 11 vs. 1	Quantiles 11,10 vs. 1,2
	(1)	(2)	(3)	(4)	(5)	(6)
<i>High Sustainable Ownership</i>	0.004 (0.035)	0.031 (0.061)	0.126 (0.078)	0.114** (0.047)		
<i>Sustainable Ownership</i>					1.019* (0.520)	0.851** (0.365)
<i>Top SUE</i>	-0.282*** (0.036)	-0.250*** (0.049)	-0.215** (0.098)	-0.245*** (0.052)	-0.308*** (0.067)	-0.304*** (0.034)
<i>High Sustainable Ownership * Top SUE</i>	-0.059 (0.047)	-0.098 (0.065)	-0.154** (0.077)	-0.127** (0.050)		
<i>Sustainable Ownership * Top SUE</i>					-0.606 (0.518)	-0.703* (0.373)
Observations	37545	35336	29050	59805	51272	104190
R-squared	0.004	0.161	0.157	0.109	0.124	0.076

Panel C: Refinitiv						
y =	<i>Normalized Delayed Response</i>					
Top SUE vs. Bottom SUE =	Quantile 11 vs. 1		Quantiles 11,10 vs. 1,2		Quantile 11 vs. 1	Quantiles 11,10 vs. 1,2
	(1)	(2)	(3)	(4)	(5)	(6)
<i>High Sustainable Ownership</i>	0.074 (0.058)	0.090 (0.129)	0.227 (0.155)	0.015 (0.091)		
<i>Sustainable Ownership</i>					1.190* (0.627)	1.059** (0.424)
<i>Top SUE</i>	-0.301*** (0.053)	-0.295*** (0.072)	-0.225* (0.124)	-0.313*** (0.064)	-0.339*** (0.093)	-0.342*** (0.047)
<i>High Sustainable Ownership * Top SUE</i>	-0.201*** (0.072)	-0.185* (0.097)	-0.270** (0.121)	-0.167** (0.069)		
<i>Sustainable Ownership * Top SUE</i>					-1.272** (0.557)	-0.874** (0.390)
Observations	24658	23187	19545	40346	34870	70942
R-squared	0.006	0.172	0.168	0.118	0.133	0.084

Controls	No	No	Yes	Yes	Yes	Yes
Day of week FE	No	No	Yes	Yes	Yes	Yes
Calendar month FE	No	No	Yes	Yes	Yes	Yes
Stock FE	No	Yes	Yes	Yes	Yes	Yes
Quarter FE	No	Yes	Yes	Yes	Yes	Yes

Table 4: The Effect of Sustainable Ownership on the Trading Volume.

The table shows the results from regressing the announcement-day changes in trading volume on the measures of sustainable ownership and earning surprise. *Announcement Day Volume* is the percentage increase in trading volume around announcement date, relative to the 10-day window from day 20 to day 11 prior to the announcement. See the details in Section 2.3.2. *Sustainable Ownership* is the fraction of total shares outstanding held by sustainable investors. We define an investor as *Sustainable* if their portfolio-level ESG score is at the top 30% of its distribution across all the investors. *High Sustainable Ownership* (*Low Sustainable Ownership*) stocks represent the top 30% (bottom 30%) in terms of sustainable ownership. The earnings surprise is measured by the standardized unexpected earnings (SUE). *Top SUE* (*Bottom SUE*) stocks represent the top 10% (bottom 10%) in terms of earnings surprise during the announcement quarter in columns (1), (2), (3) and (5) (Quantiles 11 and 1). In columns (4) and (6), *Top SUE* (*Bottom SUE*) stocks represent the top 20% (bottom 20%) in terms of earnings surprise (Quantiles 11,10 and 1,2). Quantile 6 contains all the announcements with zero SUE. Each panel presents the results which use ESG scores from a different dataset - MSCI ESG, MSCI KLD and Refinitiv. The standard errors are clustered by stock and quarter. *, **, and *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

Panel A: MSCI ESG						
y =	<i>Announcement Day Volume</i>					
Top SUE vs. Bottom SUE =	Quantile 11 vs. 1		Quantiles 11,10 vs. 1,2		Quantile 11 vs. 1	Quantiles 11,10 vs. 1,2
	(1)	(2)	(3)	(4)	(5)	(6)
<i>High Sustainable Ownership</i>	0.159*** (0.025)	0.004 (0.034)	0.021 (0.033)	0.015 (0.022)		
<i>Sustainable Ownership</i>					0.101 (0.222)	0.114 (0.151)
<i>Top SUE</i>	0.121*** (0.040)	0.102*** (0.030)	0.089** (0.039)	0.103*** (0.024)	0.045 (0.031)	0.049*** (0.017)
<i>High Sustainable Ownership * Top SUE</i>	-0.088** (0.035)	-0.081** (0.032)	-0.068** (0.029)	-0.083*** (0.019)		
<i>Sustainable Ownership * Top SUE</i>					-0.201 (0.185)	-0.231 (0.141)
Observations	18849	17498	15435	32193	27562	56278
R-squared	0.007	0.434	0.454	0.380	0.410	0.355
Panel B: MSCI KLD						
y =	<i>Announcement Day Volume</i>					
Top SUE vs. Bottom SUE =	Quantile 11 vs. 1		Quantiles 11,10 vs. 1,2		Quantile 11 vs. 1	Quantiles 11,10 vs. 1,2
	(1)	(2)	(3)	(4)	(5)	(6)
<i>High Sustainable Ownership</i>	0.072*** (0.019)	0.111*** (0.026)	0.096*** (0.026)	0.089*** (0.017)		
<i>Sustainable Ownership</i>					0.418** (0.165)	0.398*** (0.115)
<i>Top SUE</i>	0.158*** (0.022)	0.164*** (0.023)	0.105*** (0.031)	0.113*** (0.020)	0.075*** (0.024)	0.073*** (0.014)
<i>High Sustainable Ownership * Top SUE</i>	-0.065** (0.026)	-0.090*** (0.026)	-0.081*** (0.025)	-0.095*** (0.018)		
<i>Sustainable Ownership * Top SUE</i>					-0.572*** (0.164)	-0.573*** (0.125)
Observations	37943	35766	29580	60876	52172	106037
R-squared	0.005	0.352	0.372	0.315	0.342	0.293
Panel C: Refinitiv						
y =	<i>Announcement Day Volume</i>					
Top SUE vs. Bottom SUE =	Quantile 11 vs. 1		Quantiles 11,10 vs. 1,2		Quantile 11 vs. 1	Quantiles 11,10 vs. 1,2
	(1)	(2)	(3)	(4)	(5)	(6)
<i>High Sustainable Ownership</i>	0.088*** (0.024)	0.013 (0.043)	0.026 (0.043)	0.044 (0.028)		
<i>Sustainable Ownership</i>					0.235 (0.186)	0.129 (0.135)
<i>Top SUE</i>	0.167*** (0.031)	0.172*** (0.031)	0.134*** (0.040)	0.102*** (0.027)	0.093*** (0.030)	0.080*** (0.019)
<i>High Sustainable Ownership * Top SUE</i>	-0.151*** (0.027)	-0.164*** (0.032)	-0.112*** (0.033)	-0.099*** (0.022)		
<i>Sustainable Ownership * Top SUE</i>					-0.635*** (0.169)	-0.608*** (0.126)
Observations	24929	23480	19916	41124	35506	72287
R-squared	0.004	0.403	0.420	0.352	0.387	0.333
Controls	No	No	Yes	Yes	Yes	Yes
Day of week FE	No	No	Yes	Yes	Yes	Yes
Calendar month FE	No	No	Yes	Yes	Yes	Yes
Stock FE	No	Yes	Yes	Yes	Yes	Yes
Quarter FE	No	Yes	Yes	Yes	Yes	Yes

Table 5: Robustness Tests for the Time-Varying Definition of Sustainable Investor.

The table shows the results from robustness tests where we allow for time variation in investor preferences for sustainability. We only report the main coefficient on the interaction between the measure of sustainable ownership and the measure of earnings surprise, using the same specifications and outcome variables as in columns (3) of Tables 2 - 4. *Sustainable Ownership* is the fraction of total shares outstanding held by sustainable investors. We define an investor as *Sustainable* if their portfolio-level ESG score is at the top 30% of its distribution across all the investors in the given quarter. The scores are calculated using three different datasets - MSCI ESG, MSCI KLD and Refinitiv. *High Sustainable Ownership* (*Low Sustainable Ownership*) stocks represent the top 30% (bottom 30%) in terms of sustainable ownership. The earnings surprise is measured by the standardized unexpected earnings (SUE). *Top SUE* (*Bottom SUE*) stocks represent the top 10% (bottom 10%) in terms of earnings surprise during the announcement quarter. The standard errors are clustered by stock and quarter. *, **, and *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

y=	<i>Announcement Day Return</i>	<i>Cumulative Post-Announcement Return</i>	<i>Normalized Delayed Reponse</i>	<i>Announcement Day Volume</i>
	Coefficient on <i>High Sustainable Ownership</i> * <i>Top SUE</i>			
Dataset	(1)	(2)	(3)	(4)
MSCI ESG	-0.011*** (0.003)	-0.006 (0.005)	-0.056 (0.120)	-0.101*** (0.031)
MSCI KLD	-0.016*** (0.002)	-0.010*** (0.003)	-0.037 (0.083)	-0.082*** (0.025)
Refinitiv	-0.016*** (0.003)	-0.005 (0.004)	-0.062 (0.112)	-0.053* (0.031)

Table 6: Robustness to the Effect of Investor Horizon.

The table shows the results from regressing the announcement-day abnormal returns on the measures of sustainable ownership, earning surprise and churn ratio which capture the investor horizon for the stock's investor. *Announcement Day Return* is the abnormal return on the day of the announcement, adjusted using the market model. *Sustainable Ownership* is the fraction of total shares outstanding held by sustainable investors. We define an investor as *Sustainable* if their portfolio-level ESG score is at the top 30% of its distribution across all the investors. *High Sustainable Ownership (Low Sustainable Ownership)* stocks represent the top 30% (bottom 30%) in terms of sustainable ownership. The earnings surprise is measured by the standardized unexpected earnings (SUE). *Top SUE (Bottom SUE)* stocks represent the top 10% (bottom 10%) in terms of sustainable ownership. The earnings surprise during the announcement quarter in columns (1), (2), (4), (5), (7) and (8) (Quantiles 1,1 and 1,2). In columns (3), (6) and (9), *Top SUE (Bottom SUE)* stocks represent the top 20% (bottom 20%) in terms of earnings surprise (Quantiles 1,1,10 and 1,2). Quantile 6 contains all the announcements with zero SUE. The *Churn Ratio* is the measure of investment horizon from Gaspar et al. (2005) and Starks et al. (2023). *High Churn Ratio (Low Churn Ratio)* stocks represent the top 30% (bottom 30%) in terms of churn ratio distribution in the given quarter. We present the results using ESG scores from three different datasets - MSCI ESG (columns (1)-(3)), MSCI KLD (columns (4)-(6)) and Refinitiv (columns (7)-(9)). The standard errors are clustered by stock and quarter. *, **, and *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

y =	Announcement Day Return								
	MSCI ESG			MSCI KLD			Refinitiv		
Dataset	Quantile 1,1 vs. 1	Quantile 1,1 vs. 1	Quantile 1,1 vs. 1	Quantile 1,1 vs. 1	Quantile 1,1 vs. 1	Quantile 1,1 vs. 1	Quantile 1,1 vs. 1	Quantile 1,1 vs. 1	Quantiles 1,1,10 vs. 1,2
Top SUE vs. Bottom SUE =	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<i>High Sustainable Ownership</i>	-0.006 (0.005)	-0.041* (0.021)	-0.001 (0.003)	0.008** (0.003)	0.027** (0.012)	0.009*** (0.002)	0.001 (0.005)	0.039*** (0.012)	0.002 (0.003)
<i>Sustainable Ownership</i>									
<i>Top SUE</i>	0.024*** (0.006)	0.020*** (0.005)	0.021*** (0.003)	0.032*** (0.004)	0.027*** (0.004)	0.024*** (0.002)	0.027*** (0.006)	0.030*** (0.005)	0.022*** (0.003)
<i>High Sustainable Ownership * Top SUE</i>	-0.013*** (0.004)		-0.011*** (0.003)	-0.016*** (0.003)		-0.015*** (0.002)	-0.016*** (0.004)		-0.015*** (0.002)
<i>Sustainable Ownership * Top SUE</i>		-0.036 (0.023)			-0.118*** (0.014)			-0.134*** (0.015)	
<i>High Churn Ratio</i>	-0.000 (0.004)		-0.004 (0.003)	0.004* (0.002)		0.001 (0.001)	-0.007* (0.004)		-0.003 (0.002)
<i>Churn Ratio</i>					0.012 (0.017)			0.002 (0.020)	
<i>High Churn Ratio * Top SUE</i>	0.004 (0.005)		0.002 (0.003)	-0.003 (0.003)		-0.002 (0.002)	0.009** (0.004)		0.003 (0.003)
<i>Churn Ratio * Top SUE</i>		0.033 (0.027)			-0.024 (0.021)			0.013 (0.023)	
Observations	8063	27098	17850	15734	51372	33748	10420	34930	22682
R-squared	0.350	0.235	0.253	0.316	0.193	0.224	0.333	0.219	0.235
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Day of week FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Calendar month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Stock FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 7: The Effects of the Stock's ESG Score on the Immediate Price Response to Earnings.

The table shows the results from regressing the announcement-day abnormal returns on the stock's ESG SCORE and the measure of earning surprise. *Announcement Day Return* is the abnormal return on the day of the announcement, adjusted using the market model. *High ESG Score* (*Low ESG Score*) stocks represent the top 30% (bottom 30%) in terms of the ESG score distribution in the given quarter. The earnings surprise is measured by the standardized unexpected earnings (SUE). *Top SUE* (*Bottom SUE*) stocks represent the top 10% (bottom 10%) in terms of earnings surprise during the announcement quarter (Quantiles 11 and 1). Quantile 6 contains all the announcements with zero SUE. We present the results using ESG scores from three different datasets - MSCI ESG, MSCI KLD and Refinitiv. The standard errors are clustered by stock and quarter. *, **, and *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

y = Dataset	<i>Announcement Day Return</i>								
	MSCI ESG			MSCI KLD			Refinitiv		
	(1)	(2)	(3)	(4)	(5)	(6)	(4)	(5)	(6)
<i>High ESG Score</i>	0.001 (0.004)	0.001 (0.005)	0.001 (0.005)	0.001 (0.002)	0.002 (0.003)	0.001 (0.003)	-0.003 (0.004)	0.004 (0.006)	0.000 (0.005)
<i>Top SUE</i>	0.043*** (0.003)	0.043*** (0.004)	0.022*** (0.006)	0.038*** (0.002)	0.035*** (0.002)	0.018*** (0.003)	0.035*** (0.003)	0.036*** (0.004)	0.014** (0.006)
<i>High ESG Score * Top SUE</i>	-0.002 (0.005)	-0.003 (0.005)	-0.001 (0.006)	-0.005* (0.003)	-0.003 (0.003)	-0.004 (0.003)	-0.004 (0.005)	-0.007 (0.005)	-0.007 (0.005)
Observations	10456	9914	9043	23570	22771	21563	7213	6851	6202
R-squared	0.061	0.269	0.281	0.052	0.239	0.250	0.045	0.289	0.293
Controls	No	No	Yes	No	No	Yes	No	No	Yes
Day of week FE	No	No	Yes	No	No	Yes	No	No	Yes
Calendar month FE	No	No	Yes	No	No	Yes	No	No	Yes
Stock FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Quarter FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes

Table 8: Placebo Test: The Effects of Sustainable Ownership in 1980s and 1990s.

The table shows the results from regressing the announcement-day abnormal returns on the measures of sustainable ownership and earning surprise during the sample period when the ESG score were not available. *Announcement Day Return* is the abnormal return on the day of the announcement, adjusted using the market model. *Sustainable Ownership* is the fraction of total shares outstanding held by sustainable investors. We define an investor as *Sustainable* if their portfolio-level ESG score is at the top 30% of its distribution across all the investors. *High Sustainable Ownership* (*Low Sustainable Ownership*) stocks represent the top 30% (bottom 30%) in terms of sustainable ownership. The earnings surprise is measured by the standardized unexpected earnings (SUE). *Top SUE* (*Bottom SUE*) stocks represent the top 10% (bottom 10%) in terms of earnings surprise during the announcement quarter (Quantiles 11 and 1). Quantile 6 contains all the announcements with zero SUE. We present the results using ESG scores from a different dataset - MSCI ESG, MSCI KLD and Refinitiv. The standard errors are clustered by stock and quarter. *, **, and *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

Dataset	MSCI ESG		MSCI KLD		Refinitiv	
Sample Period	1984q3-1992q2					
y=	<i>Announcement Day Return</i>					
	(1)	(2)	(3)	(4)	(5)	(6)
<i>High Sustainable Ownership</i>	-0.002 (0.004)		-0.002 (0.003)		-0.014** (0.006)	
<i>Sustainable Ownership</i>		-0.014 (0.022)		-0.011 (0.018)		-0.019 (0.018)
<i>Top SUE</i>	0.011*** (0.004)	0.009*** (0.002)	0.011*** (0.003)	0.009*** (0.002)	0.011*** (0.003)	0.011*** (0.002)
<i>High Sustainable Ownership * Top SUE</i>	-0.004 (0.003)		-0.001 (0.003)		-0.004 (0.003)	
<i>Sustainable Ownership * Top SUE</i>		-0.009 (0.017)		0.001 (0.012)		-0.022 (0.015)
Observations	3357	6204	3245	6066	3474	6431
R-squared	0.339	0.292	0.344	0.294	0.344	0.294
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Day of week FE	Yes	Yes	Yes	Yes	Yes	Yes
Calendar month FE	Yes	Yes	Yes	Yes	Yes	Yes
Stock FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes

Online Appendix

A Additional Results

Figure A.1: The Effect of Sustainable Ownership On Immediate Price Response to Earnings: Time-Varying Ownership Definition.

This figure displays the announcement-day abnormal returns for stocks with different levels of ownership by sustainable investors. *Sustainable Ownership* is the fraction of total shares outstanding held by sustainable investors. We define an investor as *Sustainable* if their portfolio-level ESG score is at the top 30% of its distribution across all the investors. *High Sustainable Ownership* (*Low Sustainable Ownership*) stocks represent the top 30% (bottom 30%) in terms of sustainable ownership. The abnormal return is adjusted using the market model. The stocks are grouped into 11 quantiles by the level of earning surprise, measured by the standardized unexpected earnings (SUE). Quantiles 1-5 contain earnings announcements for negative SUE and quantiles 7-11 contain earnings surprises for positive SUE. Quantile 6 contains announcements with zero SUE. Each panel presents the results which use ESG scores from a different dataset - MSCI ESG, MSCI KLD and Refinitiv. Brackets are the 95% confidence intervals with standard errors double-clustered by stock and quarter.

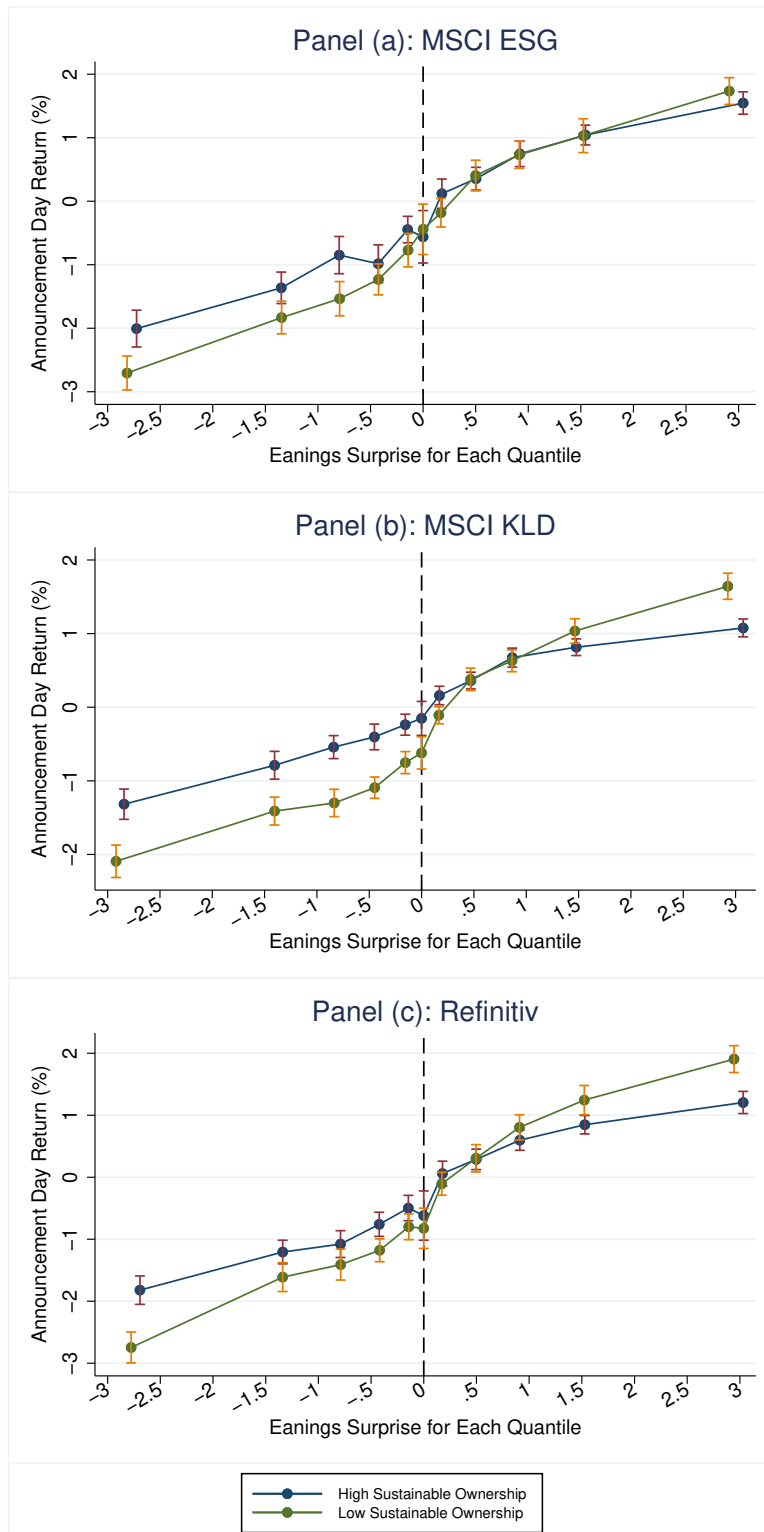


Figure A.2: The Effect of Sustainable Ownership on the Post-Announcement Cumulative Returns: Time-Varying Definition of Ownership.

This figure presents the post-announcement cumulative returns for four groups of stocks. *Sustainable Ownership* is the fraction of total shares outstanding held by sustainable investors. We define an investor as *Sustainable* if their portfolio-level ESG score is at the top 30% of its distribution across all the investors. *High Sustainable Ownership* (*Low Sustainable Ownership*) stocks represent the top 30% (bottom 30%) in terms of sustainable ownership. The earnings surprise is measured by the standardized unexpected earnings (SUE). *Top SUE* (*Bottom SUE*) stocks represent the top 10% (bottom 10%) in terms of earnings surprise during the announcement quarter. The cumulative abnormal return is the buy-and-hold return adjusted using the market model. Brackets are the 95% confidence intervals with standard errors double-clustered by stock and quarter.

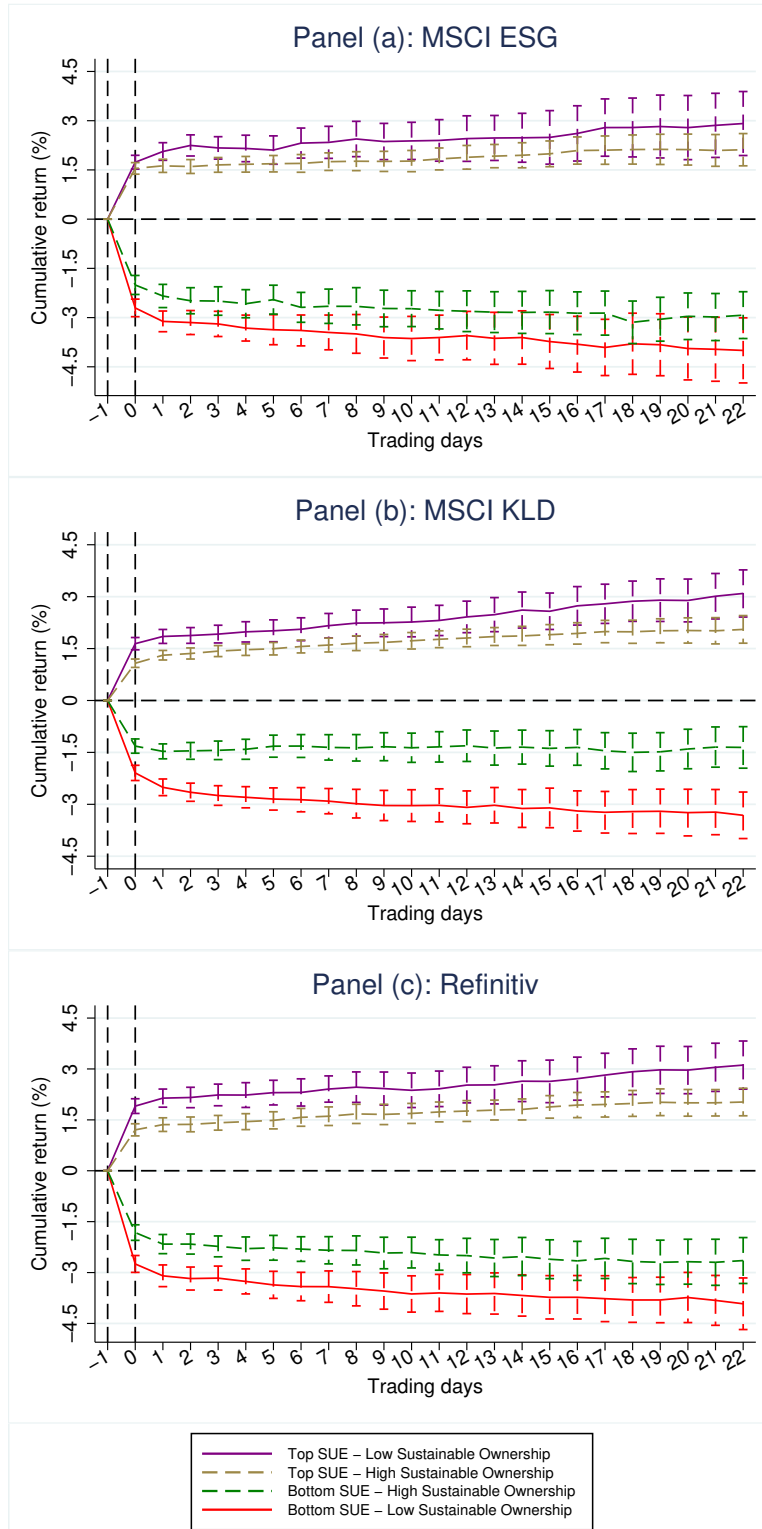


Table A.1: Summary Statistics: MSCI ESG Sample.

This table presents the summary statistics of the dataset where we classify investors as sustainable using the ESG score from the MSCI ESG data. *Announcement Day Return* is the abnormal return on the day of the announcement, adjusted using the market model. *Cumulative Post Announcement Return* is the cumulative abnormal return over the 22 days starting on the first day after the day of the announcement, adjusted using the market model. *Normalized Delayed Response* is the ratio of the cumulative abnormal return over the 22 days (starting on the first day after the day of the announcement) to the total cumulative return over the 22 days after the announcement. *Announcement Day Volume* is the percentage increase in trading volume around announcement date, relative to the 10-day window from day 20 to day 11 prior to the announcement. *Sustainable Ownership* is the fraction of total shares outstanding held by sustainable investors. We define an investor as *Sustainable* if their portfolio-level ESG score is at the top 30% of its distribution across all the investors. The strength of earnings surprise is measured by *SUE* - the standardized unexpected earnings from [Novy-Marx \(2015\)](#). *Macro Announcement* indicator equals one when the announcement day features macroeconomic news announcements. *Top Market* indicator equals one when the market return is in the top 10% of its daily return distribution across the sample period. *Log(Market Cap)* is the natural logarithm of the stock's market capitalization. *B/M* is the stock's book-to-market ratio. *Log(# of Announcements)* is the natural logarithm of the number of earnings announcement on the same announcement day. *Log(# of Analysts)* is the natural logarithm of the number of analysts covering the stock. *Churn Ratio* is the measure of the investment horizon of the stock's investors from [Gaspar et al. \(2005\)](#). Panel A presents the results from the sample of the top 10% (bottom 10%) announcement events in terms of earnings surprise during the announcement quarter (Quantiles 11 and 1). Panel B presents the results from the sample of the top 20% (bottom 20%) announcement events in terms of earnings surprise (Quantiles 11,10 and 1,2). Quantile 6 contains all the announcements with zero SUE.

	N	mean	sd	p10	p25	p50	p75	p90
Panel A: Quantiles 11, 1								
<i>Announcement Day Return</i>	31168	0.001	0.08	-0.086	-0.036	0.001	0.040	0.088
<i>Return from Day 1 to Day 22</i>	31168	-0.000	0.12	-0.128	-0.057	-0.001	0.052	0.120
<i>NDR</i>	31167	0.744	2.93	-0.734	0.229	0.781	1.270	2.266
<i>Announcement Day Volume</i>	31601	0.971	0.83	0.043	0.473	0.939	1.442	1.955
<i>Sustainable Ownership</i>	31741	0.051	0.05	0.003	0.012	0.036	0.075	0.116
<i>SUE</i>	31741	0.496	3.29	-3.431	-2.262	2.062	2.923	3.871
<i>Macro Announcement</i>	31741	0.232	0.42	0.000	0.000	0.000	0.000	1.000
<i>Top Market</i>	31741	0.132	0.34	0.000	0.000	0.000	0.000	1.000
<i>log (Market Cap)</i>	31741	0.303	1.97	-2.222	-1.094	0.282	1.611	2.865
<i>B/M</i>	30527	0.635	0.74	0.127	0.247	0.469	0.793	1.206
<i>Log(# of Announcements)</i>	31741	4.989	0.94	3.584	4.533	5.182	5.717	5.935
<i>Log(# of Analysts)</i>	29606	1.724	0.86	0.693	1.099	1.792	2.398	2.773
<i>ChurnRatio</i>	31682	0.164	0.05	0.112	0.131	0.157	0.189	0.222
Panel B: Quantiles 11, 10 and 1,2								
<i>Announcement Day Return</i>	62258	0.001	0.07	-0.083	-0.035	0.001	0.038	0.086
<i>Return from Day 1 to Day 22</i>	62258	0.000	0.11	-0.124	-0.057	-0.001	0.052	0.121
<i>NDR</i>	62257	0.773	2.55	-0.696	0.250	0.795	1.272	2.253
<i>Announcement Day Volume</i>	63236	0.956	0.83	0.030	0.455	0.922	1.426	1.943
<i>Sustainable Ownership</i>	63482	0.050	0.05	0.003	0.012	0.035	0.075	0.115
<i>SUE</i>	63482	0.404	2.56	-2.608	-1.591	1.316	2.166	3.154
<i>Macro Announcement</i>	63482	0.232	0.42	0.000	0.000	0.000	0.000	1.000
<i>Top Market</i>	63481	0.131	0.34	0.000	0.000	0.000	0.000	1.000
<i>log (Market Cap)</i>	63482	0.232	1.95	-2.243	-1.137	0.192	1.504	2.773
<i>B/M</i>	61100	0.646	0.77	0.135	0.261	0.485	0.804	1.207
<i>Log(# of Announcements)</i>	63482	4.998	0.94	3.611	4.554	5.187	5.720	5.935
<i>Log(# of Analysts)</i>	59112	1.689	0.86	0.693	1.099	1.792	2.303	2.773
<i>ChurnRatio</i>	63365	0.164	0.05	0.112	0.131	0.157	0.189	0.223

Table A.2: Summary Statistics: MSCI KLD Sample.

This table presents the summary statistics of the dataset where we classify investors as sustainable using the ESG score from the MSCI KLD data. *Announcement Day Return* is the abnormal return on the day of the announcement, adjusted using the market model. *Cumulative Post Announcement Return* is the cumulative abnormal return over the 22 days starting on the first day after the day of the announcement, adjusted using the market model. *Normalized Delayed Response* is the ratio of the cumulative abnormal return over the 22 days (starting on the first day after the day of the announcement) to the total cumulative return over the 22 days after the announcement. *Announcement Day Volume* is the percentage increase in trading volume around announcement date, relative to the 10-day window from day 20 to day 11 prior to the announcement. *Sustainable Ownership* is the fraction of total shares outstanding held by sustainable investors. We define an investor as *Sustainable* if their portfolio-level ESG score is at the top 30% of its distribution across all the investors. The strength of earnings surprise is measured by *SUE* - the standardized unexpected earnings from [Novy-Marx \(2015\)](#). *Macro Announcement* indicator equals one when the announcement day features macroeconomic news announcements. *Top Market* indicator equals one when the market return is in the top 10% of its daily return distribution across the sample period. *Log(Market Cap)* is the natural logarithm of the stock's market capitalization. *B/M* is the stock's book-to-market ratio. *Log(# of Announcements)* is the natural logarithm of the number of earnings announcement on the same announcement day. *Log(# of Analysts)* is the natural logarithm of the number of analysts covering the stock. *Churn Ratio* is the measure of the investment horizon of the stock's investors from [Gaspar et al. \(2005\)](#). Panel A presents the results from the sample of the top 10% (bottom 10%) announcement events in terms of earnings surprise during the announcement quarter (Quantiles 11 and 1). Panel B presents the results from the sample of the top 20% (bottom 20%) announcement events in terms of earnings surprise (Quantiles 11,10 and 1,2). Quantile 6 contains all the announcements with zero SUE.

	N	mean	sd	p10	p25	p50	p75	p90
Panel A: Quantiles 11, 1								
<i>Announcement Day Return</i>	62386	0.001	0.07	-0.072	-0.028	0.001	0.031	0.074
<i>Return from Day 1 to Day 22</i>	62386	0.004	0.12	-0.127	-0.056	0.002	0.059	0.134
<i>NDR</i>	62386	0.809	2.45	-0.451	0.378	0.867	1.234	2.063
<i>Announcement Day Volume</i>	63103	0.833	0.96	-0.276	0.267	0.820	1.396	1.977
<i>Sustainable Ownership</i>	63544	0.035	0.05	0.001	0.005	0.016	0.047	0.097
<i>SUE</i>	63544	0.549	3.23	-3.439	-2.339	2.080	2.941	4.013
<i>Macro Announcement</i>	63544	0.151	0.36	0.000	0.000	0.000	0.000	1.000
<i>Top Market</i>	63544	0.120	0.32	0.000	0.000	0.000	0.000	1.000
<i>log (Market Cap)</i>	63544	0.202	1.86	-2.097	-1.098	0.106	1.396	2.643
<i>B/M</i>	61420	0.614	0.72	0.146	0.267	0.467	0.756	1.135
<i>Log(# of Announcements)</i>	63544	5.027	0.89	3.689	4.615	5.209	5.707	5.964
<i>Log(# of Analysts)</i>	55497	1.529	0.88	0.000	0.693	1.609	2.197	2.639
<i>ChurnRatio</i>	63444	0.168	0.05	0.114	0.136	0.164	0.195	0.227
Panel B: Quantiles 11, 10 and 1,2								
<i>Announcement Day Return</i>	124639	0.001	0.06	-0.070	-0.027	0.001	0.030	0.074
<i>Return from Day 1 to Day 22</i>	124639	0.005	0.12	-0.126	-0.057	0.001	0.059	0.134
<i>NDR</i>	124638	0.826	2.17	-0.431	0.389	0.873	1.237	2.055
<i>Announcement Day Volume</i>	126237	0.822	0.95	-0.283	0.257	0.807	1.383	1.961
<i>Sustainable Ownership</i>	127087	0.034	0.05	0.001	0.004	0.016	0.044	0.094
<i>SUE</i>	127087	0.410	2.52	-2.626	-1.639	1.286	2.131	3.200
<i>Macro Announcement</i>	127087	0.151	0.36	0.000	0.000	0.000	0.000	1.000
<i>Top Market</i>	127087	0.120	0.32	0.000	0.000	0.000	0.000	1.000
<i>log (Market Cap)</i>	127087	0.153	1.84	-2.123	-1.131	0.059	1.330	2.577
<i>B/M</i>	122927	0.625	0.74	0.150	0.276	0.480	0.770	1.144
<i>Log(# of Announcements)</i>	127087	5.038	0.89	3.714	4.625	5.215	5.710	5.966
<i>Log(# of Analysts)</i>	110536	1.503	0.88	0.000	0.693	1.609	2.197	2.639
<i>ChurnRatio</i>	126891	0.168	0.05	0.113	0.136	0.164	0.195	0.227

Table A.3: Summary Statistics: Refinitiv Sample.

This table presents the summary statistics of the dataset where we classify investors as sustainable using the ESG score from the Refinitiv data. *Announcement Day Return* is the abnormal return on the day of the announcement, adjusted using the market model. *Cumulative Post Announcement Return* is the cumulative abnormal return over the 22 days starting on the first day after the day of the announcement, adjusted using the market model. *Normalized Delayed Response* is the ratio of the cumulative abnormal return over the 22 days (starting on the first day after the day of the announcement) to the total cumulative return over the 22 days after the announcement. *Announcement Day Volume* is the percentage increase in trading volume around announcement date, relative to the 10-day window from day 20 to day 11 prior to the announcement. *Sustainable Ownership* is the fraction of total shares outstanding held by sustainable investors. We define an investor as *Sustainable* if their portfolio-level ESG score is at the top 30% of its distribution across all the investors. The strength of earnings surprise is measured by *SUE* - the standardized unexpected earnings from [Novy-Marx \(2015\)](#). *Macro Announcement* indicator equals one when the announcement day features macroeconomic news announcements. *Top Market* indicator equals one when the market return is in the top 10% of its daily return distribution across the sample period. $\log(\text{Market Cap})$ is the natural logarithm of the stock's market capitalization. *B/M* is the stock's book-to-market ratio. $\log(\# \text{ of Announcements})$ is the natural logarithm of the number of earnings announcement on the same announcement day. $\log(\# \text{ of Analysts})$ is the natural logarithm of the number of analysts covering the stock. *Churn Ratio* is the measure of the investment horizon of the stock's investors from [Gaspar et al. \(2005\)](#). Panel A presents the results from the sample of the top 10% (bottom 10%) announcement events in terms of earnings surprise during the announcement quarter (Quantiles 11 and 1). Panel B presents the results from the sample of the top 20% (bottom 20%) announcement events in terms of earnings surprise (Quantiles 11,10 and 1,2). Quantile 6 contains all the announcements with zero SUE.

	N	mean	sd	p10	p25	p50	p75	p90
Panel A: Quantiles 11, 1								
<i>Announcement Day Return</i>	41122	0.001	0.07	-0.083	-0.034	0.001	0.037	0.085
<i>Return from Day 1 to Day 22</i>	41122	0.001	0.11	-0.121	-0.054	-0.001	0.052	0.119
<i>NDR</i>	41121	0.763	2.79	-0.685	0.248	0.792	1.262	2.240
<i>Announcement Day Volume</i>	41662	0.976	0.87	0.004	0.456	0.937	1.467	2.014
<i>Sustainable Ownership</i>	41884	0.072	0.06	0.007	0.027	0.057	0.103	0.154
<i>SUE</i>	41884	0.586	3.20	-3.300	-2.209	2.090	2.931	3.901
<i>Macro Announcement</i>	41884	0.216	0.41	0.000	0.000	0.000	0.000	1.000
<i>Top Market</i>	41884	0.117	0.32	0.000	0.000	0.000	0.000	1.000
$\log(\text{Market Cap})$	41884	0.302	1.96	-2.193	-1.093	0.269	1.590	2.869
<i>B/M</i>	40350	0.617	0.70	0.134	0.256	0.465	0.764	1.158
$\log(\# \text{ of Announcements})$	41884	5.009	0.94	3.611	4.575	5.204	5.727	5.951
$\log(\# \text{ of Analysts})$	37843	1.677	0.87	0.000	1.099	1.792	2.303	2.773
<i>ChurnRatio</i>	41797	0.166	0.05	0.113	0.134	0.160	0.191	0.224
Panel B: Quantiles 11, 10 and 1,2								
<i>Announcement Day Return</i>	82140	0.001	0.07	-0.081	-0.033	0.001	0.036	0.083
<i>Return from Day 1 to Day 22</i>	82140	0.001	0.11	-0.120	-0.055	-0.001	0.052	0.120
<i>NDR</i>	82137	0.778	2.48	-0.660	0.269	0.805	1.262	2.221
<i>Announcement Day Volume</i>	83342	0.960	0.87	-0.013	0.435	0.921	1.450	1.996
<i>Sustainable Ownership</i>	83762	0.071	0.06	0.006	0.027	0.056	0.101	0.154
<i>SUE</i>	83762	0.461	2.50	-2.536	-1.542	1.325	2.167	3.173
<i>Macro Announcement</i>	83762	0.217	0.41	0.000	0.000	0.000	0.000	1.000
<i>Top Market</i>	83761	0.117	0.32	0.000	0.000	0.000	0.000	1.000
$\log(\text{Market Cap})$	83762	0.230	1.93	-2.216	-1.134	0.179	1.484	2.769
<i>B/M</i>	80759	0.626	0.73	0.142	0.267	0.478	0.775	1.160
$\log(\# \text{ of Announcements})$	83762	5.019	0.93	3.638	4.595	5.209	5.730	5.964
$\log(\# \text{ of Analysts})$	75553	1.642	0.87	0.000	1.099	1.792	2.303	2.708
<i>ChurnRatio</i>	83596	0.166	0.05	0.113	0.133	0.160	0.191	0.224

Table A.4: The Mean Earning Surprise for Stocks with Different Levels of Sustainable Ownership.

The table presents the mean earnings surprise across stocks with different levels of sustainable ownership (Panel A) and ESG score (Panel B). *Sustainable Ownership* is the fraction of total shares outstanding held by sustainable investors. We define an investor as *Sustainable* if their portfolio-level ESG score is at the top 30% of its distribution across all the investors. *High Sustainable Ownership* (*Low Sustainable Ownership*) stocks represent the top 30% (bottom 30%) in terms of sustainable ownership. The earnings surprise is measured by the standardized unexpected earnings (SUE). *Top SUE* (*Bottom SUE*) stocks represent the top 10% (bottom 10%) in terms of earnings surprise during the announcement quarter (Quantiles 11 and 1). Quantile 6 contains all the announcements with zero SUE. We present the results using ESG scores from a different dataset - MSCI ESG, MSCI KLD and Refinitiv. The unit of observation is the cross-sectional mean of SUE within each quarter.

Panel A: SUE by Sustainable Ownership					
MSCI ESG					
	Obs	Low Sustainable Ownership	High Sustainable Ownership	High - Low	P-value
<i>Top SUE</i>	61	2.903	3.027	-0.124	0.105
<i>Bottom SUE</i>	61	-2.852	-2.716	-0.136	0.474
MSCI KLD					
<i>Top SUE</i>	115	2.953	3.116	-0.163	0.001
<i>Bottom SUE</i>	115	-2.888	-2.813	-0.076	0.469
Refinitiv					
<i>Top SUE</i>	75	2.93	3.027	-0.098	0.142
<i>Bottom SUE</i>	75	-2.835	-2.671	-0.164	0.309
Panel B: SUE by ESG Score					
MSCI ESG					
	Obs	Low ESG Score	High ESG Score	High - Low	P-value
<i>Top SUE</i>	63	3.204	3.175	0.029	0.731
<i>Bottom SUE</i>	63	-2.708	-2.652	-0.054	0.753
MSCI KLD					
<i>Top SUE</i>	115	3.039	3.073	-0.034	0.576
<i>Bottom SUE</i>	115	-2.81	-2.793	-0.017	0.875
Refinitiv					
<i>Top SUE</i>	77	3.249	3.298	-0.049	0.57
<i>Bottom SUE</i>	77	-2.708	-2.564	-0.144	0.367

Table A.5: The Effect of Sustainable Ownership on the Immediate Price Response to Earnings: MSCI ESG.

The table shows the results from regressing the announcement-day abnormal returns on the measures of sustainable ownership and earning surprise, using the MSCI ESG dataset for ESG scores. *Announcement Day Return* is the abnormal return on the day of the announcement, adjusted using the market model. *Sustainable Ownership* is the fraction of total shares outstanding held by sustainable investors. We define an investor as *Sustainable* if their portfolio-level ESG score is at the top 30% of its distribution across all the investors. *High Sustainable Ownership* (*Low Sustainable Ownership*) stocks represent the top 30% (bottom 30%) in terms of sustainable ownership. The earnings surprise is measured by the standardized unexpected earnings (SUE). *Top SUE* (*Bottom SUE*) stocks represent the top 10% (bottom 10%) in terms of earnings surprise during the announcement quarter in columns (1), (2), (3) and (5) (Quantiles 11 and 1). In columns (4) and (6), *Top SUE* (*Bottom SUE*) stocks represent the top 20% (bottom 20%) in terms of earnings surprise (Quantiles 11,10 and 1,2). Quantile 6 contains all the announcements with zero SUE. The control variables are defined in Table A.1. The standard errors are clustered by stock and quarter. *, **, and *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

y =	Announcement Day Return					
	Quantile 11 vs. 1		Quantiles 11,10 vs. 1,2		Quantile 11 vs. 1	Quantiles 11,10 vs. 1,2
	(1)	(2)	(3)	(4)	(5)	(6)
Top SUE vs. Bottom SUE =						
<i>High Sustainable Ownership</i>	0.005*** (0.002)	-0.002 (0.003)	-0.005 (0.004)	-0.001 (0.003)		
<i>Sustainable Ownership</i>					-0.042** (0.021)	-0.014 (0.018)
<i>Top SUE</i>	0.046*** (0.002)	0.044*** (0.003)	0.027*** (0.004)	0.022*** (0.002)	0.025*** (0.003)	0.022*** (0.002)
<i>High Sustainable Ownership * Top SUE</i>	-0.012*** (0.003)	-0.012*** (0.003)	-0.012*** (0.003)	-0.010*** (0.003)		
<i>Sustainable Ownership * Top SUE</i>					-0.038 (0.023)	-0.049*** (0.018)
<i>log(Market Cap)</i>			0.006*** (0.002)	0.003** (0.001)	0.006*** (0.002)	0.004*** (0.001)
<i>SUE</i>			0.028*** (0.007)	0.033*** (0.005)	0.025*** (0.005)	0.030*** (0.004)
<i>B/M</i>			2.708 (2.050)	2.638*** (0.900)	4.876** (1.919)	3.660*** (1.005)
<i>Log(# of Analysts)</i>			-0.005** (0.002)	-0.004*** (0.001)	-0.005*** (0.001)	-0.005*** (0.001)
<i>Log(# of Announcements)</i>			0.002 (0.001)	0.002* (0.001)	0.002** (0.001)	0.002** (0.001)
<i>Top Market</i>			-0.001 (0.002)	0.001 (0.002)	0.002 (0.002)	0.002 (0.001)
<i>Macro Announcement</i>			-0.001 (0.002)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)
Observations	18611	17250	15184	31628	27129	55315
R-squared	0.070	0.125	0.124	0.085	0.102	0.071
Day of week FE	No	No	Yes	Yes	Yes	Yes
Calendar month FE	No	No	Yes	Yes	Yes	Yes
Stock FE	No	Yes	Yes	Yes	Yes	Yes
Quarter FE	No	Yes	Yes	Yes	Yes	Yes

Table A.6: The Effect of Sustainable Ownership on the Immediate Price Response to Earnings: MSCI KLD.

The table shows the results from regressing the announcement-day abnormal returns on the measures of sustainable ownership and earning surprise, using the MSCI KLD dataset for ESG scores. *Announcement Day Return* is the abnormal return on the day of the announcement, adjusted using the market model. *Sustainable Ownership* is the fraction of total shares outstanding held by sustainable investors. We define an investor as *Sustainable* if their portfolio-level ESG score is at the top 30% of its distribution across all the investors. *High Sustainable Ownership* (*Low Sustainable Ownership*) stocks represent the top 30% (bottom 30%) in terms of sustainable ownership. The earnings surprise is measured by the standardized unexpected earnings (SUE). *Top SUE* (*Bottom SUE*) stocks represent the top 10% (bottom 10%) in terms of earnings surprise during the announcement quarter in columns (1), (2), (3) and (5) (Quantiles 11 and 1). In columns (4) and (6), *Top SUE* (*Bottom SUE*) stocks represent the top 20% (bottom 20%) in terms of earnings surprise (Quantiles 11,10 and 1,2). Quantile 6 contains all the announcements with zero SUE. The control variables are defined in Table A.2. The standard errors are clustered by stock and quarter. *, **, and *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

y =	Announcement Day Return					
	Quantile 11 vs. 1		Quantiles 11,10 vs. 1,2		Quantiles 11,10 vs. 1,2	
	(1)	(2)	(3)	(4)	(5)	(6)
Top SUE vs. Bottom SUE =						
<i>High Sustainable Ownership</i>	0.011*** (0.001)	0.008*** (0.002)	0.008*** (0.002)	0.006*** (0.001)		
<i>Sustainable Ownership</i>					0.026** (0.012)	0.021** (0.008)
<i>Top SUE</i>	0.037*** (0.002)	0.037*** (0.002)	0.030*** (0.003)	0.022*** (0.002)	0.023*** (0.002)	0.017*** (0.001)
<i>High Sustainable Ownership * Top SUE</i>	-0.016*** (0.001)	-0.016*** (0.002)	-0.016*** (0.002)	-0.013*** (0.001)		
<i>Sustainable Ownership * Top SUE</i>					-0.115*** (0.013)	-0.085*** (0.010)
<i>log(Market Cap)</i>			0.004*** (0.001)	0.005*** (0.001)	0.006*** (0.001)	0.004*** (0.001)
<i>SUE</i>			0.011*** (0.004)	0.018*** (0.003)	0.015*** (0.003)	0.021*** (0.002)
<i>B/M</i>			1.937 (1.515)	2.329** (0.935)	1.862* (0.979)	2.216*** (0.663)
<i>Log(# of Analysts)</i>			-0.004*** (0.001)	-0.004*** (0.001)	-0.004*** (0.001)	-0.004*** (0.001)
<i>Log(# of Announcements)</i>			-0.000 (0.001)	0.000 (0.001)	-0.000 (0.001)	0.000 (0.000)
<i>Top Market</i>			0.003** (0.002)	0.002** (0.001)	0.001 (0.001)	0.002** (0.001)
<i>Macro Announcement</i>			-0.000 (0.002)	-0.001 (0.001)	0.000 (0.001)	-0.000 (0.001)
Observations	37550	35361	29177	59937	51411	104396
R-squared	0.052	0.089	0.087	0.059	0.076	0.054
Day of week FE	No	No	Yes	Yes	Yes	Yes
Calendar month FE	No	No	Yes	Yes	Yes	Yes
Stock FE	No	Yes	Yes	Yes	Yes	Yes
Quarter FE	No	Yes	Yes	Yes	Yes	Yes

Table A.7: The Effect of Sustainable Ownership on the Immediate Price Response to Earnings: Refinitiv.

The table shows the results from regressing the announcement-day abnormal returns on the measures of sustainable ownership and earning surprise, using the Refinitiv dataset for ESG scores. *Announcement Day Return* is the abnormal return on the day of the announcement, adjusted using the market model. *Sustainable Ownership* is the fraction of total shares outstanding held by sustainable investors. We define an investor as *Sustainable* if their portfolio-level ESG score is at the top 30% of its distribution across all the investors. *High Sustainable Ownership* (*Low Sustainable Ownership*) stocks represent the top 30% (bottom 30%) in terms of sustainable ownership. The earnings surprise is measured by the standardized unexpected earnings (SUE). *Top SUE* (*Bottom SUE*) stocks represent the top 10% (bottom 10%) in terms of earnings surprise during the announcement quarter in columns (1), (2), (3) and (5) (Quantiles 11 and 1). In columns (4) and (6), *Top SUE* (*Bottom SUE*) stocks represent the top 20% (bottom 20%) in terms of earnings surprise (Quantiles 11,10 and 1,2). Quantile 6 contains all the announcements with zero SUE. The control variables are defined in Table A.3. The standard errors are clustered by stock and quarter. *, **, and *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

y =	Announcement Day Return					
	Quantile 11 vs. 1		Quantiles 11,10 vs. 1,2		Quantile 11 vs. 1	
Top SUE vs. Bottom SUE =	(1)	(2)	(3)	(4)	(5)	(6)
<i>High Sustainable Ownership</i>	0.010*** (0.002)	0.007* (0.003)	0.005 (0.004)	0.002 (0.002)		
<i>Sustainable Ownership</i>					0.038*** (0.012)	0.025** (0.010)
<i>Top SUE</i>	0.045*** (0.002)	0.043*** (0.002)	0.029*** (0.004)	0.024*** (0.002)	0.032*** (0.003)	0.025*** (0.001)
<i>High Sustainable Ownership * Top SUE</i>	-0.017*** (0.002)	-0.017*** (0.003)	-0.017*** (0.003)	-0.014*** (0.002)		
<i>Sustainable Ownership * Top SUE</i>					-0.135*** (0.015)	-0.110*** (0.011)
<i>log(Market Cap)</i>			0.006*** (0.002)	0.004*** (0.001)	0.006*** (0.001)	0.004*** (0.001)
<i>SUE</i>			0.026*** (0.005)	0.029*** (0.004)	0.026*** (0.004)	0.032*** (0.003)
<i>B/M</i>			4.734** (2.027)	3.297*** (0.963)	3.892** (1.628)	3.411*** (0.826)
<i>Log(# of Analysts)</i>			-0.003** (0.001)	-0.003*** (0.001)	-0.005*** (0.001)	-0.004*** (0.001)
<i>Log(# of Announcements)</i>			0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001* (0.001)
<i>Top Market</i>			0.005** (0.002)	0.004** (0.001)	0.002 (0.002)	0.002 (0.001)
<i>Macro Announcement</i>			0.001 (0.002)	-0.000 (0.001)	-0.001 (0.001)	-0.001 (0.001)
Observations	24667	23190	19640	40512	34971	71104
R-squared	0.066	0.115	0.120	0.082	0.097	0.069
Day of week FE	No	No	Yes	Yes	Yes	Yes
Calendar month FE	No	No	Yes	Yes	Yes	Yes
Stock FE	No	Yes	Yes	Yes	Yes	Yes
Quarter FE	No	Yes	Yes	Yes	Yes	Yes

Table A.8: Robustness to Using Measure of Sustainable Ownership Based On the Total Number of Shares Held By Institutions.

The table shows the results from regressing the announcement-day abnormal returns on the measures of sustainable ownership and earning surprise. *Announcement Day Return* is the abnormal return on the day of the announcement, adjusted using the market model. *Sustainable Ownership* is the fraction of shares held by all institutional investors outstanding held by sustainable investors. We define an investor as *Sustainable* if their portfolio-level ESG score is at the top 30% of its distribution across all the investors. *High Sustainable Ownership* (*Low Sustainable Ownership*) stocks represent the top 30% (bottom 30%) in terms of sustainable ownership. The earnings surprise is measured by the standardized unexpected earnings (SUE). *Top SUE* (*Bottom SUE*) stocks represent the top 10% (bottom 10%) in terms of earnings surprise during the announcement quarter in columns (1), (2), (3) and (5) (Quantiles 11 and 1). In columns (4) and (6), *Top SUE* (*Bottom SUE*) stocks represent the top 20% (bottom 20%) in terms of earnings surprise (Quantiles 11,10 and 1,2). Quantile 6 contains all the announcements with zero SUE. Each panel presents the results which use ESG scores from a different dataset - MSCI ESG, MSCI KLD and Refinitiv. The standard errors are clustered by stock and quarter. *, **, and *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

Panel A: MSCI ESG						
y =	<i>Announcement Day Return</i>					
Top SUE vs. Bottom SUE =	Quantile 11 vs. 1		Quantiles 11,10 vs. 1,2		Quantile 11 vs. 1	Quantiles 11,10 vs. 1,2
	(1)	(2)	(3)	(4)	(5)	(6)
<i>High Sustainable Ownership</i>	0.001 (0.002)	-0.002 (0.003)	-0.002 (0.003)	-0.002 (0.002)		
<i>Sustainable Ownership</i>					-0.012 (0.012)	-0.011 (0.010)
<i>Top SUE</i>	0.046*** (0.002)	0.044*** (0.003)	0.028*** (0.004)	0.023*** (0.003)	0.026*** (0.003)	0.022*** (0.002)
<i>High Sustainable Ownership * Top SUE</i>	-0.011*** (0.002)	-0.010*** (0.003)	-0.012*** (0.003)	-0.009*** (0.002)		
<i>Sustainable Ownership * Top SUE</i>					-0.033** (0.014)	-0.035*** (0.011)
Observations	18289	16968	14912	31340	27129	55315
R-squared	0.070	0.122	0.126	0.086	0.102	0.071

Panel B: MSCI KLD						
y =	<i>Announcement Day Return</i>					
Top SUE vs. Bottom SUE =	Quantile 11 vs. 1		Quantiles 11,10 vs. 1,2		Quantile 11 vs. 1	Quantiles 11,10 vs. 1,2
	(1)	(2)	(3)	(4)	(5)	(6)
<i>High Sustainable Ownership</i>	0.007*** (0.001)	0.006*** (0.002)	0.007*** (0.002)	0.004*** (0.001)		
<i>Sustainable Ownership</i>					0.023*** (0.007)	0.019*** (0.004)
<i>Top SUE</i>	0.037*** (0.002)	0.037*** (0.002)	0.030*** (0.003)	0.022*** (0.002)	0.024*** (0.002)	0.017*** (0.001)
<i>High Sustainable Ownership * Top SUE</i>	-0.015*** (0.002)	-0.016*** (0.002)	-0.017*** (0.002)	-0.013*** (0.001)		
<i>ESG Ownership * Top SUE</i>					-0.083*** (0.009)	-0.063*** (0.006)
Observations	37279	35154	28887	59440	51411	104396
R-squared	0.052	0.089	0.085	0.057	0.076	0.054

Panel C: Refinitiv						
y =	<i>Announcement Day Return</i>					
Top SUE vs. Bottom SUE =	Quantile 11 vs. 1		Quantiles 11,10 vs. 1,2		Quantile 11 vs. 1	Quantiles 11,10 vs. 1,2
	(1)	(2)	(3)	(4)	(5)	(6)
<i>High Sustainable Ownership</i>	0.007*** (0.002)	0.004 (0.003)	0.001 (0.003)	0.001 (0.002)		
<i>Sustainable Ownership</i>					0.010 (0.007)	0.005 (0.005)
<i>Top SUE</i>	0.047*** (0.002)	0.046*** (0.002)	0.034*** (0.003)	0.026*** (0.002)	0.028*** (0.003)	0.021*** (0.002)
<i>High Sustainable Ownership * Top SUE</i>	-0.019*** (0.002)	-0.020*** (0.003)	-0.021*** (0.003)	-0.015*** (0.002)		
<i>Sustainable Ownership * Top SUE</i>					-0.054*** (0.010)	-0.037*** (0.007)
Observations	24281	22848	19242	39968	34971	71104
R-squared	0.069	0.109	0.119	0.082	0.097	0.067

Controls	No	No	Yes	Yes	Yes	Yes
Day of week FE	No	No	Yes	Yes	Yes	Yes
Calendar month FE	No	No	Yes	Yes	Yes	Yes
Stock FE	No	Yes	Yes	Yes	Yes	Yes
Quarter FE	No	Yes	Yes	Yes	Yes	Yes

Table A.9: Robustness To Timing of ESG Scores.

The table shows the results from regressing the announcement-day abnormal returns on the measures of sustainable ownership and earning surprise. In these tests, we assign ESG scores to stocks using the calendar year rather than the fiscal year. We conduct this adjustment only for MSCI KLD and Refinitiv because for MSCI ESG we always use the most recent monthly ESG score. *Announcement Day Return* is the abnormal return on the day of the announcement, adjusted using the market model. *Sustainable Ownership* is the fraction of total shares outstanding held by sustainable investors. We define an investor as *Sustainable* if their portfolio-level ESG score is at the top 30% of its distribution across all the investors. *High Sustainable Ownership* (*Low Sustainable Ownership*) stocks represent the top 30% (bottom 30%) in terms of sustainable ownership. The earnings surprise is measured by the standardized unexpected earnings (SUE). *Top SUE* (*Bottom SUE*) stocks represent the top 10% (bottom 10%) in terms of earnings surprise during the announcement quarter in columns (1), (2), (3) and (5) (Quantiles 11 and 1). In columns (4) and (6), *Top SUE* (*Bottom SUE*) stocks represent the top 20% (bottom 20%) in terms of earnings surprise (Quantiles 11,10 and 1,2). Quantile 6 contains all the announcements with zero SUE. Each panel presents the results which use ESG scores from a different dataset - MSCI ESG, MSCI KLD and Refinitiv. The standard errors are clustered by stock and quarter. *, **, and *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

Panel A: MSCI KLD						
y =	<i>Announcement Day Return</i>					
Top SUE vs. Bottom SUE =	Quantile 11 vs. 1		Quantiles 11,10 vs. 1,2		Quantile 11 vs. 1	Quantiles 11,10 vs. 1,2
	(1)	(2)	(3)	(4)	(5)	(6)
<i>High Sustainable Ownership</i>	0.011*** (0.001)	0.008*** (0.002)	0.009*** (0.002)	0.006*** (0.001)		
<i>Sustainable Ownership</i>					0.021* (0.011)	0.012 (0.008)
<i>Top SUE</i>	0.038*** (0.002)	0.039*** (0.002)	0.031*** (0.003)	0.022*** (0.002)	0.023*** (0.002)	0.016*** (0.001)
<i>High Sustainable Ownership * Top SUE</i>	-0.017*** (0.002)	-0.018*** (0.002)	-0.019*** (0.002)	-0.014*** (0.002)		
<i>ESG Ownership * Top SUE</i>					-0.114***	-0.080*** (0.010)
Observations	37343	35141	28995	59762	51337	104265
R-squared	0.053	0.090	0.090	0.061	0.076	0.054

Panel B: Refinitiv						
y =	<i>Announcement Day Return</i>					
Top SUE vs. Bottom SUE =	Quantile 11 vs. 1		Quantiles 11,10 vs. 1,2		Quantile 11 vs. 1	Quantiles 11,10 vs. 1,2
	(1)	(2)	(3)	(4)	(5)	(6)
<i>High Sustainable Ownership</i>	0.010*** (0.002)	0.006* (0.003)	0.006* (0.003)	0.004** (0.002)		
<i>Sustainable Ownership</i>					0.071*** (0.022)	0.046** (0.019)
<i>Top SUE</i>	0.046*** (0.002)	0.046*** (0.002)	0.032*** (0.004)	0.024*** (0.002)	0.027*** (0.002)	0.021*** (0.001)
<i>High Sustainable Ownership * Top SUE</i>	-0.018*** (0.002)	-0.019*** (0.003)	-0.021*** (0.003)	-0.016*** (0.002)		
<i>Sustainable Ownership * Top SUE</i>					-0.198*** (0.032)	-0.151*** (0.025)
Observations	24134	22696	19333	40056	34643	70415
R-squared	0.068	0.116	0.121	0.079	0.096	0.067

Controls	No	No	Yes	Yes	Yes	Yes
Day of week FE	No	No	Yes	Yes	Yes	Yes
Calendar month FE	No	No	Yes	Yes	Yes	Yes
Stock FE	No	Yes	Yes	Yes	Yes	Yes
Quarter FE	No	Yes	Yes	Yes	Yes	Yes

Table A.10: Robustness To Sample Period of MSCI KLD ESG Scores.

The table shows the results from regressing the announcement-day abnormal returns on the measures of sustainable ownership and earning surprise. In these tests, we assign ESG scores to stocks using MSCI KLD during the sample period of 1992Q3-2015Q2. *Announcement Day Return* is the abnormal return on the day of the announcement, adjusted using the market model. *Sustainable Ownership* is the fraction of total shares outstanding held by sustainable investors. We define an investor as *Sustainable* if their portfolio-level ESG score is at the top 30% of its distribution across all the investors. *High Sustainable Ownership* (*Low Sustainable Ownership*) stocks represent the top 30% (bottom 30%) in terms of sustainable ownership. The earnings surprise is measured by the standardized unexpected earnings (SUE). *Top SUE* (*Bottom SUE*) stocks represent the top 10% (bottom 10%) in terms of earnings surprise during the announcement quarter in columns (1), (2), (3) and (5) (Quantiles 11 and 1). In columns (4) and (6), *Top SUE* (*Bottom SUE*) stocks represent the top 20% (bottom 20%) in terms of earnings surprise (Quantiles 11,10 and 1,2). Quantile 6 contains all the announcements with zero SUE. Each panel presents the results which use ESG scores from a different dataset - MSCI ESG, MSCI KLD and Refinitiv. The standard errors are clustered by stock and quarter. *, **, and *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

Panel A: MSCI KLD						
y =	Announcement Day Return					
	Quantile 11 vs. 1			Quantiles 11 and 10 vs. 1 and 2	Quantile 11 vs. 1	Quantiles 11 and 10 vs. 1 and 2
	(1)	(2)	(3)	(4)	(5)	(6)
High ESG Ownership	0.011*** (0.001)	0.009*** (0.002)	0.009*** (0.003)	0.006*** (0.001)		
ESG Ownership					0.029** (0.013)	0.021** (0.009)
Top SUE	0.036*** (0.002)	0.036*** (0.002)	0.028*** (0.003)	0.020*** (0.002)	0.023*** (0.002)	0.016*** (0.001)
High ESG Ownership * Top SUE	-0.016*** (0.001)	-0.018*** (0.002)	-0.018*** (0.002)	-0.014*** (0.001)		
ESG Ownership * Top SUE					-0.118*** (0.014)	-0.089*** (0.010)
Observations	32684	30622	24134	49680	42954	87240
R-squared	0.051	0.094	0.091	0.060	0.074	0.048

Controls	No	No	Yes	Yes	Yes	Yes
Day of week FE	No	No	Yes	Yes	Yes	Yes
Calendar month FE	No	No	Yes	Yes	Yes	Yes
Stock FE	No	Yes	Yes	Yes	Yes	Yes
Quarter FE	No	Yes	Yes	Yes	Yes	Yes