

Investor Integration of Earnings and ESG News

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Abstract: We examine whether and how investors integrate earnings and ESG news. This research question is important given the increasing interconnectedness of ESG and financial information as well as the extraordinary growth in the demand for ESG information by investors and regulators. During earnings announcement periods, our analyses show that investors' reaction to ESG news depends on the direction of earnings news, as investors price salient ESG news when earnings news is positive but not when earnings news is negative. Outside earnings announcement periods, our analyses show that the investor response to salient ESG news varies based on the earnings news from the prior quarter. Collectively, our results indicate that earnings performance plays a critical role in the investor response to ESG news, a finding that has substantial implications for the growing literature that evaluates how investors integrate ESG news into their trading decisions.

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1. Introduction

We examine whether and how the investor response to ESG news incorporates information about earnings. Our study provides novel evidence on how investors integrate ESG information in a capital market setting with existing financial reporting (i.e., Friedman, Heinle, and Luneva, 2024) and complements those studies that have focused on ESG news independent of other news. Our evidence is also of practical importance given the extraordinary growth in asset managers who consider ESG factors in combination with financial performance under an ESG integration approach,¹ the growing momentum for mandatory ESG reporting and integrated reporting,² and the ongoing regulatory debate over the potential use of ESG metrics in ERISA funds.³

Several studies in the ESG literature have examined whether investors integrate ESG news into their trading decisions using an event study methodology based on two approaches. The first approach identifies the average investor response to ESG news without considering when that news is disseminated (e.g., Griffin and Sun, 2013; Serafeim and Yoon, 2023). The second approach identifies the average investor response to ESG news after eliminating event days where certain financial news, such as earnings, is also released (e.g., Krüger, 2015; Serafeim and Yoon, 2022; Moss, Naughton, and Wang, 2024; Li, Watts, and Zhu, 2024). The research design in both approaches abstracts away from the fact that ESG news occurs in a system with existing financial reporting. However, under the assumption that both financial reporting and ESG news contain

¹ ESG integration is one of the approaches for responsible investment and aims to maximize financial performance by considering the financial implication of ESG factors (Sloan 2024). For example, the largest global network of investors (UN-sponsored Principles for Responsible Investment) currently has over 3,000 signatories managing over US\$100 trillion in assets. In a CNBC interview discussing the inclusive, actively managed Vanguard Baillie Gifford Global Positive Impact Stock Fund, Matt Piro, Vanguard’s global head of ESG, said “We absolutely think this positive impact fund is well done from an active standpoint because we want to deliver on both an outperformance objective while investing in those companies that contributed positively.” Source: <https://www.cnbc.com/2022/07/28/impact-investing-opportunities-with-vanguard-despite-esg-concerns.html>

² For example, EU’s Corporate Sustainability Reporting Directive (CSRD) entered into force on January 5, 2023, the SEC adopted the final climate disclosure rule on March 6, 2024, though this rule has since been stayed.

³ For example, see “Biden’s First Veto: How We Got Here In The ESG Debate” (Forbes, March 20, 2023).

information for future performance, investors are unlikely to process ESG news on a standalone basis.

In this study, we provide additional insights into how investors integrate ESG news with existing and potentially concurrent financial reporting information. We focus on earnings information because it has been shown to be one of the most salient and widely used financial information signals. Our analyses are derived from our expectation that earnings news and ESG news may not be independent sources of information about the firm's prospects. Several theoretical studies have shown that the investor reaction to a specific information signal is a joint product of available and correlated information signals (e.g., Gonedes, 1978; Holthausen and Verrecchia, 1988). In our context, investors may respond differently to the same ESG news from two separate companies if one of those companies is also reporting earnings on the same day. Similarly, investors may respond differently to the same ESG news depending on the nature of the concurrent earnings news, and vice versa. Further, the effect of earnings information on the integration of ESG news may not be restricted to earnings announcement periods. For example, investors may respond differently to otherwise similar ESG news depending on earnings news from the prior quarter. Collectively, each of these possibilities suggest that earnings information could play an important role in the integration of ESG news by investors.

We use earnings announcements to identify earnings news and data from Truvalue Labs (TVL) to identify ESG news.⁴ Our analyses measure the investor response using two short window market reaction variables commonly used in the literature: cumulative abnormal returns (*CAR*) and

⁴ The Truvalue Labs (TVL) data, described in detail in Section 3.1, has been used in several academic studies focused on the capital market response to ESG news (e.g., Serafeim and Yoon, 2022, 2023; Moss, Naughton, and Wang, 2024; Li, Watts, and Zhu, 2024). Consistent with these studies, we use the change in daily TVL Pulse score as a proxy for ESG news. *NegativeESG* (*PositiveESG*) marks salient ESG news days where the change in the TVL Pulse score from the previous trading day is less than -5% (greater than 5%).

share turnover (*Turnover*). Broadly, these variables allow us to identify two distinct aspects of the investor response. Cumulative abnormal return captures pricing implications (i.e., there was a consensus re-assessment of the firm's stock price) and share turnover captures disagreement about the information content of the news (i.e., there was trading due to disagreement among investors in their interpretation of the news). Importantly, trading due to disagreement can occur without a change in the stock price. Taken together, these two reaction variables allow us to provide insights into heterogeneous investor reactions to earnings and ESG news.

Our empirical analyses proceed in two parts. The first part focuses on the investor reaction during earnings announcement periods. Based on a sample of 90,108 earnings announcement days from January 2009 through December 2019, we find that investors' response on earnings announcement days to concurrently released ESG news depends on the direction of the earnings news. In terms of price effects, there is no detectable difference in investors' price response across different types of ESG news when earnings news is negative. In contrast, we find statistically different price responses across different types of ESG news when earnings news is positive. These results suggest that investors are indifferent to the nature of ESG news when earnings news is negative, but not when earnings news is positive. When earnings news is positive, the strongest price response is to neutral ESG news, suggesting that both positive and negative ESG news are viewed as reducing shareholder value when compared with neutral ESG news on positive earnings announcement days.

In terms of investor disagreement, we also find that share turnover varies for different combinations of earnings and ESG news. Share turnover is higher when earnings news is either positive or negative, and is at its highest when both earnings and ESG news are negative. This result indicates that the uncertainty created by negative earnings news is magnified when it is

accompanied by negative ESG news. In addition, we find that share turnover is higher for both positive and negative ESG news when compared to neutral ESG news, regardless of the direction of the earnings news. Consistent with heterogeneous investor preference for ESG performance, this result indicates that directional ESG news generates higher investor disagreement, even when there is no concurrent change in the stock price.

The second part of our empirical analyses focuses on the investor reaction on ESG news days that occur outside of the earnings announcement period. Using a sample of 394,236 ESG news announcement days over the same January 2009 through December 2019 time period, we find that the price response to ESG news is heavily influenced by earnings information from the prior quarter (i.e., the most recent earnings news), especially when that earnings information was negative. The price response to all types of ESG news is lower for firms that missed their earnings forecast in the prior quarter. In addition, we find that the difference in the price response across firms that missed versus firms that beat the consensus earnings forecast is significant for both positive and negative ESG news. Overall, the variation in the price response indicates that the prior quarter's earnings information plays a significant role in the investor response to ESG news outside of earnings announcement periods.

Similar to our first set of analyses, we also document higher levels of investor disagreement to directional ESG news on non-earnings announcement days. On ESG news days, share turnover is higher for both positive and negative ESG news when compared to neutral ESG news, regardless of whether the firm met its earnings target in the prior quarter. In addition, greater disagreement among investors to ESG news occurs when firms either missed or beat their earnings target in the prior quarter. Once again, these results indicate that earnings news plays a critical role in how investors process and respond to ESG news.

Collectively, our analyses reveal several new stylized facts about how investors integrate financial and ESG news that are not easily predicted by the existing literature. For example, our finding that the investor response to negative earnings news is not mitigated by positive ESG news is counter to the insurance effect of ESG documented in other settings (e.g., Minor and Morgan, 2011; Lins, Henri, and Tomayo, 2017). Similarly, to the extent that investors are influenced by non-pecuniary preferences for ESG news (e.g., Fama and French, 2007; Friedman and Heinle, 2016; Goldstein, Kopytov, Shen, and Xiang, 2024), we would not have found different investor responses to the same type of ESG news based on differences in earnings news. In addition, our finding that earnings information from the prior quarter continues to strongly influence investors' response to ESG news, particularly when that earnings news was negative, has important implications for prior literature. For example, prior evidence of an average investor response to ESG news could be partially attributable to investors re-evaluating prior earnings news in light of new post-announcement information (e.g., Freeman and Tse, 1989).

We supplement the above analyses with two tests that provide additional context for our results. First, we investigate whether investors' indifference to ESG news when earnings news is negative arises, in part, because investors expend more of their limited resources investigating financial performance rather than the valuation implications of ESG news for firms that miss earnings targets. Using conference call transcripts, we find that the proportion of questions about ESG issues is lower when firms' miss their consensus earnings forecast, consistent with investors shifting their focus away from understanding ESG news when firms' earnings news is negative.

Second, we provide additional context for how investors integrate financial and ESG news by examining how EDGAR downloads vary based on the occurrence and nature of the ESG news. We find that EDGAR downloads of financial filings are substantially higher on ESG news days

than a typical trading day, and that downloads are especially high when the ESG news is directionally positive or negative, but not strongly so. These download results provide additional evidence that investors rely on financial filings when evaluating ESG news and that investors seek out financial filings more often when the valuation implications of ESG news is less obvious.

We make several contributions to the literature. First, we contribute to the literature that investigates how investors evaluate information from different sources (i.e., Beyer, Cohen, Lys, and Walther, 2010), and more specifically, how investors integrate ESG information in a capital market setting with existing financial reporting (i.e., Friedman, Heinle, and Luneva, 2024). Under the assumption that both earnings and ESG news contain information for future cash flows, we posit and find that investors integrate and use both information sources. Our finding that investors do not respond to ESG news when earnings news is negative is consistent with investors substituting away from less verifiable, soft information (i.e., ESG news). This aspect of our results should inform the regulatory debate on mandatory ESG reporting and integrated reporting worldwide.

Our findings also add to the literature that uses short-window event studies to investigate the investor reaction to ESG news. The first part of our analyses extends prior studies by extending the analysis to earnings announcement periods and by examining the effect of concurrently released earnings news on investor integration of ESG news. The second part of our empirical analyses extends prior studies by investigating whether earnings news is a factor that influences the investor response to ESG news outside of earnings announcement periods. Collectively, our analyses provide useful context for prior studies that have used an event study methodology to document whether and how investors integrate ESG information into their trading decisions. In addition, by focusing on the release of firm-specific earnings information, our methodology and

findings complement prior studies that examine how investors integrate ESG information based on macroeconomic conditions, such as the 2008 financial crisis and the more recent COVID-19 crisis (e.g., Lins, Servaes, and Tamayo, 2017; Demers, Hendrikse, Joos, and Lev, 2021; Glossner, Matos, Ramelli, and Wagner, 2024).

Lastly, our study relates to the recent theoretical literature that investigates whether stock prices are influenced by heterogenous investor preferences for socially responsible activities (e.g., Friedman and Heinle, 2016; Goldstein, Kopytov, Shen, and Xiang, 2024). Our empirical findings are consistent with certain investor groups trading in opposite directions based on the same information (i.e., increased trading volumes for ESG information across all directions of earnings news). However, *on average*, investors exhibit a “conditional taste” behavior where they trade and agree on ESG information only when financial performance targets are met. The differential reaction between stock price and trading volume we document are also consistent with Kim (2024), which shows that the heterogenous preferences of market participants with respect to carbon net-zero pledges are reflected in trading volume but masked in price reactions.

We proceed as follows. Section 2 provides the literature review while Section 3 outlines our data collection and sample construction. We present our research design and results in Section 4 and then conclude in Section 5.

2. Literature Review

There is a broad literature examining the connection between ESG and financial performance—a view typically captured by the phrase “doing well by doing good” (e.g., Plumlee, Brown, Hayes, and Marshall, 2010; Dhaliwal, Li, Tsang, and Yang, 2011; Servaes and Tamayo, 2012; Lys, Naughton, and Wang, 2015; Naughton, Wang, and Yeung, 2019). A subset of this

literature examines how investors incorporate ESG factors into stock performance evaluation, typically with the goal of enhancing risk adjusted returns (Sloan, 2024). In general, these studies examine short-window investor responses to ESG news using an event study methodology. For example, Griffin and Sun (2013) document a positive stock price response to the voluntary disclosure of greenhouse gas or carbon emissions information. Krüger (2015) shows that investors respond strongly negatively to negative ESG events and weakly negatively to positive ESG events. Serafeim and Yoon (2022) document a market reaction to financially material ESG news, with a larger reaction for positive news. Similarly, Li, Watts, and Zhu (2024) show that while retail investors trade on ESG news events, they primarily trade on this information when they deem it to be financially material. In contrast, Haley, Shaffer, and Sloan (2024) examine the stock market reaction to the release of corporate sustainability reports incorporating SASB metrics and find little evidence that these reports provide decision-useful information to investors. Moss, Naughton, and Wang (2024) document overall market responses to firm-initiated ESG press releases but fail to find evidence that these ESG disclosures inform retail investors' buy and sell decisions.

Despite the fact that this literature is focused on understanding how investors integrate ESG information into their trading decisions, the empirical approach in these studies do not typically consider the fact that there is existing and potentially concurrent financial reporting. To the best of our knowledge, the influence of concurrent financial reports has only been directly examined in an experimental setting. Specifically, Bucaro, Jackson, and Lill (2020) provide either separate or integrated ESG and financial disclosures about a hypothetical firm to participants recruited via the online platform Amazon Mechanical Turk. The disclosures depict negative ESG news and positive financial news. The study finds that the attractiveness of the hypothetical firm as a potential

investment is lower when the disclosures are separate, suggesting that separate reports result in investors placing more weight on ESG performance.

In most empirical archival studies, the investor response to ESG news is examined independently of financial news, an approach that is typically accomplished by eliminating from the analyses ESG disclosures that occur during earnings announcement periods. For example, when investigating whether retail investors respond to ESG news, Li, Watts, and Zhu (2024) and Moss, Naughton, and Wang (2024) eliminate from their analysis ESG news disseminated during earnings announcement periods. While this research design choice allows for clean inferences on the effect of stand-alone ESG disclosures, it does not provide insights into how investors use other existing information such as earnings news while integrating ESG news.

This approach also does not fully align with the theoretical literature, which generally views the investor reaction to a specific information signal as the joint product of available and correlated information signals (e.g., Gonedes, 1978; Holthausen and Verrecchia, 1988). Consistent with theory, empirical studies have provided evidence for investors' interdependent use of concurrent information signals such as earnings and other disclosures including dividends, operating data, and future earnings guidance (e.g., Kane, Lee, and Marcus, 1984; Hoskin, Hughes, and Ricks, 1986; Atiase, Li, Supattarakul, and Tse, 2005). In our context, if both earnings and ESG news contain information for future cash flows (e.g., Edmans, 2023), then earnings information will play an important role in the integration of ESG news by investors.

3. Data and Sample

3.1 Truvalue Labs (TVL) Data

We use Truvalue Labs (TVL) data as our source of ESG information. This data covers the period January 2009 through December 2019. We end the sample in 2019 because TVL was

acquired by FactSet, at which point data was no longer made freely available to academic researchers. The advantage of TVL data over other sources of ESG information (e.g., MSCI, Refinitiv, etc.) is the frequency and coverage of the data. More specifically, unlike traditional ESG data sets that are focused on annual ratings and periodic corporate disclosure, TVL uses machine learning to find ESG-relevant articles from a variety of sources, including reports by analysts, various media, advocacy groups, and government regulators. TVL emphasizes that its measures focus on vetted, reputable, and credible sources that are likely to generate new information and insights for investors. TVL employs a proprietary system that uses natural language processing to interpret semantic content that allows for the classification of information according to degrees of positivity or negativity and uses this system to produce a daily Pulse score, which captures all current information about the firm's ESG performance. According to TVL, the change in the Pulse score captures new information (i.e., the Pulse score only changes when there is new information), and the score is specific to visible events about which the news articles are written.⁵ Therefore, we use the change in daily TVL Pulse score ($\% \Delta ESGScore$) as a proxy for new ESG information. Our use of the Pulse score is consistent with recent studies that have examined the investor response to ESG news announcements (e.g., Serafeim and Yoon, 2022, 2023; Moss, Naughton, and Wang, 2024; Li, Watts, and Zhu, 2024).

3.2 Sample Selection

Table 1 Panel A presents the initial sample selection procedure. The TVL data consists of 18,707,516 firm-days covering the period from January 2009 to December 2019. We merge this sample with CRSP, resulting in 9,947,874 firm-days (5,409 unique firms). We then make several

⁵ See Section 3.1 in Serafeim and Yoon (2023) for a detailed description and interpretation of the TVL data. Another ESG news data source that has been used in various studies is RepRisk. However, RepRisk only focuses on events with negative ESG risk implications.

adjustments to filter the sample. First, we require firms to be traded on a US exchange (CRSP share codes 10, 11, 12) and have a share price of at least \$1 at the end of the prior quarter. Next, we exclude observations where the SIC code, change in TVL Pulse score, or 3-day stock return are missing. Lastly, we eliminate observations that have missing values for any of the control variables listed in Appendix A. After applying all of these filters, the sample contains 3,712 unique firms and 5,529,851 firm-days from January 2009 to December 2019.

Table 1 Panel B further divides the 5,529,851 firm-days into earnings announcement days (column 1) and non-earnings announcement days (column 2), and provides the frequency for these days by three groups (i.e., Negative ESG News, Neutral ESG News, and Positive ESG News). Our sample of EA days consists of the entire 90,108 earnings announcement days in column 1. Our sample of ESG news days is defined as non-earnings announcement days with ESG news (i.e., $\% \Delta ESGScore \neq 0$), which yields 394,236 days as shown in column 3. These two samples (earnings announcement days and ESG news days) contain 484,344 firm-days and represent 3,690 unique firms in total.

Table 1 Panels C and D provide sample composition by year and by industry. Panel C shows that there is an increasing pattern in the number of firm-years through 2015, at which point the number of firm-years remains relatively stable. The pattern in the number of firm-days shows slightly more variation, with the most observations in 2015 and 2019. Panel D shows that SIC codes covering Manufacturing make up about 38.8 percent of the sample of firm-days, which is consistent with the general distribution of firms across SIC codes.

3.3 Variable Definitions

Table 2 presents the descriptive statistics for the sample. We measure investor responses using two short window market reaction variables commonly used in the literature: cumulative

abnormal returns (*CAR*) and share turnover (*Turnover*). *CAR* is the cumulative market-adjusted return during trading days $[-1,1]$ multiplied by 100, and *Turnover* is the average number of shares traded scaled by the number of shares outstanding during trading days $[-1,1]$ multiplied by 100. Broadly, *CAR* captures the consensus change in market participants' value of the firm, while *Turnover* captures disagreement about the market value of the firm across investors (Beaver, 1968). In combination, these two market reaction variables allow us to differentiate between three important scenarios: (1) news creates disagreement about the stock price among investors (change in turnover) and there is a consensus re-assessment of the firm's stock price (change in price), (2) news creates disagreement about the stock price among investors (change in turnover) but there is no consensus re-assessment of the firm's stock price (no change in price), and (3) news does not create any disagreement about the stock price among investors (no change in turnover and no change in price).

We use the change in daily TVL Pulse score as a proxy for new ESG information. We create the binary variable *NegativeESG* (*PositiveESG*) and set it equal to one if the change in the TVL Pulse score from the previous trading day is less than -5% (greater than 5%). We use the \pm 5% threshold to identify the most salient ESG news events, as those cutoffs correspond to approximately the highest and lowest quintiles of the observations in our sample conditional on a change in *ESGScore*. Salient ESG news occurs on 3.4% of all trading days. Appendix B provides examples of these events.

We also control for a comprehensive set of variables typically employed when assessing differences in market responses around earnings periods (e.g., deHaan, Shevlin, and Thornock, 2015; deHaan, Madsen, and Piotroski, 2017). These variables, defined in Appendix A, include firm size (*Size*), market-to-book ratio (*M/B*), total debt divided by total assets (*Leverage*), quarterly

sales growth (*SalesGrowth*), number of analysts covering the firm (*Analysts*), standard deviation of returns over the prior three months (*RetVol*), percentage of shares held by institutional investors (*InstOwn*), earnings persistence (*EarnPersist*), number of days between the earnings announcement and fiscal quarter end (*ReportLag*), and an indicator for firms reporting negative earnings (*Loss*).

The summary information for the control variables is consistent with what is expected for a study that covers the largest publicly traded firms. In particular, the descriptive information in Table 2 indicates that firms in our sample have an average market cap of approximately \$8.9 billion, have a strong analyst following (the average number of analysts is approximately 10), and have a very high percentage of institutional investors (on average, 73.1 percent of shares are held by institutional investors). The average market-to-book ratio of 3.795 is consistent with what is typical for the S&P 500 index. During our sample period, about 17.6 percent of reported earnings are negative.

4. Research Design and Results

4.1 Distribution of ESG News

We begin our analyses by providing descriptive information on possible differences in ESG news variables across EA and non-EA days. This descriptive information is important because it allows us to observe whether there are differences in the underlying content of ESG news based on the timing of when it is released. Table 3 provides information on $\% \Delta ESGScore$ as well as information on the average investor response using *CAR* and *Turnover* across negative and positive ESG news days.

We first examine the magnitude and occurrence of ESG news across EA and non-EA days. The average percentage change in *ESGScore* is about 0.56% on EA days compared with 0.66% on

non-EA days, a difference that is not statistically significant. There is also no difference in the average percentage change in the absolute value of *ESGScore*. These results suggest that the content of ESG news does not differ substantially across EA and non-EA days. However, the relative occurrence of salient ESG news days is higher on EA days than non-EA days for both negative (2.4% vs 1.7%) and positive ESG news (2.2% and 1.7%). Taking the magnitude and relative occurrence results together suggests that even though the content and overall distribution of ESG news does not differ across EA and non-EA days, salient ESG news releases are more likely to be provided on EA days.

Next, we examine the investor response to negative and positive ESG news days across EA and non-EA days. We conduct this test because investor attention is likely to be higher during earnings announcement periods, and this difference in attention could be associated with differences in capital market outcomes. Both *CAR* and *Turnover* are statistically different on EA versus non-EA days. For example, *Turnover* is almost double—2.24 (2.03) on EA days when the ESG news is negative (positive) compared with 1.15 (1.13) on non-EA days when the ESG news is negative (positive). Since this comparison focuses only on salient ESG news days, the results indicate that the investor response to otherwise comparable ESG news is significantly greater on EA days when compared to non-EA days.

These two sets of findings are notable given that several studies investigating the importance of ESG news to investors have excluded ESG news provided during earnings announcement periods from their analyses (e.g., Serafeim and Yoon, 2022; Moss, Naughton, and Wang, 2024; Li, Watts, and Zhu, 2024).

4.2 Investor Response to ESG News on Earnings News Days

Our first set of analyses narrows in on earnings announcement days to provide insights into the investor response to the combination of ESG and earnings news. For both earnings and ESG news, we use three groupings that are broadly intended to identify negative, neutral, and positive news. The three groupings of ESG news are *NegativeESG*, *NeutralESG*, and *PositiveESG*. As previously described in Section 3.2, *NegativeESG* (*PositiveESG*) is a binary variable set equal to one if the change in the TVL Pulse score from the previous trading day is less than -5% (greater than 5%), which corresponds roughly to the bottom (top) quintile of score changes in response to ESG news. *NeutralESG* captures all other ESG news events, which are those where the change in the TVL Pulse score is between -5% and 5%. The three groupings of earnings news are derived from the direction of the earnings surprise. *MissEst* (*MeetEst*) [*BeatEst*] is an indicator variable set to one if the firm missed its forecast (met or beat its forecast by no more than one penny) [beat its forecast by more than one penny]. The intersection of these three different categories for each type of ESG and earnings news produces nine distinct groups. Examining the investor response to these nine distinct groupings provides a broad view into the integration of earnings and ESG news.

Table 4 Panel A presents the number of observations in each of the nine groups. Most observations correspond to *NeutralESG*, with 2.4% (2.2%) of observations corresponding to negative (positive) news. This distribution is expected and indicates that our categorization of ESG news events identifies salient ESG news days. The distribution of observations across earnings performance groups is consistent with prior literature, with 32.9% (50.5%) of observations missing (beating) the consensus earnings estimate. Our data does not indicate that there are strategic combinations of earnings and ESG news. An example of a strategic combination would be if positive ESG news was more common when earnings news is negative. The distribution of positive

and negative ESG news across the *MissEst* and *BeatEst* groups are comparable, indicating that ESG news does not appear to be strategically combined with earnings news.

The average investor response measured using *CAR* (*Turnover*) is presented in Table 4 Panel B (D) and graphed in Panel C (E). We focus first on the investor response to earnings news, which is depicted in Panels C and E as green (*BeatEst*), yellow (*MeetEst*), and red (*MissEst*) lines. In Panel C, there is a clear difference in the level of *CAR* across each earnings group with *CAR* increasing across *MissEst*, *MeetEst*, and *BeatEst*. The unconditional average return response is approximately -2.89% for *MissEst*, -0.48% for *MeetEst*, and 2.26% for *BeatEst*. Panel E shows that *BeatEst* and *MissEst* have similar levels of *Turnover* while *MeetEst* is significantly lower. Overall, these results are consistent with earnings news having an impact on both investors' trading of companies as well as the market's equilibrium valuation.

Next, we focus on the investor response to ESG news, which is depicted on the x-axis of Panels C (*CAR*) and E (*Turnover*). Our inferences are based on differences across ESG groups for each earnings group. Panel C shows a similar *CAR* across *NegativeESG*, *NeutralESG*, and *PositiveESG* for both *MissEst* and *MeetEst* as indicated by the generally flat red and yellow lines. For example, in the *MissEst* groupings, the average return response is -2.97%, -2.89%, and -2.72% across each of the three types of ESG news. This pattern is consistent with no differential price reaction to directionally different ESG news when firms concurrently release negative earnings news. By contrast, the green line, *BeatEst*, takes the form of an inverted wide "V" with *CAR* increasing from 1.39% (*NegativeESG*) to 2.29% (*NeutralESG*) and then decreasing to 1.87% (*PositiveESG*). This non-linear pattern indicates that investors respond less favorably to positive earnings news when there is concurrent ESG news that is either positive or negative. One possible explanation for this reaction is perceived ambiguity and uncertainty with respect to investors'

interpretation of ESG news. While negative ESG news could be interpreted as having negative implications for firm value, positive ESG news could signal potential agency problems if the ongoing ESG initiatives are not viewed as value-enhancing.

The *Turnover* results are shown in Panels D and E. Across all three earnings groups, the lines in Panel E form a “V” shape. *Turnover* for *NegativeESG* and *PositiveESG* is larger than *NeutralESG* across the three groups of earnings news, and *NegativeESG* exhibits higher turnover than *PositiveESG*. For example, within the *MissEst* group, *Turnover* is 2.44 for *NegativeESG*, 1.70 for *NeutralESG*, and 2.07 for *PositiveESG*. This pattern of results, confirmed by statistical tests shown in Table 4 Panel D, indicates that investors’ trading behavior within earnings groupings are influenced by differences in ESG news.

Taken together, the results in Table 4 suggest that ESG news impacts investors’ trading behavior but that the level of disagreement about firm valuations across these investors is such that the market’s equilibrium price is not impacted, except when earnings news is positive. In other words, certain investor groups trade in opposite directions based on the same information as evidenced by the increased turnover in response to ESG news across all directions of earnings news. However, on average, investors exhibit a “conditional taste” behavior where they trade and agree on ESG information only when financial performance targets are met as evidenced by the significant price response to ESG information only when firms beat earnings expectations.⁶

Next, we expand these comparisons to a multivariate analysis using the following specification:

⁶ In untabulated tests, we find that our inferences are the same when we replace the earnings news groupings with the direction of earnings level (i.e., earnings ≥ 0 vs. earnings < 0).

$$\begin{aligned}
INVESTOR_RESPONSE_{i,t} = & \alpha + \beta_1 NegativeESG_{i,t} + \beta_2 PositiveESG_{i,t} + AbsSurp_{i,t} \\
& + ESGScore_{i,t} + \sum \gamma_j Controls_{i,t} + Fixed\ Effects + \varepsilon_{i,t} \quad (1)
\end{aligned}$$

We continue to measure *INVESTOR_RESPONSE* using *CAR* and *Turnover*. We estimate equation (1) separately for the three types of earnings news days: *MissEst*, *MeetEst*, and *BeatEst*. We control for the absolute earnings surprise (*AbsSurp*) because of the possibility that the investor response may vary based on the magnitude of the new information about earnings and the firm’s overall ESG Rating (*ESGScore*) because of the possibility that the investor response to new ESG information might vary based on the firm’s existing commitment to ESG. We also control for the comprehensive set of variables discussed in Section 3.3. Additionally, we include two sets of fixed effects, firm and date, to fully absorb time-invariant cross-firm heterogeneity and time trends.⁷ The inclusion of firm fixed effects implies that the specification using *Turnover* captures abnormal turnover as the fixed effect captures the baseline at the firm level for that variable.

The results of equation (1) are provided in Table 5. Because an indicator for *NeutralESG* is omitted from the regression, the coefficient estimates on *PositiveESG* and *NegativeESG* measure the difference between these groups and *NeutralESG*. Overall, the multivariate analyses confirm our primary conclusions from Table 4. First, there are no equilibrium pricing implications of ESG news when firms miss or meet earnings estimates. In Columns 1 (*MissEst*) and 2 (*MeetEst*), the coefficient estimates on *NegativeESG* and *PositiveESG* are not statistically different from zero or from each other. Second, there are equilibrium pricing implications of ESG news when firms beat earnings expectations. In Column 3 (*BeatEst*), *NegativeESG* is significantly negative, reflecting the uncertainty associated with negative ESG news relative to either positive or other ESG news.

⁷ We obtain similar results when using industry fixed effects instead of firm fixed effects. We also confirm that our fixed effect structure is appropriate using the diagnostic procedures in Breuer and deHaan (2024).

Third, investors use ESG news for their trading decisions. In Columns 4 (*MissEst*) and 6 (*BeatEst*), both *NegativeESG* and *PositiveESG* are significantly positive, and *NegativeESG* is significantly greater than *PositiveESG*. Collectively, these results provide additional support for the conclusion that ESG news impacts investors' trading decisions but that the level of disagreement on firm valuations across these investors is such that the market's equilibrium price is not impacted except when earnings news is positive.

Our results in Tables 4 and 5 show that investors agree on the valuation implications of ESG information only when earnings information is positive. This result could manifest, at least in part, because investors expend more of their limited resources understanding the financial problems faced by firms not beating analyst expectations instead of understanding ESG information. We investigate if there is support for this explanation by examining whether the relative importance of ESG topics on conference calls varies based on earnings news. We generate the variable *ESGQuestions* using the number of ESG sentences spoken by conference call participants (excluding management), scaled by the total number of sentences in the Q&A portion of the earnings conference call. ESG sentences are classified by the fine-tuned FinBERT model in Huang, Wang, and Yang (2023). This variable proxies for investor focus on ESG topics because higher values for this variable indicate that a greater proportion of the conference call is dedicated to ESG topics. We investigate how investor interest in ESG varies based on the nature of the earnings news using the following specification:

$$\begin{aligned}
 ESGQuestions_{i,t} = & \alpha + \beta_1 MissEst_{i,t} + \beta_2 BeatEst_{i,t} + AbsSurp_{i,t} + ESGScore_{i,t} \\
 & + \sum \gamma_j Controls_{i,t} + Fixed\ Effects + \varepsilon_{i,t}
 \end{aligned}
 \tag{2}$$

MissEst (*MeetEst*) [*BeatEst*] is an indicator variable set to one if the firm missed its forecast (met or beat its forecast by no more than one penny) [beat its forecast by more than one penny]. The remaining variables are the same as those included in equation (1).

Table 6 presents the results. In Column 1, we include *MissEst* and *BeatEst* as independent variables with the result that *MeetEst* is the baseline outcome. The coefficient on *MissEst* is significantly negative and significantly less than *BeatEst*. In Column 2, we include *MissEst* as the independent variable, making *MeetEst* and *BeatEst* the baseline outcome. The coefficient on *MissEst* continues to be significantly negative when compared to this baseline. The results in both columns indicate that the proportion of questions about ESG information is lower when the firm misses its consensus earnings expectation. This finding is consistent with investors shifting their focus away from understanding ESG news when a firm's financial performance is problematic.

4.3 Investor Response to Earnings News on ESG News Days

Our next set of analyses shifts the focus to the investor response on ESG news days instead of EA days. We conduct these tests to investigate whether investors continue to rely on prior earnings information as part of integrating ESG news. Conceptually, since the prior earnings news has already been priced based on the information available at the time it was released, the effects we document in these tests can reasonably be attributed to investors integrating the newly disseminated ESG news with the prior earnings news. Our tests focus on event days outside the earnings announcement period where ESG news is provided. Summary information on the sample, provided in Table 1 Panel B, shows that there are more ESG news days (394,236) than there are earnings announcements days (90,108). In total, there are 183,102 ESG news days with substantial news that is either negative or positive, representing just under half of all non-zero ESG news days. As with our previous analyses, we form nine groupings of ESG and earnings news. The three

groupings of ESG news are the same as those used in Section 4.2. However, given that we are focused on days outside of the earnings period, we use the most recent earnings news to produce the three earnings news groups. $MissEst_{q-1}$ ($MeetEst_{q-1}$) [$BeatEst_{q-1}$] is an indicator variable set to one if the firm missed its forecast (met or beat its forecast by no more than one penny) [beat its forecast by more than one penny] in the quarter immediately preceding the quarter containing the ESG event date.

Our analyses use the same two measures of investor response, with the CAR ($Turnover$) results provided in Table 7 Panel B (D) and depicted graphically in Table 7 Panel C (E). Focusing first on the investor response to ESG news, the overall average return response is approximately 0.01%, 0.03%, and 0.06% for $NegativeESG$, $NeutralESG$, and $PositiveESG$, respectively, suggesting that ESG news is priced on ESG news days. However, a closer examination of the return response conditional on earnings reveals an interesting pattern. Specifically, examining Panel C and using $NeutralESG$ as the baseline group, $NegativeESG$ deviates from $NeutralESG$ only within the $MissEst_{q-1}$ group and $PositiveESG$ deviates only within the $BeatEst_{q-1}$ group. This pattern of results is consistent with ESG news being priced only when its direction aligns with the direction of recent earnings news. Panel E shows that, unconditionally and conditionally across all three earnings groups, $NegativeESG$ and $PositiveESG$ have similar levels of $Turnover$ with $NeutralESG$ having substantially lower $Turnover$. This pattern is consistent with more salient ESG news events increasing investor disagreement about firm value.

Next, we focus on the investor response to earnings news, depicted on the x-axis of Table 7 Panels C (CAR) and E ($Turnover$). Panel C shows CAR has a positive slope across earnings news groups within all three types of ESG news. For example, for $PositiveESG$ days, CAR increases from 0.01% for $MissEst_{q-1}$, to 0.05% for $MeetEst_{q-1}$, and to 0.09% for $BeatEst_{q-1}$. The increasing

slope indicates that the most recently disclosed earnings news impacts pricing on ESG news days even when, as an independent signal, the earnings news has already been priced. Panel E shows that, both unconditionally and across all three ESG groups, *Turnover* exhibits a “V” pattern where *MissEst_{q-1}* is larger than *BeatEst_{q-1}* and both are larger than *MeetEst_{q-1}*. For example, unconditional on ESG news, the overall average *Turnover* is 1.16, 0.98, and 1.13 for *MissEst_{q-1}*, *MeetEst_{q-1}*, and *BeatEst_{q-1}*, respectively.

This finding expands the result in Table 4 from the earnings announcement period to the non-earnings announcement period. It highlights the fact that even when salient ESG news arises outside of EA days, investors respond to the news differently based on the most recent earnings news. Interestingly, our results indicate that ESG news is only priced when it aligns with the direction of financial news. In particular, we find that negative earnings news strongly influences the price response to subsequent negative ESG news. These results have important implications for studies that focus on the market reaction to ESG news outside of earnings announcements, since the direction of the most recent earnings news plays a differentiating role in how investors respond.

Next, we expand these univariate comparisons to a multivariate analysis using the following specifications:

$$\begin{aligned}
 INVESTOR_RESPONSE_{i,t} = & \alpha + \beta_1 MissEST_{i,q-1} + \beta_2 BeatEST_{i,q-1} + AbsSurp_{i,t} \\
 & + ESGScore_{i,t} + \sum \gamma_j Controls_{i,t} + Fixed\ Effects + \varepsilon_{i,t} \quad (3)
 \end{aligned}$$

We estimate equation (3) separately for the three types of ESG news (i.e., *NegativeESG*, *NeutralESG*, and *PositiveESG*). We continue to measure *INVESTOR_RESPONSE* using *CAR* and *Turnover*. The control variables and fixed effects mirror those used in equation (1). *MissEst_{q-1}* and *BeatEst_{q-1}* are indicator variables based on the group definitions previously discussed. We omit the

MeetEst_{q-1} indicator variable from the regression, so the coefficients on *MissEst_{q-1}* and *BeatEst_{q-1}* are estimated relative to the *MeetEst_{q-1}* baseline.

The results of equation (3) are shown in Table 8. The results support our main inferences from Table 7. The difference in the coefficients on *MissEst_{q-1}* and *BeatEst_{q-1}* in both the *CAR* and *Turnover* specifications are statistically significant on both positive and negative ESG news days but not on neutral ESG news days. This difference indicates that the investor response to salient ESG news is based, in part, on the nature of the earnings news from the prior quarter. When examining *CAR* as the dependent variable, the coefficient on *BeatEst_{q-1}* is significantly larger than the coefficient on *MissEst_{q-1}* (p-values = 0.004 for *NegativeESG* and 0.017 for *PositiveESG*), indicating that otherwise similar ESG news generates a greater price response when the firm beat rather than missed earnings expectations in the prior quarter. In contrast, when *Turnover* is the dependent variable, the coefficient on *MissEst_{q-1}* is larger than *BeatEst_{q-1}* (p-values = 0.000 for *NegativeESG* and 0.002 for *PositiveESG*). This result is consistent with more investor disagreement on ESG news days when the firm's earnings news from the prior quarter is negative.

4.4 Investor Downloads of SEC Filings

Our final analysis examines whether the occurrence and nature of ESG news integration generates differences in investors' use of financial information. Specifically, we examine whether investors are more or less likely to obtain SEC filings from EDGAR on ESG news days, and if so, whether the nature of the ESG news influences the frequency with which SEC filings are downloaded.

We first examine the average number of 10-K and 10-Q (i.e., 10-X) downloads from the SEC EDGAR website for the three days centered on each EA day and non-EA day. We focus on human downloads based on the classification in Drake, Roulstone, and Thornock (2015). We find

that there are an average of 97 (untabulated) human 10-X EDGAR downloads on earnings announcement days. Outside of the earnings announcement periods, there are an average of 50 (untabulated) such downloads on days that do not have any new ESG information (e.g., $\% \Delta ESGScore = 0$). In contrast, 10-X EDGAR downloads on days with new ESG information (i.e., $\% \Delta ESGScore \neq 0$) are substantially higher with an average of 64 (untabulated) downloads per day.

To further understand how investors integrate financial information with ESG news, we follow our prior analyses and disaggregate ESG news days based on the percentage change in a firm's TVL Pulse score. As previously described in Section 3.2, *NegativeESG* (*PositiveESG*) is a binary variable set equal to one if the change in the TVL Pulse score from the previous trading day is less than -5% (greater than 5%). *NeutralESG* captures all other ESG news events, which are those where there is a change in the TVL Pulse score between -5% and 5%. The results in Table 9 indicate that the number of downloads is substantially higher on *NeutralESG* days (358) when compared to both *NegativeESG* and *PositiveESG* days (111 and 112, respectively).

We interpret Table 9 as providing additional evidence that investors seek out financial information to help contextualize ESG news and its implications for firm value. Our finding that there are fewer investor downloads for larger relative to smaller changes in the TVL Pulse score, across both positive and negative changes, is consistent with investors utilizing financial information to a greater extent when the valuation implications of ESG news are less obvious. While these tests provide support for our conclusion that investors rely on financial news while integrating ESG news, they primarily provide additional context for this conclusion because our primary analyses focus on granular differences in the nature of the earnings news.

5. Conclusion

We conduct two sets of analyses that provide novel insights into when and how investors integrate financial and ESG news into their trading decisions. Our first set of analyses examines how investors respond to the combination of earnings and ESG news on earnings announcement days. Our second set of analyses examines whether and how investors rely on earnings information from the prior quarter when integrating newly released ESG news. Collectively, these analyses provide a number of insights into whether and how investors integrate ESG and earnings news. During earnings announcement periods, our analyses show that investors' reaction to ESG news is conditional on the earnings news, as investors price salient ESG news when earnings news is positive but not when earnings news is negative. Our analyses of ESG news days show that the investor response to salient ESG news varies based on the earnings news from the prior quarter. Collectively, our results indicate that earnings news plays a critical role in the investor response to ESG news, a finding that has substantial implications for the growing literature that evaluates how investors process and integrate ESG news.

References

- Atiase, R.K.; H. Li; S. Supattarakul; and S. Tse. 2005. Market reaction to multiple contemporaneous earnings signals: Earnings announcements and future earnings guidance. *Review of Accounting Studies* 10: 497–525.
- Beaver W.H. 1968. The information content of annual earnings announcements. *Journal of Accounting Research* 6: 67–92.
- Beyer, A.; D. Cohen; T. Lys; and B. Walther. 2010. The financial reporting environment: Review of the recent literature. *Journal of Accounting and Economics* 50: 296–343.
- Blankespoor, E.; E. deHaan; J. Wertz; and C. Zhu. 2019. Why do individual investors disregard accounting information? The roles of information awareness and acquisition costs. *Journal of Accounting Research* 57: 53–84.
- Blankespoor, E.; E. deHaan; and I. Marinovic. 2020. Disclosure processing costs, investors' information choice, and equity market outcomes: A review. *Journal of Accounting and Economics* 70: 101344.
- Breuer, M., and E. deHaan. 2024. Using and interpreting fixed effects models. *Journal of Accounting Research* 62: 1183–1226.
- Bucaro, A.C.; K.E. Jackson; and J.B. Lill. 2020. The influence of corporate social responsibility measures on investors' judgments when integrated in a financial report versus presented in a separate report. *Contemporary Accounting Research* 37: 665–695.
- Christensen, H.; L. Hail; and C. Leuz. 2021. Mandatory CSR and sustainability reporting: Economic analysis and literature review. *Review of Accounting Studies* 26: 1176–1248.
- deHaan, E.; J. Madsen; and J. Piotroski. 2017. Do weather-induced moods affect the processing of earnings news? *Journal of Accounting Research* 55: 509–550.
- deHaan, E.; T. Shevlin; and J. Thornock. 2015. Market (in)attention and the strategic scheduling and timing of earnings announcements. *Journal of Accounting and Economics* 60: 36–55.
- Demers, E.; J. Hendrikse; P. Joos; and B. Lev. 2021. ESG did not immunize stocks during the COVID-19 crisis, but investments in intangible assets did. *Journal of Business Finance and Accounting* 48: 433–462.
- Dhaliwal, D.; O. Li ; A. Tsang; and Y. Yang. 2011. Voluntary nonfinancial disclosure and the cost of equity capital: The initiation of corporate social responsibility reporting. *The Accounting Review* 86: 59–100.
- Drake, M.S.; D.T. Roulstone; and J.R. Thornock. 2015. The determinants and consequences of information acquisition via EDGAR. *Contemporary Accounting Research* 32: 1128–1161.
- Edmans, A. 2023. The end of ESG. *Financial Management* 52: 3–17.
- Fama, E., and K. French. 2007. Disagreement, tastes, and asset prices. *Journal of Financial Economics* 83: 667–689.
- Freeman, R., and S. Tse. 1989. The multiperiod information content of accounting earnings: Confirmations and contradictions of previous earnings reports. *Journal of Accounting Research* 27: 49–79.

- Friedman, H., and M. Heinle. 2016. Taste, information, and asset prices: Implications for the valuation of CSR. *Review of Accounting Studies* 21: 740–767.
- Friedman, H.; M. Heinle; and I. Luneva. 2024. Implications of introducing investor-focused ESG reporting. Working Paper. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4537743
- Glossner, S.; P. Matos; S. Ramelli; and A. Wagner. 2024. Do institutional investors stabilize equity markets in crisis periods? Evidence from COVID-19. Working Paper. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3655271
- Godfrey, P. C. 2005. The relationship between corporate philanthropy and shareholder wealth: A risk management perspective. *Academy of Management Review* 30: 777–798.
- Godfrey, P. C.; C.B. Merrill; and J.M. Hansen. 2009. The relationship between corporate social responsibility and shareholder value: An empirical test of the risk management hypothesis. *Strategic Management Journal* 30: 425–445.
- Goldstein, I.; A. Kopytov; L. Shen; and H. Xiang. 2024. On ESG investing: Heterogeneous preferences, information, and asset prices. Working Paper. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3823042
- Gonedes, N. 1978. Corporate signaling, external accounting, and capital market equilibrium: Evidence on dividends, income, and extraordinary items. *Journal of Accounting Research* 16: 26–79.
- Griffin, P., and Y. Sun. 2013. Going green: Market reaction to CSR newswire releases. *Journal of Accounting and Public Policy* 32: 93–113.
- Haley, S.; M. Shaffer; and R. Sloan. 2024. Do sustainability reports contain financially material information? Working Paper. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3976550
- Holthausen, R., and R. Verrecchia. 1988. The effect of sequential information releases on the variance of price changes in an intertemporal multi-asset market. *Journal of Accounting Research* 26: 82–106.
- Hoskin, R. E.; J.S. Hughes; and W.E. Ricks. 1986. Evidence on the incremental information content of additional firm disclosures made concurrently with earnings. *Journal of Accounting Research* 24: 1–32.
- Huang, A.; H. Wang; and Y. Yang. 2023. FinBERT: A large language model for extracting information from financial text. *Contemporary Accounting Research* 40: 806–841.
- Kane, A.; Y.K. Lee; and A. Marcus. 1984. Earnings and dividend announcements: Is there a corroboration effect? *Journal of Finance* 39: 1091–1099.
- Kim, S. 2024. Investor preferences and responses to disclosure: Evidence from carbon net-zero pledges. Working Paper. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4846045
- Krüger, P. 2015. Corporate goodness and shareholder wealth. *Journal of Financial Economics* 115: 304–329.

- Li, Q.; E. Watts; and C. Zhu. 2024. Retail investors and ESG news. *Journal of Accounting and Economics*: forthcoming.
- Lins, K.; H. Servaes; and A. Tamayo. 2017. Social capital, trust, and firm performance: The value of corporate social responsibility during the financial crisis. *Journal of Finance* 72: 1785–1824.
- Lys, T.; J. Naughton; and C. Wang. 2015. Signaling through corporate accountability reporting. *Journal of Accounting and Economics* 60: 56–72.
- Moss, A.; J. Naughton; and C. Wang. 2024. The irrelevance of Environmental, Social, and Governance disclosure to retail investors. *Management Science* 70: 2626–2644.
- Minor, D., and J. Morgan. 2011. CSR as reputation insurance: Primum non nocere. *California Management Review* 53: 40–59.
- Naughton, J.; C. Wang; and I. Yeung. 2019. Investor sentiment for corporate social performance. *The Accounting Review* 94: 401–420.
- Plumlee, M.; D. Brown; R.M. Hayes; and R.S. Marshall. 2015. Voluntary environmental disclosure quality and firm value: Further evidence. *Journal of Accounting and Public Policy* 34: 336–361.
- Serafeim, G., and A. Yoon. 2022. Which corporate ESG news does the market react to? *Financial Analyst Journal* 78: 59–78.
- Serafeim, G., and A. Yoon. 2023. Stock price reactions to ESG news: the role of ESG ratings and disagreement. *Review of Accounting Studies* 28: 1500–1530.
- Servaes H., and A. Tamayo. 2013. The impact of corporate social responsibility on firm value: The role of customer awareness. *Management Science* 59: 1045–1061.
- Sloan, R. 2024. Retail investors and ESG news: A discussion. *Journal of Accounting and Economics*: forthcoming.
- Thomas, J.; W. Yao; F. Zhang; and W. Zhu. 2022. Meet, beat, and pollute. *Review of Accounting Studies* 27: 1038–1078.

Appendix A: Variable Definitions

Variable	Description	Source
<i>Investor Reaction Variables:</i>		
<i>CAR</i>	Cumulative market-adjusted return during trading days [-1,1], multiplied by 100.	CRSP
<i>Turnover</i>	Average share turnover during trading days [-1,1], multiplied by 100. Share turnover equals the number of shares traded divided by the number of shares outstanding.	CRSP
<i>ESGQuestions</i>	The number of ESG sentences spoken by conference call participants (excluding management), scaled by the total number of sentences in the Q&A portion of the earnings conference call. ESG sentences are classified based on the fine-tuned FinBERT model, a state-of-the-art large language model for classifying financial texts developed by Huang et al., (2023). Because the BERT algorithm has a maximum limit of 512 tokens, we truncate sentences to 512 tokens if necessary. Huang et al. (2023) document that the FinBERT model achieved nearly 90% accuracy in the classification of ESG issues.	S&P
<i>EDGARDownloads</i>	Average number of 10-K and 10-Q human downloads from SEC EDGAR platform during trading days [-1,1].	EDGAR
<i>ESG News & Performance Variables:</i>		
<i>NegativeESG</i>	Indicator variable set to one if the change in the TVL Pulse score from the previous trading day is less than -5%.	Truvalue Labs
<i>PositiveESG</i>	Indicator variable set to one if the change in the TVL Pulse score from the previous trading day is greater than 5%.	Truvalue Labs
<i>NeutralESG</i>	Indicator variable set to one if the change in the TVL Pulse score from the previous trading day is greater than -5% (i.e., not <i>NegativeESG</i>) and less than 5% (i.e., not <i>PositiveESG</i>).	Truvalue Labs
<i>ESGScore</i>	Daily TVL Pulse score (scaled from zero to one).	Truvalue Labs
<i>Earnings News & Performance Type Variables:</i>		
<i>MissEst_{q-1}</i>	Indicator variable set to one if the firm missed its prior quarter's analysts' consensus EPS forecast.	I/B/E/S
<i>BeatEst_{q-1}</i>	Indicator variable set to one if the firm beat its prior quarter's analysts' consensus EPS forecast by more than one penny.	I/B/E/S
<i>AbsSurp</i>	The absolute value of earnings surprise, scaled by price in the prior ten trading days. Earnings surprise is the actual EPS from I/B/E/S minus	CRSP, I/B/E/S

Variable	Description	Source
	the consensus EPS forecast from I/B/E/S one month before the earnings announcement. Multiplied by 100.	
<i>AbsSurp_{q-1}</i>	The absolute value of earnings surprise at the prior earnings announcement, scaled by price in ten trading days before the earnings announcement. Earnings surprise is the actual EPS from I/B/E/S minus the consensus EPS forecast from I/B/E/S one month before the earnings announcement. Multiplied by 100.	CRSP, I/B/E/S
<i>Other Variables:</i>		
<i>Size</i>	The natural log of the market value of equity (PRCCQ* CSHOQ).	Compustat
<i>M/B</i>	Market-to-book ratio calculated as (PRCCQ*CSHOQ)/CEQQ.	Compustat
<i>Leverage</i>	Total debt (DLCQ + DLTTQ) divided by total assets (ATQ).	Compustat
<i>SalesGrowth</i>	The percentage change in sales (SALEQ) over the previous quarter.	Compustat
<i>Analysts</i>	The natural log of one plus the number of analysts following the firm over the previous 45 days.	I/B/E/S
<i>RetVol</i>	The standard deviation of daily returns over the three prior months.	CRSP
<i>InstOwn</i>	The percentage of shares outstanding held by institutional investors.	Thomson Reuters
<i>EarnPersist</i>	The coefficient of a firm-specific OLS regression of current earnings per share on the prior year's earnings per share in the same quarter, calculated over trailing four years.	Compustat
<i>ReportLag</i>	The number of days between fiscal-quarter end and the earnings announcement date.	Compustat
<i>Loss</i>	Indicator variable set to one if the earnings before extraordinary items (IBQ) is negative.	Compustat

All accounting and market variables are measured as at or over the prior fiscal quarter unless otherwise noted. Continuous variables are winsorized at the top and bottom one percent.

Appendix B: Major ESG News Event Examples

Panel A: ESG News Concurrent With Earnings Announcement



BREAKINGVIEWS

FEBRUARY 25, 2015 / 11:42 AM / UPDATED 8 YEARS AGO

Lumber Liquidators says may face criminal charges from DoJ

(Reuters) - Lumber Liquidators Holdings Inc, a retailer of hardwood flooring in North America, said the U.S. Department of Justice may seek criminal charges against the company under an Act aimed at curbing illegal harvest of tropical hardwoods.



STOCKS

Lumber Liquidators sinks, says bad press coming

PUBLISHED WED, FEB 25 2015-5:00 PM EST | UPDATED WED, FEB 25 2015-5:01 PM EST

Shares of [Lumber Liquidators](#) fell more than 26 percent Wednesday after the company reported a big earnings miss and hinted at more negative news in the future.

During the firm's earnings conference call, management warned investors that an upcoming "60 Minutes" episode will be negative for the company.

"We now believe the news program '60 Minutes' will feature our company in an unfavorable light with regard to our sourcing and product quality, specifically relating to laminates," Rob Lynch, the company's president and CEO said on the call.

(A1) Lumber Liquidators faces charges over unsafe laminate flooring



REUTERS.COM SERVICE 3 MOLT

FEBRUARY 3, 2009 / 8:50 AM / UPDATED 14 YEARS AGO



Marathon says Detroit upgrade start delayed to 2012

By Haitham Haddadin

3 MIN READ



NEW YORK (Reuters) - Marathon Oil Corp MRO.N said Tuesday the completion of its 100,000 barrel-per-day Detroit refinery upgrade will be delayed to mid-2012 as the company announced spending cuts for this year.

Marathon -- which posted a fourth-quarter net loss and announced cuts to total 2009 spending -- said its refining, marketing and transportation spending is expected to total \$1.9 billion for this year, down from \$2.9 billion in 2008.

(A2) Marathon Oil delays capacity increase at oil refinery



The New York Times

Monster Energy Drink Cited in Deaths

By [Barry Meier](#)

Oct. 22, 2012

Five people may have died over the past three years after drinking Monster Energy, a popular energy drink that is high in caffeine, according to incident reports recently released by the Food and Drug Administration.

COMMODITIES (OLD) OCTOBER 22, 2012 / 5:20 PM / UPDATED 10 YEARS AGO

 **REUTERS U.S. probes deaths for links to Monster energy drink**

(B1) Monster Beverages energy drinks linked to deaths

TIFFANY & CO.

Bloomberg

Tiffany & Co. Leads New Era of Diamond Transparency

January 9, 2019 at 6:00 AM MST

Tiffany & Co. Leads New Era of Diamond Transparency

Tiffany Begins Disclosing the Provenance of its Diamonds, Commits to 100% Geographic Transparency

Business Wire

NEW YORK -- January 9, 2019

Tiffany & Co. announced today that it will begin sharing with consumers the provenance (region or countries of origin) of its newly sourced, individually registered diamonds – a significant step for diamond transparency – and by 2020, their craftsmanship journey – an industry first.

 Human Rights Watch
@hrw

Tiffany and Co. Announces New Diamond Transparency

Transparency is the first step to improve human rights in a supply chain.
[ow.ly/9TOJ30nfFo2](https://www.nytimes.com/2019/01/09/business/tiffany-diamond-transparency.html)



12:34 PM · Jan 9, 2019

(B2) Tiffany & Co. announces initiative to share origins of its diamonds

Appendix B presents select ESG events from our sample. Panel A includes two ESG events that occurred concurrently with an earnings announcement: (A1) shows a negative ESG event in which Lumber Liquidators is under Department of Justice (DOJ) investigation for their sourcing of materials used in their laminate floors and (A2) shows a positive ESG event in which Marathon Oil delays increasing production at one of their oil refineries. Panel B includes two ESG events that did not occur concurrently with an earnings announcement: (B1) shows a negative ESG event in which Monster Beverages is being investigated because their energy drinks were linked to several deaths and (B2) shows a positive ESG event in which Tiffany & Co. announces an initiative to share the origins of its diamonds.

Table 1: Sample Formation and Composition*Panel A: Initial Sample Screening*

<i>Sample Selection Criteria</i>	<i># of Days</i>	<i># of Firms</i>
TVL Sample (2009 – 2019)	18,707,516	
Matched to CRSP/Compustat	9,947,874	5,409
Other data filters	7,120,398	4,446
All requisite regression variables	5,529,851	3,712
Maximum Number of Days with Requisite Data	5,529,851	3,712

Panel B: Sample Formation

	EA Days (1)	Non-EA Days (2)	ESG News Days (3)
Negative ESG News (% Δ ESGScore < -5%)	2,125	90,782	90,782
Neutral ESG News			
-5% < % Δ ESGScore < 0	1,997	105,253	105,253
% Δ ESGScore = 0	81,996	5,045,507	-
0 < % Δ ESGScore < 5%	1,988	105,881	105,881
Positive ESG News (% Δ ESGScore > 5%)	<u>2,002</u>	<u>92,320</u>	<u>92,320</u>
Total	90,108	5,439,743	394,236

Panel C: Sample Composition by Year

<i>Year</i>	<i>Firm Years</i>		<i>Firm Days</i>	
	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>
2009	1,797	7.2	27,321	5.6
2010	2,050	8.2	32,996	6.8
2011	2,087	8.4	37,387	7.7
2012	2,151	8.7	39,834	8.2
2013	2,234	9.0	43,123	8.9
2014	2,347	9.4	54,886	11.3
2015	2,415	9.7	62,176	12.8
2016	2,425	9.8	38,105	7.9
2017	2,474	10.0	43,715	9.0
2018	2,461	9.9	45,841	9.5
2019	2,411	9.7	58,960	12.2
Total	24,852	100.0%	484,344	100.0%

(Continued)

Table 1 (Continued)*Panel D: Sample Composition by Industry (1-digit SIC)*

<i>SIC1</i>	<i>Industry Description</i>	<i>Firms</i>		<i>Firm Days</i>	
		<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>
0	Agriculture, Forestry, and Fisheries	7	0.2	2,038	0.4
1	Mineral and Construction	211	5.7	20,751	4.3
2	Manufacturing	698	18.9	84,718	17.5
3	Manufacturing	875	23.6	103,400	21.3
4	Transportation, Communications, and Utilities	288	7.8	70,169	14.5
5	Whole Trade and Retail Trade	325	8.8	54,359	11.2
6	Finance, Insurance and Real Estate	624	16.9	67,363	13.9
7	Service Industries	508	13.8	65,561	13.5
8	Service Industries	152	4.1	12,393	2.6
9	Public	2	0.1	3,592	0.7
Total		3,690	100.0%	484,344	100.0%

The table presents the sample formation and composition. Panel A lists the sample selection criteria based on TVL and other requisite data. Panel B presents the sample formation for EA days and ESG news days based on the TVL score change. The final sample contains 484,344 firm-days from January 2009 to December 2019. Panel C (D) presents the number of firms and firm-days for our sample by year (one-digit standard industry classification code or SIC1). Percentages may not add to 100 due to rounding.

Table 2: Descriptive Statistics

	<i>N</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>P25</i>	<i>Median</i>	<i>P75</i>
<i>Investor Reaction Variables:</i>						
CAR	484,344	0.048	4.184	-1.505	0.008	1.561
Turnover	484,344	1.173	1.276	0.478	0.762	1.323
ESGQuestions	68,146	1.367	1.222	0.478	1.096	1.948
<i>ESG News & Performance Type Variables:</i>						
NegativeESG (Indicator)	484,344	0.192	0.394			
PositiveESG (Indicator)	484,344	0.195	0.396			
ESGScore	484,344	0.528	0.164	0.429	0.521	0.628
<i>Earnings News & Performance Type Variables:</i>						
MissEst _{q-1} (Indicator)	484,344	0.282	0.450			
BeatEst _{q-1} (Indicator)	484,344	0.624	0.484			
AbsSurp	484,344	0.004	0.010	0	0.001	0.003
AbsSurp _{q-1}	484,344	0.004	0.010	0	0.001	0.003
<i>Other Variables:</i>						
Size	484,344	9.124	2.072	7.651	9.285	10.702
M/B	484,344	3.795	7.498	1.405	2.420	4.366
Leverage	484,344	0.271	0.195	0.125	0.253	0.380
SalesGrowth	484,344	0.026	0.177	-0.041	0.014	0.074
Analysts	484,344	2.695	0.716	2.303	2.890	3.219
RetVol	484,344	2.032	1.193	1.241	1.689	2.418
InstOwn	484,344	73.092	22.031	64.535	77.280	88.566
EarnPersist	484,344	0.210	0.488	-0.068	0.135	0.474
ReportLag	484,344	29.507	9.902	23	29	35
Loss (Indicator)	484,344	0.176	0.381			

The table presents descriptive statistics for variables used in our analyses. Definitions for each variable can be found in Appendix A.

Table 3: Distribution and Investor Reactions by EA Days and Non-EA Days

	EA Days (1)	Non-EA Days (2)	<i>p</i> -value (EA Days = Non-EA Days) (3)
N	90,108	5,439,743	
% Δ ESGScore	0.562	0.664	[0.788]
Abs% Δ ESGScore	1.676	1.419	[0.501]
NegativeESG (% Δ ESGScore < -5%)			
Count	2,125	90,782	
% of Days	0.024	0.017	[0.000]
CAR	-0.205	0.006	[0.008]
Turnover	2.238	1.153	[0.000]
PositiveESG (% Δ ESGScore > 5%)			
Count	2,002	92,320	
% of Days	0.022	0.017	[0.000]
CAR	0.137	0.061	[0.341]
Turnover	2.030	1.125	[0.000]

The table presents the means of % Δ ESGScore (*Abs% Δ ESGScore*), the daily percentage change (daily absolute percentage change) in a firm's TVL ESG Pulse score, the count of *NegativeESG* (*PositiveESG*) Days, and the % of *NegativeESG* (*PositiveESG*) Days, and the investor reaction variables by earnings announcements days (EA days), and non-earnings announcements days (Non-EA Days). The table also reports *p*-values from *t*-tests comparing the equality of means across EA Days and Non-EA Days.

Table 4: Investor Reaction to Earnings and ESG News on Earnings Announcement Days

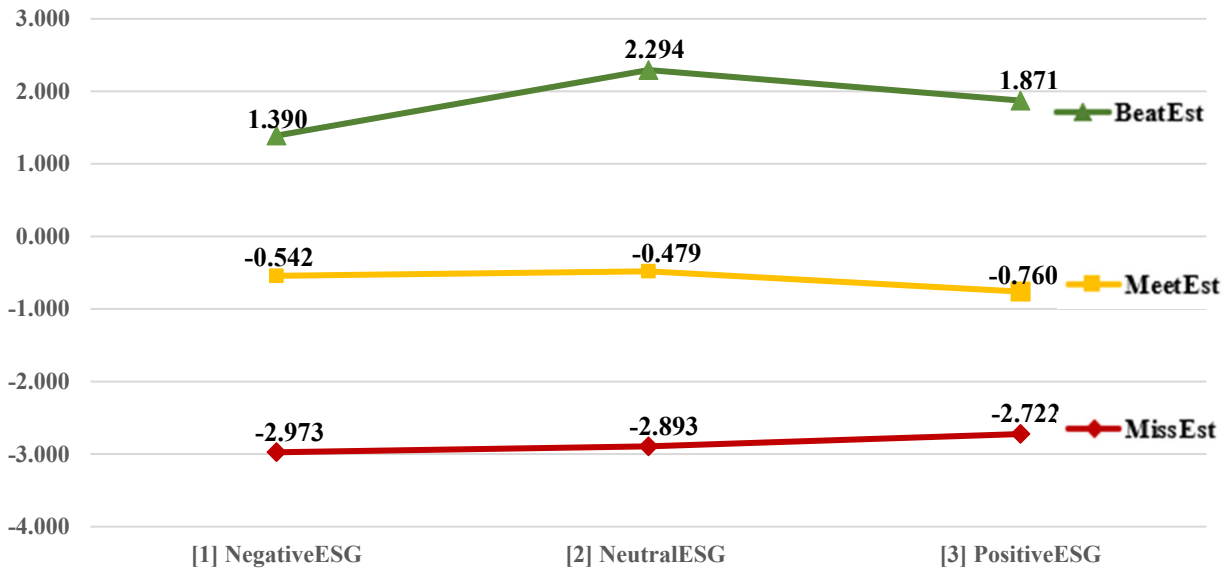
Panel A: Number of Observations

		EA News			(4) Overall
		(1) MissEst	(2) MeetEst	(3) BeatEst	
ESG News	[1] NegativeESG	622	350	1,153	2,125
	[2] NeutralESG	28,436	14,272	43,273	85,981
	[3] PositiveESG	585	298	1,119	2,002
	[4] Overall	29,643	14,920	45,545	90,108

Panel B: CAR

		EA News			(4) Overall
		(1) MissEst	(2) MeetEst	(3) BeatEst	
ESG News	[1] NegativeESG	-2.973	-0.542	1.390	-0.205
	[2] NeutralESG	-2.893	-0.479	2.294	0.118
	[3] PositiveESG	-2.722	-0.760	1.871	0.137
	[4] Overall	-2.891	-0.486	2.260	0.111
	<i>p</i> -value: [1] = [2]	0.778	0.857	0.000	0.042
	<i>p</i> -value: [2] = [3]	0.561	0.455	0.042	0.908
	<i>p</i> -value: [1] = [3]	0.554	0.654	0.089	0.123

Panel C: Graphic Illustration of CAR



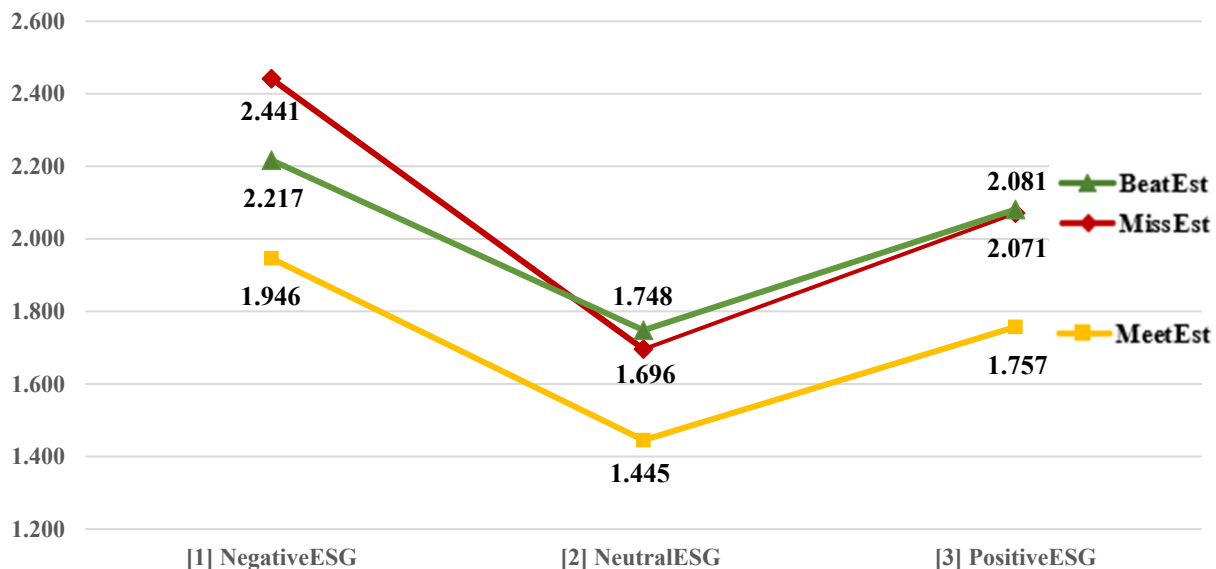
(Continued)

Table 4 (Continued)

Panel D: Turnover

		EA News			(4) Overall
		(1) MissEst	(2) MeetEst	(3) BeatEst	
ESG News	[1] NegativeESG	2.441	1.946	2.217	2.238
	[2] NeutralESG	1.696	1.445	1.748	1.681
	[3] PositiveESG	2.071	1.757	2.081	2.030
	[4] Overall	1.719	1.463	1.768	1.702
<i>p</i> -value: [1] = [2]		0.000	0.000	0.000	0.000
<i>p</i> -value: [2] = [3]		0.000	0.000	0.000	0.000
<i>p</i> -value: [1] = [3]		0.002	0.144	0.094	0.001

Panel E: Graphic Illustration of Turnover



The table presents univariate comparisons of the market reaction variables for the sample of earnings announcement days partitioned by the direction of earnings news (column variables) and the direction of ESG news [row variables]. The sample in column (1) consists of earnings announcement days where firms missed the analysts' consensus forecast (*MissEst*). The sample in column (2) consists of earnings announcement days where firms met or beat the analyst consensus forecast by no more than one penny (*MeetEst*). The sample in column (3) consists of earnings announcement days where firms beat the analyst consensus forecast by more than one penny (*BeatEst*). The sample in row [1] consists of days where the change in the TVL Pulse score over the previous trading day is less than negative five percent (*NegativeESG*). The sample in row [2] consists of days where the change in the TVL Pulse score over the previous trading day is between negative five percent and five percent (*NeutralESG*). The sample in row [3] consists of days where the change in the TVL Pulse score over the previous trading day is greater than five percent (*PositiveESG*). Panel A reports the number of observations in each partition. Panel B reports the mean value of *CAR* in each partition. *CAR* is the cumulative market-adjusted return during trading days [-1,1], multiplied by 100. Panel D reports the mean value of *Turnover* in each partition. *Turnover* is the average share turnover during trading days [-1,1], multiplied by 100. Share turnover equals the number of shares traded divided by the number of shares outstanding. Panels B and C also report *p*-values from *t*-tests comparing the equality of means. Panels C and E provide graphic illustrations for Panels B and D, respectively.

Table 5: Regression Analysis of Investor Reaction to Earnings and ESG News on EA Days

	EANews <i>MissEst</i>	EANews <i>MeetEst</i>	EANews <i>BeatEst</i>	EANews <i>MissEst</i>	EANews <i>MeetEst</i>	EANews <i>BeatEst</i>
Dependent Variables:	(1) <i>CAR</i>	(2) <i>CAR</i>	(3) <i>CAR</i>	(4) <i>Turnover</i>	(5) <i>Turnover</i>	(6) <i>Turnover</i>
(1) NegativeESG	-0.297 (-0.92)	-0.218 (-0.58)	-0.390* (-1.83)	0.240*** (3.47)	0.135** (2.08)	0.190*** (4.77)
(2) PositiveESG	0.055 (0.18)	-0.312 (-0.75)	0.080 (0.38)	0.099* (1.82)	0.065 (0.88)	0.080** (2.36)
<i>p</i> -value: (1) = (2)	[0.417]	[0.865]	[0.105]	[0.092]	[0.454]	[0.029]
AbsSurp	-48.217*** (-9.87)	472.265*** (5.59)	64.088*** (10.50)	6.049*** (6.73)	-44.042*** (-4.29)	6.257*** (4.69)
ESGScore	-0.173 (-0.69)	-0.524 (-1.50)	0.012 (0.06)	-0.052 (-1.17)	-0.090* (-1.79)	-0.075** (-2.17)
Size	-1.847*** (-12.85)	-1.910*** (-9.10)	-1.968*** (-16.30)	0.288*** (8.41)	0.240*** (5.58)	0.094*** (2.87)
M/B	-0.002 (-0.25)	0.008 (0.65)	-0.003 (-0.39)	0.000 (0.19)	-0.000 (-0.13)	0.001 (0.43)
Leverage	-2.357*** (-4.47)	-0.737 (-0.90)	-0.728* (-1.71)	0.877*** (6.31)	0.342** (2.27)	0.537*** (4.89)
SalesGrowth	1.931*** (8.32)	3.077*** (7.19)	2.341*** (10.90)	-0.013 (-0.33)	0.028 (0.46)	0.206*** (6.18)
Analysts	-0.216 (-1.06)	0.367 (1.14)	0.483*** (2.78)	0.426*** (9.53)	0.311*** (6.36)	0.354*** (8.49)
RetVol	0.245*** (3.56)	0.163 (1.46)	-0.087 (-1.43)	0.312*** (20.38)	0.286*** (14.09)	0.354*** (22.89)
InstOwn	0.004 (0.97)	0.010 (1.54)	0.003 (0.91)	0.007*** (6.98)	0.006*** (4.66)	0.007*** (7.13)
EarnPersist	0.216* (1.87)	-0.073 (-0.45)	-0.188* (-1.85)	-0.014 (-0.52)	0.002 (0.06)	0.014 (0.69)
ReportLag	0.027** (2.35)	0.005 (0.30)	-0.026*** (-2.70)	0.000 (0.05)	0.001 (0.51)	0.003 (1.51)
Loss	-0.890*** (-6.18)	-0.734*** (-2.67)	-1.715*** (-12.31)	-0.018 (-0.69)	-0.037 (-0.95)	-0.091*** (-3.22)
Firm and Date FE	Included	Included	Included	Included	Included	Included
Adj. R2	0.099	0.075	0.098	0.593	0.632	0.642
N	28,910	13,788	44,949	28,910	13,788	44,949

The table reports the investor reaction to earnings and ESG news on earnings announcement days partitioned by the direction of earnings news. The sample in columns (1) and (4) consists of earnings announcement days where firms missed the analysts' consensus forecast (*MissEst*). The sample in columns (2) and (5) consists of the subsample of earnings announcement days where firms met or beat the analysts' consensus forecast by no more than one penny (*MeetEst*). The sample in columns (3) and (6) consists of earnings announcement days where firms beat the analysts' consensus forecast by more than one penny (*BeatEst*). The table reports the results of OLS estimation where the dependent variables are *CAR* and *Turnover* and the independent variables include ESG news and control variables. *NegativeESG* is an indicator set to one if the change in the TVL Pulse score over the previous trading day is less than negative five percent. *PositiveESG* is an indicator set to one if the change in the TVL Pulse score over the previous trading day is greater than five percent. All other variables are defined in Appendix A. The *t*-statistics (in parentheses) are based on robust standard errors clustered by firm and date. The table also reports *p*-values from *F*-tests comparing the equality of coefficients. We include firm fixed effects and date fixed effects, but do not report the coefficients. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% *p*-levels (two-tailed), respectively.

Table 6: ESG Questions on Earnings Conference Call

Dependent Variables:	(1)	(2)
	<i>ESGQuestions</i>	<i>ESGQuestions</i>
(1) MissEst	-0.027* (-1.96)	-0.020** (-2.03)
(2) BeatEst	-0.010 (-0.78)	
<i>p</i> -value: (1) = (2)	[0.088]	
AbsSurp	1.428** (2.00)	1.353* (1.92)
ESGScore	0.040** (2.58)	0.039** (2.55)
Size	0.000 (0.28)	0.000 (0.30)
M/B	-0.062 (-1.08)	-0.062 (-1.08)
Leverage	-0.000 (-1.28)	-0.000 (-1.28)
SalesGrowth	0.098*** (3.38)	0.099*** (3.39)
Analysts	0.001 (0.24)	0.001 (0.23)
RetVol	0.000 (0.73)	0.000 (0.73)
InstOwn	0.004 (1.00)	0.004 (1.01)
EarnPersist	-0.001 (-1.60)	-0.001 (-1.60)
ReportLag	0.025* (1.81)	0.026* (1.84)
Loss	-0.890*** (-6.18)	-0.020** (-2.03)
Firm and Date FE	Included	Included
Adj. R2	0.296	0.296
N	67,823	67,823

The table reports the results of OLS estimation where the dependent variable is *ESGQuestions* and the independent variables include the direction of earnings news and control variables. *ESGQuestions* is the number of ESG sentences spoken by conference call participants (excluding management), scaled by the total number of sentences in the Q&A portion of the earnings conference call. ESG sentences are classified by the fine-tuned FinBERT model in Huang et al. (2023). *MissEst* is an indicator set to one if the firm missed consensus forecast. *BeatEst* is an indicator set to one if the firm beat its analysts' consensus forecast by more than one penny. All other variables are defined in Appendix A. The *t*-statistics (in parentheses) are based on robust standard errors clustered by firm and date. The table also reports *p*-values from *F*-tests comparing the equality of coefficients. We include firm fixed effects and date fixed effects, but do not report the coefficients. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% *p*-levels (two-tailed), respectively.

Table 7: Investor Reaction to Earnings and ESG News on ESG News Days

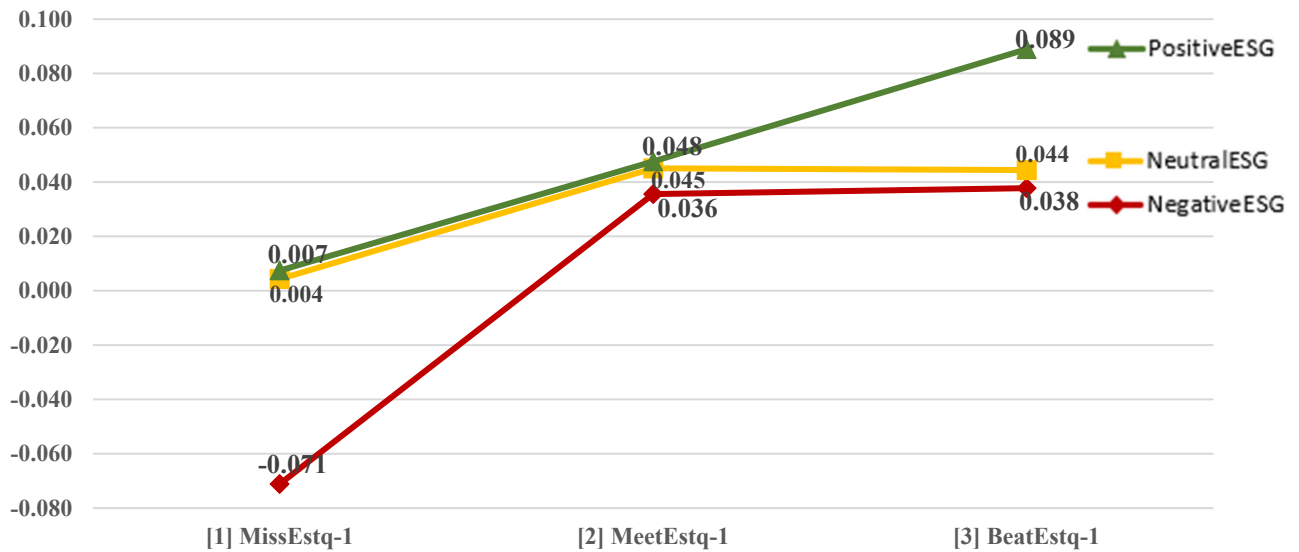
Panel A: Number of Observations

		ESG News			(4) Overall
		(1) NegativeESG	(2) NeutralESG	(3) PositiveESG	
EA News	[1] MissEst _{q-1}	26,277	54,031	26,722	107,030
	[2] MeetEst _{q-1}	8,704	18,307	8,755	35,766
	[3] BeatEst _{q-1}	55,801	138,796	56,843	251,440
	[4] Overall	90,782	211,134	92,320	394,236

Panel B: CAR

		ESG News			(4) Overall
		(1) NegativeESG	(2) NeutralESG	(3) PositiveESG	
EA News	[1] MissEst _{q-1}	-0.071	0.004	0.007	-0.013
	[2] MeetEst _{q-1}	0.036	0.045	0.048	0.043
	[3] BeatEst _{q-1}	0.038	0.044	0.089	0.053
	[4] Overall	0.006	0.034	0.061	0.034
	<i>p</i> -value: [1] = [2]	0.027	0.123	0.394	0.008
	<i>p</i> -value: [2] = [3]	0.953	0.973	0.252	0.552
	<i>p</i> -value: [1] = [3]	0.000	0.004	0.001	0.000

Panel C: Graphic Illustration of CAR



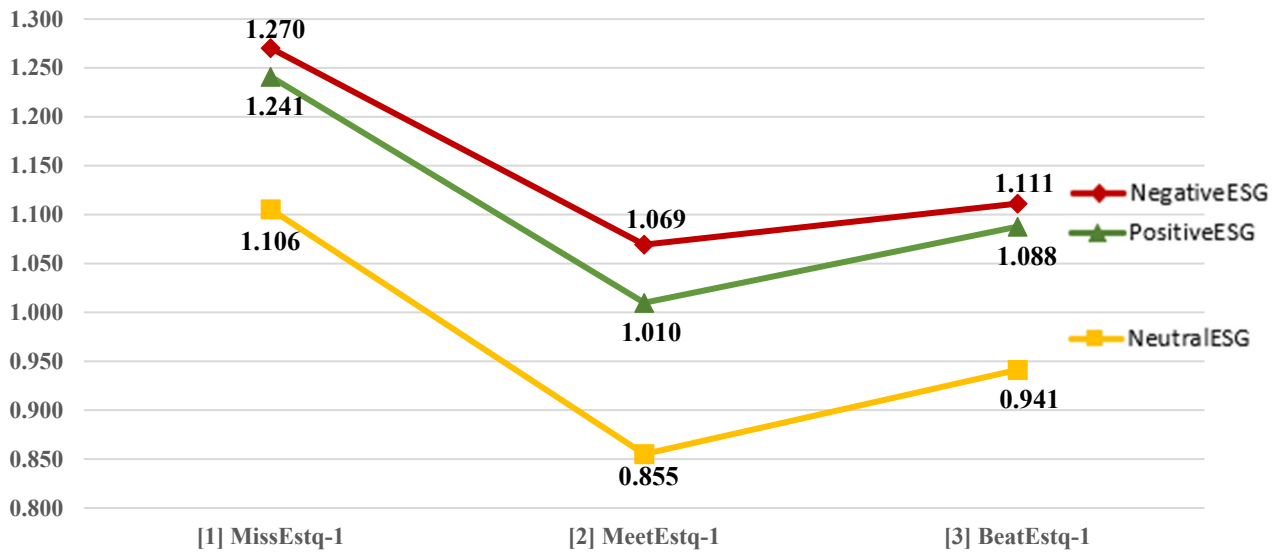
(Continued)

Table 7 (Continued)

Panel D: Turnover

		ESG News			(4) Overall
		(1) NegativeESG	(2) NeutralESG	(3) PositiveESG	
EA News	[1] MissEst _{q-1}	1.270	1.106	1.241	1.180
	[2] MeetEst _{q-1}	1.069	0.855	1.010	0.945
	[3] BeatEst _{q-1}	1.111	0.941	1.088	1.012
[4] Overall		1.153	0.976	1.125	1.052
<i>p</i> -value: [1] = [2]		0.000	0.000	0.000	0.000
<i>p</i> -value: [2] = [3]		0.002	0.000	0.000	0.000
<i>p</i> -value: [1] = [3]		0.000	0.000	0.000	0.000

Panel E: Graphic Illustration of Turnover



The table presents univariate comparisons of the market reaction variables for the sample of non-earnings announcement days where the change in a firm’s TVL ESG Pulse score is non-zero (ESG news days) partitioned by the direction and magnitude of ESG news (column variables) and the direction of most current earnings news [row variables]. The sample in column (1) consists of days where the change in the TVL Pulse score over the previous trading day is less than negative five percent (*NegativeESG*). The sample in column (2) consists of days where the change in the TVL Pulse score over the previous trading day is between negative five percent and five percent (*NeutralESG*). The sample in column (3) consists of days where the change in the TVL Pulse score over the previous trading day is greater than five percent (*PositiveESG*). The sample in row [1] consists of days where firms missed the prior quarter’s analysts’ consensus forecast (*MissEst_{q-1}*). The sample in row [2] consists of days where firms met or beat the prior quarter’s analysts’ consensus forecast by no more than one penny (*MeetEst_{q-1}*). The sample in row [3] consists of days where firms beat the prior quarter’s analysts’ consensus forecast by more than one penny (*BeaEst_{q-1}*). Panel A reports the number of observations in each partition. Panel B reports the mean value of *CAR* in each partition. *CAR* is the cumulative market-adjusted return during trading days [-1,1], multiplied by 100. Panel C reports the mean value of *Turnover* in each partition. *Turnover* is the average share turnover during trading days [-1,1], multiplied by 100. Share turnover equals the number of shares traded divided by the number of shares outstanding. Panels B and C also report *p*-values from *t*-tests comparing the equality of means. Panels C and E provide graphic illustrations for Panels B and D, respectively.

Table 8: Regression Analysis of Investor Reaction to Earnings and ESG News on ESG News Days

	<i>Negative ESG</i>	<i>Neutral ESG</i>	<i>Positive ESG</i>	<i>Negative ESG</i>	<i>Neutral ESG</i>	<i>Positive ESG</i>
Dependent	(1)	(2)	(3)	(4)	(5)	(6)
Variables:	<i>CAR</i>	<i>CAR</i>	<i>CAR</i>	<i>Turnover</i>	<i>Turnover</i>	<i>Turnover</i>
(1) <i>MissEst_{q-1}</i>	-0.046 (-0.89)	-0.029 (-0.95)	-0.024 (-0.49)	0.015 (0.86)	-0.006 (-0.26)	0.018 (1.21)
(2) <i>BeatEst_{q-1}</i>	0.051 (1.13)	0.006 (0.24)	0.055 (1.27)	-0.026* (-1.70)	-0.018 (-1.18)	-0.016 (-1.22)
<i>p</i> -value: (1) = (2)	[0.004]	[0.117]	[0.017]	[0.000]	[0.369]	[0.002]
<i>AbsSurp_{q-1}</i>	-2.499 (-0.78)	0.517 (0.20)	0.406 (0.14)	2.358* (1.84)	11.972*** (3.85)	3.056** (2.40)
<i>ESGScore</i>	0.339*** (3.51)	0.154 (1.46)	0.176* (1.94)	-0.012 (-0.39)	-0.146** (-2.17)	-0.211*** (-7.49)
<i>Size</i>	-0.306*** (-5.58)	-0.295*** (-5.46)	-0.362*** (-6.35)	-0.031 (-1.00)	-0.163** (-2.44)	-0.043 (-1.31)
<i>M/B</i>	0.001 (0.24)	0.001 (1.30)	-0.000 (-0.20)	0.001 (0.68)	0.001 (0.81)	0.001 (0.75)
<i>Leverage</i>	-0.291 (-1.32)	0.087 (0.52)	-0.275 (-1.34)	0.326*** (3.03)	0.163 (0.98)	0.364*** (3.41)
<i>SalesGrowth</i>	-0.024 (-0.27)	0.054 (0.72)	0.028 (0.32)	0.052* (1.84)	0.055 (1.53)	0.046* (1.66)
<i>Analysts</i>	-0.061 (-0.77)	-0.040 (-0.69)	0.032 (0.41)	0.084* (1.83)	-0.085 (-1.04)	0.062 (1.33)
<i>RetVol</i>	0.047 (1.44)	0.067** (2.05)	0.022 (0.65)	0.278*** (17.27)	0.344*** (10.03)	0.288*** (17.57)
<i>InstOwn</i>	0.002 (1.22)	0.002* (1.90)	0.001 (1.03)	0.002** (2.39)	0.001 (0.92)	0.002** (2.24)
<i>EarnPersist</i>	-0.023 (-0.55)	0.030 (1.16)	0.087** (2.17)	0.014 (0.84)	0.004 (0.14)	0.018 (1.01)
<i>ReportLag</i>	0.004* (1.66)	0.000 (0.20)	0.002 (0.89)	0.003*** (2.78)	-0.000 (-0.24)	0.002** (2.35)
<i>Loss</i>	-0.026 (-0.48)	-0.135*** (-3.19)	-0.145*** (-3.04)	0.078*** (3.79)	0.048** (1.96)	0.065*** (3.21)
Firm and Date FE	Included	Included	Included	Included	Included	Included
Adj. R2	0.056	0.030	0.051	0.483	0.629	0.516
N	90,447	210,722	91,960	90,447	210,722	91,960

The table reports the investor reaction to earnings news on ESG news days partitioned by the direction and magnitude of ESG news. ESG news days include non-earnings announcement days where the change in a firm's TVL ESG Pulse score is non-zero. The sample in columns (1) and (4) consists of days where the change in the TVL Pulse score over the previous trading day is less than negative five percent (*NegativeESG*). The sample in columns (2) and (5) consists of days where the change in the TVL Pulse score over the previous trading day is between negative five percent and five percent (*NeutralESG*). The sample in columns (3) and (6) consists of days where the change in the TVL Pulse score over the previous trading day is greater than five percent (*PositiveESG*). The table reports the results of OLS estimation where the dependent variables are *CAR* and *Turnover* and the independent variables include the most current earnings news and control variables. *MissEst_{q-1}* is an indicator set to one if the firm missed its prior quarter's analysts' consensus forecast. *BeatEst_{q-1}* is an indicator set to one if the firm beat its prior quarter's analysts' consensus forecast by more than one penny. All other variables are defined in Appendix A. The *t*-statistics (in parentheses) are based on robust standard errors clustered by firm and date. The table also reports *p*-values from *F*-tests comparing the equality of coefficients. We include firm fixed effects and date fixed effects, but do not report the coefficients. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% *p*-levels (two-tailed), respectively.

Table 9: Number of EDGAR Downloads by Types of ESG News Days

Type of Days	# of Days	# of Downloads
NegativeESG	67,693	111
NeutralESG	154,268	358
PositiveESG	69,089	112

The table presents the mean number of human 10-K and 10-Q downloads from the SEC EDGAR website for the three days centered on our sample of ESG news days classified by the percentage change in a firm's TVL ESG Pulse score. We classify human downloads based on Drake, Roulstone, and Thornock (2015).