Bigger Fish to Fry: The Interdependence of Earnings and ESG News in Investor Screening

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Abstract

We examine how investors respond to the combination of financial and ESG news and the implications of their response for investors' portfolio selections. Our analyses show that earnings news strongly impacts investors' reaction to ESG news. There is a differential investor pricing response to salient ESG news when earnings news is positive, but none when earnings news is negative. This latter result suggests that investors do not incorporate even the most salient ESG news when earnings news is negative. In addition, the investor response to salient ESG news outside of the earnings announcement period varies based on the most current earnings news, implying that earnings performance plays a critical role in the evaluation of subsequent ESG news. Collectively, our results highlight a number of potential shortcomings associated with empirical tests that analyze ESG news without considering earnings news, and contribute to a more complete understanding of the joint importance of financial and ESG performance news in evaluating investment decisions.

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1. Introduction

We examine how investors respond to the combination of financial and ESG news and the implications of their response for investor screening. Within the ESG literature, there are studies that examine how firms' historical ESG performance influences capital market measures such as earnings informativeness (e.g., Cheng and Wahid, 2017; Berkovitch, Israeli, Rakshit and Sridharan, 2022) and how investors respond to ESG news releases (e.g., Serafeim and Yoon, 2022a,b; Burzillo, Shaffer, and Sloan, 2022; Moss, Naughton, and Wang, 2023). However, neither of these two areas of literature has considered how investors respond to concurrent financial and ESG news. In the first area, the investor response to earnings news is conditioned on historical ESG performance rather than newly provided ESG news. In the second area, studies have generally examined the investor response to ESG news by isolating events that are separate from financial events (e.g., outside earnings announcements periods). While this research design choice allows for clean inferences on the effect of stand-alone ESG news, it limits our understanding of how investors respond to simultaneously provided financial and ESG performance information.

We propose that the concurrent processing of financial and ESG news by investors warrants additional examination for two reasons. First, the investor response to ESG news that is separate from financial news does not provide a complete picture of how investors process ESG news, especially in the context of the practitioner view that ESG performance is a supplement rather than a substitute for financial performance.[1] For example, it is possible that ESG and financial news are interdependent, such that the former has implications for the interpretation of

[1] For example, in a recent 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

the latter. Second, the concurrent examination of financial and ESG news may also provide insights into how investors screen across these dimensions. In general, screening is a process through which certain attributes are used to either include or exclude potential investments (e.g., tobacco companies). As part of the screening process, investors typically order their preferences according to desired attributes. For example, investors may use a positive screen to identify the acceptable set of firms with strong financial performance and then take the subsequent step of selecting specific investments based on ESG performance within that group.

Our interest in investor screening informs two facets of our research design. First, our tests filter on one attribute (e.g., earnings news) by using subsamples, and then we investigate how the investor response varies based on the second attribute (e.g., ESG news) within each subsample. Second, since screening involves the differential inclusion and exclusion of firms based on "good" and "bad" attributes, our analyses focus on the differential response based on whether the earnings or ESG news is positive, other, or negative. In general, our conclusions are supported by differences in coefficients across groupings rather than on single coefficient estimates for an individual grouping.

We use two distinct research settings, one where financial news is the first screen and another where ESG news is the first screen, to provide more robust inferences. We use earnings announcements to identify days where financial news is the most salient and data from Truvalue Labs (TVL) to identify days where ESG news is the most salient.[2] Our analyses measure the investor response using three short window market reaction variables commonly used in the literature: signed and absolute cumulative abnormal returns and share turnover. Broadly, these variables allow us to identify two distinct aspects of investor response. Cumulative abnormal

[2] The Truvalue Labs (TVL) data is described in detail in Section 3.1.

return captures pricing implications (i.e., there was a change in the consensus view of the value of the firm), whereas absolute cumulative abnormal returns and share turnover capture the information content of the news (i.e., there was trading due to investors updating their prior assessment of the firm or disagreement among investors in their interpretation of the news).

Our first set of empirical analyses investigates the investor response to ESG news conditional on earnings news. We find that this response is heavily dependent on earnings news. There is no detectable difference in the investor response to different types of ESG news when earnings news is negative. In colloquial terms, this result implies that investors do not consider the pricing impact of new ESG news when they have 'bigger fish to fry' with negative earnings news. In contrast, there are statistically different pricing responses to ESG news when earnings news is positive. However, the differences in returns are not simply linear functions of the level of positivity in the ESG news. Investors respond less favorably to positive earnings news when there is concurrent salient ESG news regardless of the direction. Overall, the pattern of the investor pricing response is consistent with a screening approach where investors first filter on earnings news, and then consider ESG news only when the earnings news is positive.

Our second set of empirical analyses investigates the investor response to earnings news conditional on ESG news. This approach complements our first set of analyses because it reverses the order of investor screening (i.e., ESG news is now the first filter) and because it shifts the examination sample to ESG news days outside the earnings announcement period. Unlike our first analyses, the earnings and ESG news are not released on the same day. As a result, we use the most current earnings news in these specifications. This approach is consistent with the investor screening phenomena that we are interested in. In simple terms, after an investor uses the newly released ESG news as his first filter, he will then use the most current earnings information if he

intends to use earnings news as a secondary filter. At the time of the ESG news, the most current earnings news will typically be from the last quarter. As with our first analyses, our results indicate that the investor price response to ESG news is heavily influenced by the most current earnings news, and in particular by negative earnings news. The investor price response to all types of ESG news is lower for firms that missed their earnings forecast. In addition, we find that the difference in the investor response across firms that missed versus firms that beat the consensus forecast is significant for each type of ESG News. The variation in the price response across groups of firms indicates that even when investors first filter on the most salient ESG news, the most current earnings news plays a significant role in their response.

The analysis of the information content of and disagreement created by ESG and earnings news conducted using absolute returns and turnover add nuance to our findings. In particular, the results of these analyses indicate that the strongest investor response across both measures occurs when earnings news is negative, and in particular when both earnings and ESG news is negative. This result indicates that the uncertainty created by negative earnings news is magnified when it is accompanied by negative ESG news. Overall, these results indicate that the investor response to ESG news varies based on earnings news, which provides additional support for our conclusion that investors use a screening approach where they filter first on earnings news.

We conduct supplementary analyses that show the effects we document for ESG news do not hold when we use the firm's overall ESG performance proxied by the firm's ESG Score. Specifically, on earnings announcements days, there is no differential response to earnings news based on the firm's historical ESG score across eight out of nine specifications. This finding implies that after the first filter based on earnings news, investors do not appear to screen based on the firm's ESG type (i.e., the firm has a high versus a low aggregate ESG score).

We make several contributions to the literature. First, we call attention to the potential interdependence between investor evaluations of information from different sources (i.e., Beyer, Cohen, Lys, and Walther, 2010), and thereby contribute to a more complete understanding of the joint importance of financial and ESG performance information in investor screening. Our analyses reveal that investors do not screen on ESG news when the earnings news is negative, yet investors always screen on earnings news even for the most salient ESG news. These results have important implications for studies that focus on market reactions to ESG news outside of earnings announcements days (e.g., Serafeim and Yoon, 2022a,b; Burzillo, Shaffer, and Sloan, 2022; Moss, Naughton, and Wang, 2023), since the direction of the most current earnings news clearly plays a role in the investor response to these ESG news events.

Second, we contribute to the literature that examines how ESG performance relates to the processing of financial information (e.g., Cheng and Wahid, 2017; Berkovitch et al., 2022). While these prior studies document differences in capital market consequences such as earnings informativeness or stock price discovery, we find that historical ESG performance matters much less than new ESG news when investors are trading around earnings announcements. In fact, we find that investors do not appear to incorporate historical information on the firm's ESG performance when responding to earnings news.

Lastly, our study examines how investors respond to ESG news when they also receive financial news and whether there are certain situations where one type of information is not decision-useful (e.g., the direction of ESG performance is irrelevant when the financial information is negative). In this respect, our analyses can be considered in the context of prior studies that examine how investors process 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, 2022). Our study is distinguished by a focus on the release of firm-specific earnings information rather than macroeconomic shocks.

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 that examines 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). The common goal of these studies is to understand whether current ESG performance has implications for future financial performance. For example, Servaes and Tamayo (2012) show that there is an association between current ESG performance and future firm value for high customer awareness firms. In general, these studies use annual measures of both ESG and financial performance and long sample periods to support their conclusions.

Two streams of literature have developed from these studies. In the first stream, there are studies that examine how overall ESG performance (typically proxied for using the MSCI ESG score) relates to the processing of financial information. For example, Bartov and Li (2017) show that higher ESG performance is associated with stronger earnings response coefficients and lower post-earnings announcement drifts. Similarly, Berkovitch et al. (2022) document differences in stock price discovery based on a firm's overall ESG performance (i.e., firms with higher ESG

ratings command faster incorporation of earnings news into stock prices). In addition, Cheng and Wahid (2017) find that voluntary adoption of ESG reports is associated with higher earnings response coefficients in the periods subsequent to the adoption.

The second stream examines how investors respond to new ESG performance information. In these studies, the expectation is that preferences for ESG performance will generate trading volume and portfolio turnover in response to ESG disclosures. This expectation is important because it can give rise to investor clientele and base effects, which can affect firms' cost of capital and feed back into firms' future ESG activities (Christensen, Hail, and Leuz, 2021; Goldstein, Kopytov, Shen, and Xiang, 2022). These studies have been conducted using analytical, experimental, and empirical approaches. In the analytical literature, Friedman and Heinle (2016) develop a model where stock prices are influenced by investor preferences for socially responsible activities. They show that these preferences operate independently of cash flow information. In experimental studies, Cheng, Green, and Ko (2015) and Martin and Moser (2016) both report evidence that participants in their experiments have preferences for firms that have better ESG performance.

In the empirical literature, several studies have used an event study methodology to examine how investors respond to new information about ESG performance. For example, Griffin and Sun (2013) document a positive stock price response to the voluntary disclosure of greenhouse gas (GHG) 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 (2022b) find a positive (negative) market reaction to positive (negative) ESG news. In contrast, Burzillo, Shaffer, and Sloan (2022) examine the stock market reaction to the release of corporate sustainability reports incorporating SASB metrics. Using a variety of approaches, they

find little evidence that these reports provide decision-useful information to investors. Moss, Naughton, and Wang (2023) document broader investor responses to ESG disclosures, but they fail to find evidence that ESG disclosures inform retail investors' buy and sell decisions.

Neither of these two streams of literature examines how investors respond to the combination of ESG and financial news. In the first stream, the investor response to earnings information is conditioned on historical ESG performance rather than new information about ESG performance. In the second stream, studies have examined the investor response to ESG news independently of financial news, an approach that is typically accomplished by eliminating from the analyses ESG disclosures that occur 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 respond to simultaneously provided ESG and financial news.

In this paper, we propose that the concurrent processing of ESG and financial performance information by investors warrants additional examination. Many practitioners view the incorporation of ESG information by investors as a supplement rather than a substitute for financial information. In other words, it is likely to be the case that investors jointly consider ESG and financial information when making trading decisions. If so, then a more complete understanding of how investors use ESG disclosure requires that we examine concurrently provided ESG and financial information. In addition, from a research design perspective, investors are likely to be the most attentive to newly disclosed information during periods when financial information is being provided, which could generate different conclusions as to the usefulness of ESG information to investors when compared to studies that only consider isolated ESG disclosures.

3. Data and Sample

3.1 Sample Construction

We use Truvalue Labs (TVL) data to obtain ESG information. This data covers the period January 2009 through December 2019. The reason for the 2019 end date is 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, Refinitive, 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.[3]

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 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

[3] See Section 3.1 in Serafeim and Yoon (2022b) for a detailed description and interpretation of the TVL data.

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. Our sample of interest (earnings announcement days and ESG news days) contains 3,690 unique firms and 484,344 firm-days.

3.2 Descriptive Statistics

The sample composition by year and by industry are provided in Table 1. Panel A shows that there is an increasing pattern in the number of firm-years through 2015, at which point the number of firm years remains roughly stable. The pattern in the number of firm-days is similar, with increases each year through 2015, and a roughly stable number of firm-days from that point forward. Panel B shows that SIC codes covering Manufacturing make up about 42.6 percent of the sample, which is consistent with the general distribution of firms across SIC codes.

Table 2 Panel A presents the descriptive statistics for the final sample. We use three short window market reaction variables commonly used in the literature to proxy for investor reaction: signed and absolute cumulative abnormal returns (*CAR* and *AbsCAR*) and *Turnover*. *CAR* is the cumulative market-adjusted return during trading days [-1,1] multiplied by 100, *AbsCAR* is the absolute value of *CAR*, and *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. The descriptive statistics show that the mean is greater than the median for each of the three variables, consistent with a positively skewed distribution.

We use the change in daily TVL Pulse score (*ESGScore*) as a proxy for new ESG information. We create the binary variable *ESGNewsNeg* (*ESGNewsPos*) 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 ± 5% threshold to identify the most salient ESG news events, as those cutoffs correspond to approximately the highest and lowest quartiles of the observations in our sample conditional on a change in *ESGScore*. Appendix B provides examples of these events. The descriptive statistics reveal that these types of score changes occur on 3.4% of all trading days. *LowESG* (*HighESG*) is an indicator variable that is set equal to one if the firm's TVL Pulse score was in the bottom (top) 10% of all firms in the CRSP-TVL merged sample in the previous month. Lastly, *ESGScore* has a mean and median that are fairly close (mean = 0.528 and median = 0.521) indicating that there is only a slight positive skew, and the standard deviation is 0.164 while the first and third quartiles are 0.429 and 0.628, respectively, indicating that the *ESGScore* has a somewhat narrow distribution.

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, firms tend to be large (the average market cap is 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). In addition, 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.

Table 2 Panel B provides descriptive information on the differences in ESG variables across EA and non-EA days. The average percentage change in the *ESGScore* variable is about 0.562% on EA days compared with 0.664% 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* across EA and non-EA days. However, there are statistically significant differences in

the occurrence of both salient negative and positive ESG news on EA days when compared to non-EA days. Approximately 2.4 percent (2.2 percent) of salient negative (positive) ESG News days coincide with EA days compared with only 1.7 percent (1.7 percent) for non-EA days. These findings suggest that salient ESG information is more likely to be made available on EA days relative to non-EA days. This is noteworthy given that prior studies investigating the importance of ESG news to investors have typically ignored ESG news provided during earnings announcement periods.

The final column of Table 2 Panel B provides the distribution of ESG News Days, defined as non-earnings announcement days where the change in a firm's TVL ESG Pulse score is non-zero. As previously noted, the ± 5% threshold to identify the most salient ESG news events corresponds to approximately the highest and lowest quartile of the ESG News Day observations. Of the 394,236 news days, 90,782 (23.0%) are classified as negative and 92,320 (23.4%) are classified as positive. The absolute percentage change in the TVL Pulse Score is approximately double the average change, indicating that there are roughly equal numbers of positive and negative changes in the TVL Pulse Score across our sample.

4. Research Design and Results

4.1 Overview

The goal of our empirical analyses is to provide insights into how investors use the combination of financial and nonfinancial information to screen investments. In general, screening is a process through which certain attributes are used to either include or exclude potential investments. For example, negative ESG screening would entail eliminating from consideration firms that are the worst performers on ESG dimensions, whereas positive ESG screening would

limit consideration to firms that are the best performers on ESG dimensions. Investors will typically order their preference for financial and nonfinancial information as part of the screening process. For example, investors may use a positive screen to identify the acceptable set of high performing ESG companies and then take the step of selecting specific investments based on financial information. Alternatively, investors may select the initial set of investments based on financial performance and then take the step of negative screening to eliminate specific investments based on poor ESG performance.

The above discussion highlights two attributes that form the basis of our empirical tests. First, our tests use subsamples that allow us to better understand investors' use of financial and nonfinancial information. For example, our first set of analyses uses subsamples based on earnings news to investigate the incremental response to ESG news conditional on earnings. Second, our tests separate "good" and "bad" news across both financial and nonfinancial measures. For example, we separate ESG news into positive and negative and we focus our analyses on understanding the differential response to positive versus negative news. This research design choice allows us to provide insights into whether investors are making choices based on differences in ESG news, consistent with screening. For example, we can conclude that there is no evidence that ESG news is part of a screening process if there is no difference in the investor response to positive and negative ESG news.

Our tests proceed in three parts. First, we examine the investor response to ESG news conditional on earnings news. Next, we examine the investor response to earnings news conditional on ESG news. Collectively, these two sets of tests provide insights into the interdependence of ESG and earnings information in investor screening. Third, we conduct a series of robustness tests to validate the conclusions derived from our first two sets of analyses. For

example, we examine whether investors incorporate the firm's ESG score in their response, which helps sharpen our conclusions because we can disentangle whether investors are screening based on firm type or newly available information.

4.2 Investor Response to ESG News on Earnings News Days

Our first set of analyses focuses on the investor response across groupings of earnings and ESG information on earnings announcement days. For both earnings and ESG, we use three groupings that are broadly intended to identify negative, other and positive news. The three groupings of ESG news are *ESGNewsNeg*, *ESGNewsOther*, and *ESGNewsPos*. As described in Section 3.2, *ESGNewsNeg* (*ESGNewsPos*) 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) quartile of score changes conditional on the provision of ESG news. *ESGNewsOther* captures all other ESG news events (i.e., those where the change in the TVL Pulse score was between -5% and 5%). The three groupings of earnings information are based on the relation between reported earnings and the consensus analyst EPS forecast. *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].

Table 3 Panel A presents the number of observations in each of the nine groups. The majority of the observations are located in the row corresponding to *ESGNewsOther*, with about 2.4% (2.2%) of the observations in the row corresponding to negative (positive) news. This distribution is expected and indicates that our categorization of ESG news events identifies the most salient event days. The distribution of observations across earnings performance groupings is consistent with prior literature, with about 32.9 (50.5) percent of observations missing (beating) the earnings estimate.

We measure the investor response across each of the nine possible combinations of the above groupings of earnings and ESG news using three short window market reaction variables commonly used in the literature: signed and absolute cumulative abnormal returns (*CAR* and *AbsCAR*) and share turnover (*Turnover*). Broadly, *CAR* captures price implications (i.e., there was a change in the consensus view of the value of the firm), whereas *AbsCAR* and *Turnover* capture the information content of the news (i.e., there was trading due to investors updating their prior assessment of the firm or disagreement among investors in their interpretation of the news).

The investor response measured using *CAR* (*AbsCAR*) [*Turnover*] is presented in Table 3 Panel B (C) [D]. In Panel B, there is a clear difference in *CAR* across each of the earnings groupings. The average return response is approximately -2.9% for *MissEst*, -0.5% for *MeetEst*, and +2.3% for *BeatEst*. However, there is no detectable difference in *CAR* across ESG news groupings when the firm either misses or meets the earnings forecast. For example, in the *MissEst* grouping, the average return response is -3.0%, -2.9%, and -2.7% across each of the three ESG groupings. These results indicate that investors do not incrementally adjust their valuation of the firm based on simultaneously provided ESG news when earnings news is not positive, suggesting that ESG news is of minimal importance when the earnings news is not positive.

In contrast, there are statistically different pricing responses to each of the three types of ESG news conditional on positive earnings news. However, these differences in returns are not simply linear functions of the level of positivity in the ESG news. The largest return response is to *ESGNewsOther* at 2.3%, the next largest is to *ESGNewsPos* at 1.9%, and the lowest is to *ESGNewsNeg* at 1.4%. Overall, these results indicate that investors respond less favorably to positive earnings news when there is concurrent salient ESG news regardless of the direction. This reaction is consistent with perceived ambiguity and uncertainty with respect to investors'

interpretation of ESG news. For example, 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 *AbsCAR* results in Panel C also show variation based on the direction of both the earnings and ESG news. As expected, the overall informativeness of earnings news in the *MeetEst* column is less than either the *MissEst* or *BeatEst* columns, with the *MissEst* column containing the largest changes in *AbsCAR*. The largest response measured using *AbsCAR* occurs when there is both negative ESG and negative earnings news, and that difference is statistically larger than any other combination of ESG and earnings news. This result indicates that the uncertainty created by negative earnings news is magnified when it is accompanied by negative ESG news. In the *BeatEst* column, the smallest *AbsCAR* occurs when the ESG news is positive, which indicates that the information content of news is the lowest when positive earnings news is accompanied by positive ESG news as opposed to non-positive ESG news.

The *Turnover* results in Panel D provide similar results to those in Panel C. The trading response in the *MeetEst* column is less than either the *MissEst* or *BeatEst* columns, with the *MissEst* column containing the largest *Turnover*. This pattern indicates that investor disagreement is higher when the firm either misses or beats the consensus forecast. Once again, the largest investor response occurs when negative earnings news is accompanied by negative ESG news, indicating that the investor disagreement created by negative earnings news is magnified when it is accompanied by negative ESG news.

Collectively, the results in Table 3 provide strong evidence that the investor response to earnings news varies based on the nature of the concurrently provided ESG news. While investors seem to ignore the pricing implications of ESG news when the firm misses its consensus forecast,

there is increased trade and uncertainty associated with negative ESG news relative to either positive or other ESG news.

4.3 Investor Response to Earnings News on ESG News Days

Our next analysis switches the order of the news events. Rather than examining the effect of ESG news conditional on earnings news, we examine the effect of earnings news conditional on ESG news. This complementary analysis focuses on event days outside the earnings announcement period, and hence provides insights into how financial performance influences the investor response to subsequent ESG news. In this analysis, we group firms based on the earnings news in the prior quarter. This approach is consistent with the screening phenomena that we are interested in. In simple terms, if an investor is using earnings news as a secondary filter, then he will use the most current earnings information when using the newly released ESG news as his first filter. At the time of the ESG news, the most current earnings news will typically be from the last quarter.

Our research design mirrors Section 4.2. We continue to use three groupings that are broadly intended to identify negative, other and positive ESG and earnings news. The three groupings of ESG news are identical to those used in Section 4.2. The three groupings of earnings information are based on the relation between reported earnings and the consensus analyst EPS forecast from the last quarter. $MissEst_{q-1}$ ($MeetEst_{q-1}$) [$BeatEst_{q-1}$] 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]. Summary information on the sample, provided in Table 4 Panel A, shows that there are more observations (394,236) than Table 3 (90,108) because there are more ESG news days than there are earnings announcements days. In total, there are 183,102 ESG news

days where the information is either negative or positive, which represents just under half of all ESG news days.

We investigate the same three measures of investor response, with the *CAR* (*AbsCAR*) [*Turnover*] results provided in Table 4 Panel B (C) [D]. Across the columns of Panel B, it is always the case that the price response for the $MissEst_{q-1}$ group is lower than the price response for the $BeatEst_{q-1}$ group. For example, in the first column, the price response is -7.1 basis points for $MissEst_{q-1}$ and +3.8 basis points for $BeatEst_{q-1}$, which represents a difference that is significant at the 1% level. Collectively, these results indicate that the price response is dominated by negative earnings news, as the price response is always lower for these groups of firms.

This finding expands the result in Table 3 from the earnings announcement period to the non-earnings announcement period. In addition, it also highlights the fact that even when salient ESG news is the first filter, investors respond to the news differently based on the second filter. Overall, the combined results in Table 3 and Table 4 indicate that negative earnings news strongly influences the price response to ESG news throughout the quarter. These results have important implications for studies that focus on market reaction to ESG news outside of earnings announcements, since the direction of the most current earnings news clearly plays a differentiating role in how investors respond to ESG news.

The results in Table 4 Panel C and Panel D show that the highest levels of information content and investor disagreement are both present in the $MissEst_{q-1}$ subsamples. The average investor response is statistically higher in the $MissEst_{q-1}$ group than the $BeatEst_{q-1}$ group in all six specifications at the 1% level of significance. Consistent with Panel B, these results indicate that the response to ESG news is affected by the most current earnings news, and in particular, negative earnings news generates the largest subsequent investor response to ESG news. In addition, there

is no discernible difference for the *ESGNewsNeg* and *ESGNewsPos* subsamples for each of the three subsamples of earnings news. Collectively, we interpret the results in Table 4 as evidence that earnings news dominates ESG news. No matter the direction of the ESG news, the investor response is stronger for the $MissEst_{q-1}$ subsample.

4.4 Multivariate Analyses

Next, we expand the univariate comparisons in the prior subsections to a multivariate analysis using the following specifications:

$$INVESTOR\_RESPONSE_{i,t} = \alpha + \beta_1 ESGNewsNeg_{i,t} + \beta_2 ESGNewsPos_{i,t} + ESGScore_{i,t} + \Sigma\gamma_j Controls_{i,t} + Fixed\ Effects + \varepsilon_{i,t} \quad (1)$$

$$INVESTOR\_RESPONSE_{i,t} = \alpha + \beta_1 MissEst_{q-1i,t} + \beta_2 BeatEst_{q-1i,t} + ESGScore_{i,t} + \Sigma\gamma_j Controls_{i,t} + Fixed\ Effects + \varepsilon_{i,t} \quad (2)$$

We estimate equation (1) based on the sample of earnings announcement days and estimate equation (2) based on the sample of ESG news days. We continue to measure *INVESTOR_RESPONSE* using three short window market reaction variables commonly used in the literature: signed and absolute cumulative abnormal returns (*CAR* and *AbsCAR*) and share turnover (*Turnover)*. We control for 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 current overall commitment to ESG. We also control for a comprehensive set of variables that are typically employed in specifications that assess 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*), the Market-to-book ratio (*M/B*), total debt divided by total assets (*Leverage*), quarterly sales growth (*SalesGrowth*), the number of analysts covering the firm (*Analysts*), the standard deviation of returns over the prior three months

(*RetVol*), the percentage of shares held by institutional investors (*InstOwn*), earnings persistence (*EarnPersist*), the number of days between the earnings announcement and fiscal quarter end (*ReportLag*), and an indicator for firms reporting negative earnings (*Loss*). In equation (1), we control for the absolute earnings surprise (*AbsSurp*) and in equation (2) control for prior quarter's absolute earnings surprise ($AbsSurp_{q-1}$). We also include two sets of fixed effects, firm and date, to fully absorb time-invariant cross-firm heterogeneity and time trends.[4] In addition, 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) in Table 5 show that there are statistically significant differences in the investor price response to positive versus negative ESG news in subsamples that analyze firms that beat the consensus forecast, but no such differences in the subsamples that analyze firms that missed the consensus forecast. Specifically, in columns (1), (4), (7), where firms missed the consensus forecasts, there is no statistical difference between the *ESGNewsNeg* coefficient and the *ESGNewsPos* coefficient. These results contrast with columns (3), (6), and (9), where there are discernable differences (*p*-values of 0.105, 0.048, and 0.029, respectively). For example, in Column (9) where *Turnover* is the dependent variable, the coefficient for *ESGNewsNeg* is 0.190 and for *ESGNewsPos* is 0.080, a difference that is significant at the 5% level. In addition, both of the individual coefficients are different from the *ESGNewsOther* firms (i.e., the benchmark group) at the 1% and 5% levels, respectively. Overall, these multivariate results confirm the primary conclusions from Table 3. Collectively, it appears that investors do not distinguish between different types of ESG news when the earnings news is negative, but do when the earnings news is positive.

[4] 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 deHaan (2021).

The results of equation (2) in Table 6 also confirm our earlier conclusions that earnings news continues to influence investors' response to subsequent salient ESG news. For example, in column (1), the price response is -4.6 basis points for the firms that missed the most current earnings forecast relative to those who met the forecast, and the price response is +5.1 basis points for the firms that beat the most current earnings forecast relative to those who met the forecast. The difference between these coefficients is significant at the 1% level. While the difference between the $MissEst_{q-1}$ and $BeatEst_{q-1}$ subsamples is significant across all six columns that contain salient directional ESG news (i.e., either *ESGNewsNeg* or *ESGNewsPos*), only one of the three columns that contain less salient ESG news presents coefficients that are statistically different.

4.5 Investor Response to ESG Score on Earnings News Days

Finally, we shift to see what additional insights can be gained through analyses that include proxies for firm type (i.e., firms that have a certain level of ESG performance) rather than focusing solely on ESG news. We use the following specification, which follows from equation (1) estimated based on a sample of earnings announcement days:

$$INVESTOR\_RESPONSE_{i,t} = \alpha + \beta_1 LowESG_{i,t} + \beta_2 HighESG_{i,t} + \sum \gamma_j Controls_{i,t} + Fixed\ Effects + \varepsilon_{i,t} \quad (3)$$

As before, we measure *INVESTOR_RESPONSE* using the same three short window market reaction variables. We also include the same control variables as equation (1) (except we exclude *ESGScore* as discussed below) and continue to use firm fixed effects and date fixed effects. The difference between equation (3) and equation (2) is the use of *LowESG* and *HighESG* in lieu of the ESG news variables. *LowESG* (*HighESG*) is an indicator variable that is set equal to one if the firm's average TVL Pulse score in the prior month was in the bottom (top) 10% of all firms. The intuition behind using *LowESG* and *HighESG* is that they capture the firms' "type" from an ESG

perspective. The specification in equation (3) allows us to determine whether investors respond differently based on the firm's cumulative ESG performance. Again, we estimate equation (3) using the three subsamples of observations where the firm missed the consensus EPS forecast, met the consensus forecast, and beat the consensus forecast.

Table 7 presents the results. The differences in the coefficients on *LowESG* and *HighESG* are generally insignificant. These results suggest that once an investor screens on earnings news, there is no differential response to earnings information based on whether the firm is high or low performing from an ESG standpoint. In other words, once investors screen based on earnings, we do not detect that there is additional screening based on firms' historical ESG performance. We note that the price response result in column (1) is inconsistent with the risk management theory that suggests ESG performance acts as a form of reputation insurance (Godfrey, 2005; Godfrey, Merrill, and Hansen, 2009; Minor and Morgan 2011), which would predict a differential response to *LowESG* and *HighESG* when the firm misses the consensus EPS forecast.

Overall, the results in Table 7 suggest that the firm's past ESG performance generates a weaker investor response than ESG news. Broadly, we conclude that new ESG information is substantially more important to investors than the firm's overall ESG performance. This is reassuring from a market efficiency standpoint, but it also has implications for studies of ESG disclosures more generally. The use of ESG scores that are updated quarterly or annually is a common feature of the literature, and the differences in our findings suggest that this common feature might be leading to different conclusions that would be obtained using a short-window measure of new ESG performance. In other words, inferences about how investors interpret earnings news in the presence of ESG information may be different if the ESG information is new (as in our Tables 3 through 6) as opposed to stale (as in our Table 7).

5. Conclusion

Our findings have implications for the use of ESG performance information in investing decisions. We document a number of interdependencies across financial and ESG news. First, it appears that when investors first filter on earnings, there is no evidence that they incorporate differences in negative and positive ESG news when the firm misses the consensus EPS forecast. This finding suggests that screening on ESG information depends on the nature of the earnings news, an interdependency unexplored by prior studies. In contrast, when investors first filter on ESG news, they always incorporate information about the prior financial performance of the firm. In addition, we find that ESG news only influences investors when the earnings news is not negative and find that what influences investors is generally new rather than historical ESG performance information.

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Appendix A: Variable Definitions

Variable	Description	Source
Investor Reaction Variables:		
CAR	Cumulative market-adjusted return during trading days [-1,1], multiplied by 100.	CRSP
AbsCAR	Absolute value of the cumulative market-adjusted return during trading days [-1,1], multiplied by 100.	CRSP
Turnover	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
ESG News & Performance Type Variables:		
ESGNewsNeg	Indicator variable set to one if the change in the TVL Pulse score from the previous trading day is less than -5%.	Truvalue Labs
ESGNewsPos	Indicator variable set to one if the change in the TVL Pulse score from the previous trading day is greater than 5%.	Truvalue Labs
LowESG	Indicator variable set to one if the firm's TVL Pulse score in the prior month was in the bottom 10% of the CRSP-TVL universe.	Truvalue Labs
HighESG	Indicator variable set to one if the firm's TVL Pulse score in the prior month was in the top 10% of the CRSP-TVL universe.	Truvalue Labs
ESGScore	Daily TVL Pulse score (scaled from zero to one).	Truvalue Labs
Earnings News & Performance Type Variables:		
$MissEst_{q-1}$	Indicator variable set to one if the firm missed its prior quarter's analysts' consensus EPS forecast.	I/B/E/S
$BeatEst_{q-1}$	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
AbsSurp	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 the consensus EPS forecast from I/B/E/S one month before the earnings announcement. Multiplied by 100.	CRSP, I/B/E/S
$AbsSurp_{q-1}$	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

Variable	Description	Source
Other Variables:		
Size	The natural log of the market value of equity (PRCCQ* CSHOQ).	Compustat
M/B	Market-to-book ratio calculated as (PRCCQ*CSHOQ)/CEQQ.	Compustat
Leverage	Total debt (DLCQ + DLTTQ) divided by total assets (ATQ).	Compustat
SalesGrowth	The percentage change in sales (SALEQ) over the previous quarter.	Compustat
Analysts	The natural log of one plus the number of analysts following the firm over the previous 45 days.	I/B/E/S
RetVol	The standard deviation of daily returns over the three prior months.	CRSP
InstOwn	The percentage of shares outstanding held by institutional investors.	Thomson Reuters
EarnPersist	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
ReportLag	The number of days between fiscal-quarter end and the earnings announcement date.	Compustat
Loss	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

Lumber Liquidators Holdings, Inc.

REUTERS

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.

CNBC

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

Marathon Oil

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

Panel B: ESG News Not Concurrent With Earnings Announcement

(B1) Monster Beverages energy drinks linked to deaths

(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 Justince (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 Composition

Panel A: Sample Composition by Year

	Firms Years		*Firm Days*	
Year	*N*	*%*	*N*	*%*
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%*

Panel B: Sample Composition by Industry (1-digit SIC)

		Firms		*Firm Days*	
SIC1	*Industry Description*	*N*	*%*	*N*	*%*
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	701	19.0	84,718	17.5
3	Manufacturing	872	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	623	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	3	0.1	3,592	0.7
Total		3,690	*100.0%*	484,344	*100.0%*

The sample contains 3,690 unique firms and 484,344 firm-days from January 2009 to December 2019. Panel A (B) 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

Panel A: Descriptive Statistics for Variables Used in the Regression Analyses

	N	*Mean*	*Std. Dev.*	*P25*	*Median*	*P75*
Investor Reaction Variables:						
CAR	484,344	0.048	4.184	-1.505	0.008	1.561
AbsCAR	484,344	2.731	3.547	0.669	1.533	3.207
Turnover	484,344	1.173	1.276	0.478	0.762	1.323
ESG News & Performance Type Variables:						
ESGNewsNeg (Indicator)	484,344	0.192	0.394			
ESGNewsPos (Indicator)	484,344	0.195	0.396			
LowESG (Indicator)	484,344	0.048	0.214			
HighESG (Indicator)	484,344	0.047	0.212			
ESGScore	484,344	0.528	0.164	0.429	0.521	0.628
Earnings News & Performance Type Variables:						
$MissEst_{q-1}$ (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
Other Variables:						
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			

Panel B: Mean of ESGNews by EA Days, Non-EA Days, and ESG News Days

	EA Days (1)	Non-EA Days (2)	*p*-value (EA Days = Non-EA Days) (3)	ESG News Days (4)
N	90,108	5,439,743		394,236
%ΔESGScore	0.562	0.664	[0.788]	9.164
Abs%ΔESGScore	1.676	1.419	[0.501]	19.584
Count of ESGNewsNeg Days	2,125	90,782		90,782
% of ESGNewsNeg Days	*0.024*	*0.017*	[*0.000*]	0.230
Count of ESGNewsPos Days	2,002	92,320		92,320
% of ESGNewsPos Days	*0.022*	*0.017*	[*0.000*]	0.234

(*Continued*)

Table 2 (Continued)

The table presents descriptive statistics. Panel A presents distributional descriptive statistics for variables used in our analyses. Definitions for each variable can be found in Appendix A. Panel B presents the means of *%ΔESGScore* (*Abs%ΔESGScore*), the daily percentage change (daily absolute percentage change) in a firm's TVL ESG Pulse score, the count of *ESGNewsNeg* (*ESGNewsPos*) Days, and the % of *ESGNewsPos* (*ESGNewsNeg*) Days, by earnings announcements days (EA days), non-earnings announcements days (Non-EA Days), and non-earnings announcement days where the change in a firm's TVL ESG Pulse score is non-zero (ESG News Days). Panel B also reports *p*-values from *t*-tests comparing the equality of means across EA Days and Non-EA Days.

Table 3: Univariate Comparisons for Earnings Announcement Days

Panel A: Number of Observations

		EA News		
		(1) MissEst	(2) MeetEst	(3) BeatEst
ESG News	[1] ESGNewsNeg	622	350	1,153
	[2] ESGNewsOther	28,436	14,272	43,273
	[3] ESGNewsPos	585	298	1,119

Panel B: CAR

		EA News		
		(1) MissEst	(2) MeetEst	(3) BeatEst
ESG News	[1] ESGNewsNeg	-2.973	-0.542	1.390
	[2] ESGNewsOther	-2.893	-0.479	2.294
	[3] ESGNewsPos	-2.722	-0.760	1.871
	p-value: [1] = [2]	0.778	0.857	0.000
	p-value: [2] = [3]	0.561	0.455	0.042
	p-value: [1] = [3]	0.554	0.654	0.089

Panel C: AbsCAR

		EA News		
		(1) MissEst	(2) MeetEst	(3) BeatEst
ESG News	[1] ESGNewsNeg	6.659	4.870	5.767
	[2] ESGNewsOther	6.200	4.988	5.806
	[3] ESGNewsPos	6.351	4.632	5.196
	p-value: [1] = [2]	0.043	0.649	0.799
	p-value: [2] = [3]	0.517	0.205	0.000
	p-value: [1] = [3]	0.370	0.519	0.009

Panel D: Turnover

		EA News		
		(1) MissEst	(2) MeetEst	(3) BeatEst
ESG News	[1] ESGNewsNeg	2.441	1.946	2.217
	[2] ESGNewsOther	1.696	1.445	1.748
	[3] ESGNewsPos	2.071	1.757	2.081
	p-value: [1] = [2]	0.000	0.000	0.000
	p-value: [2] = [3]	0.000	0.000	0.000
	p-value: [1] = [3]	0.002	0.144	0.094

(*Continued*)

Table 3 (Continued)

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 (*ESGNewsNeg*). 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 (*ESGNewsOther*). 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 (*ESGNewsPos*). 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 *AbsCAR* in each partition. *AbsCAR* is the absolute value of 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, C and D also report *p*-values from *t*-tests comparing the equality of means.

Table 4: Univariate Comparisons for ESG News Days (Non-EA Days where *Abs%ΔESGScore* >0)

Panel A: Number of Observations

		ESG News		
		(1) ESGNewsNeg	(2) ESGNewsOther	(3) ESGNewsPos
EA News	[1] $MissEst_{q-1}$	26,277	54,031	26,722
	[2] $MeetEst_{q-1}$	8,704	18,307	8,755
	[3] $BeatEst_{q-1}$	55,801	138,796	56,843

Panel B: CAR

		ESG News		
		(1) ESGNewsNeg	(2) ESGNewsOther	(3) ESGNewsPos
EA News	[1] $MissEst_{q-1}$	-0.071	0.004	0.007
	[2] $MeetEst_{q-1}$	0.036	0.045	0.048
	[3] $BeatEst_{q-1}$	0.038	0.044	0.089
	p-value: [1] = [2]	0.027	0.123	0.394
	p-value: [2] = [3]	0.953	0.973	0.252
	p-value: [1] = [3]	0.000	0.004	0.001

Panel C: AbsCAR

		ESG News		
		(1) ESGNewsNeg	(2) ESGNewsOther	(3) ESGNewsPos
EA News	[1] $MissEst_{q-1}$	2.711	2.116	2.664
	[2] $MeetEst_{q-1}$	2.274	1.719	2.197
	[3] $BeatEst_{q-1}$	2.133	1.704	2.068
	p-value: [1] = [2]	0.000	0.000	0.000
	p-value: [2] = [3]	0.000	0.349	0.000
	p-value: [1] = [3]	0.000	0.000	0.000

Panel D: Turnover

		ESG News		
		(1) ESGNewsNeg	(2) ESGNewsOther	(3) ESGNewsPos
EA News	[1] $MissEst_{q-1}$	1.270	1.106	1.241
	[2] $MeetEst_{q-1}$	1.069	0.855	1.010
	[3] $BeatEst_{q-1}$	1.111	0.941	1.088
	p-value: [1] = [2]	0.000	0.000	0.000
	p-value: [2] = [3]	0.002	0.000	0.000
	p-value: [1] = [3]	0.000	0.000	0.000

(*Continued*)

Table 4 (Continued)

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 (*ESGNewsNeg*). 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 (*ESGNewsOther*). 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 (*ESGNewsPos*). The sample in row [1] consists of earnings announcement days where firms missed the prior quarter's analysts' consensus forecast ($MissEst_{q-1}$). The sample in row [2] consists of earnings announcement 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 earnings announcement 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 *AbsCAR* in each partition. *AbsCAR* is the absolute value of 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, C and D also report *p*-values from *t*-tests comparing the equality of means.

Table 5: Investor Reaction to ESG News on Earnings Announcement Days

	EANews *MissEst*	EANews *MeetEst*	EANews *BeatEst*	EANews *MissEst*	EANews *MeetEst*	EANews *BeatEst*	EANews *MissEst*	EANews *MeetEst*	EANews *BeatEst*
Dependent	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Variables:	*CAR*	*CAR*	*CAR*	*AbsCAR*	*AbsCAR*	*AbsCAR*	*Turnover*	*Turnover*	*Turnover*
(1) ESGNewsNeg	-0.297	-0.218	-0.390*	0.612***	0.013	0.420***	0.240***	0.135**	0.190***
	(-0.92)	(-0.58)	(-1.83)	(2.72)	(0.05)	(2.83)	(3.47)	(2.08)	(4.77)
(2) ESGNewsPos	0.055	-0.312	0.080	0.454**	0.216	0.037	0.099*	0.065	0.080**
	(0.18)	(-0.75)	(0.38)	(1.97)	(0.69)	(0.27)	(1.82)	(0.88)	(2.36)
p-value: (1) = (2)	[0.417]	[0.865]	[0.105]	[0.622]	[0.591]	[0.048]	[0.092]	[0.454]	[0.029]
AbsSurp	-48.217***	472.265***	64.088***	32.099***	-64.324	44.219***	6.049***	-44.042***	6.257***
	(-9.87)	(5.59)	(10.50)	(8.63)	(-1.16)	(9.71)	(6.73)	(-4.29)	(4.69)
ESGScore	-0.173	-0.524	0.012	-0.059	0.146	-0.274**	-0.052	-0.090*	-0.075**
	(-0.69)	(-1.50)	(0.06)	(-0.32)	(0.62)	(-1.97)	(-1.17)	(-1.79)	(-2.17)
Size	-1.847***	-1.910***	-1.968***	0.238**	0.070	-0.874***	0.288***	0.240***	0.094***
	(-12.85)	(-9.10)	(-16.30)	(2.31)	(0.44)	(-10.77)	(8.41)	(5.58)	(2.87)
M/B	-0.002	0.008	-0.003	0.004	0.007	0.002	0.000	-0.000	0.001
	(-0.25)	(0.65)	(-0.39)	(0.77)	(0.87)	(0.35)	(0.19)	(-0.13)	(0.43)
Leverage	-2.357***	-0.737	-0.728*	1.730***	0.871	0.445	0.877***	0.342**	0.537***
	(-4.47)	(-0.90)	(-1.71)	(4.04)	(1.52)	(1.51)	(6.31)	(2.27)	(4.89)
SalesGrowth	1.931***	3.077***	2.341***	-0.409**	-0.289	1.021***	-0.013	0.028	0.206***
	(8.32)	(7.19)	(10.90)	(-2.33)	(-0.98)	(7.32)	(-0.33)	(0.46)	(6.18)
Analysts	-0.216	0.367	0.483***	0.550***	0.497**	0.552***	0.426***	0.311***	0.354***
	(-1.06)	(1.14)	(2.78)	(3.90)	(2.33)	(4.73)	(9.53)	(6.36)	(8.49)
RetVol	0.245***	0.163	-0.087	0.407***	0.495***	0.464***	0.312***	0.286***	0.354***
	(3.56)	(1.46)	(-1.43)	(8.34)	(6.22)	(11.30)	(20.38)	(14.09)	(22.89)
InstOwn	0.004	0.010	0.003	0.009***	0.010**	0.008***	0.007***	0.006***	0.007***
	(0.97)	(1.54)	(0.91)	(2.92)	(2.45)	(3.13)	(6.98)	(4.66)	(7.13)
EarnPersist	0.216*	-0.073	-0.188*	-0.037	-0.060	-0.003	-0.014	0.002	0.014
	(1.87)	(-0.45)	(-1.85)	(-0.41)	(-0.50)	(-0.04)	(-0.52)	(0.06)	(0.69)
ReportLag	0.027**	0.005	-0.026***	0.003	0.003	-0.006	0.000	0.001	0.003
	(2.35)	(0.30)	(-2.70)	(0.39)	(0.20)	(-0.96)	(0.05)	(0.51)	(1.51)

Loss	-0.890***	-0.734***	-1.715***	0.217**	0.069	-0.334***	-0.018	-0.037	-0.091***
	(-6.18)	(-2.67)	(-12.31)	(2.05)	(0.39)	(-3.56)	(-0.69)	(-0.95)	(-3.22)
Firm and Date FE	Included	Included	Included	Included	Included	Included	Included	Included	Included
Adj. R2	0.099	0.075	0.098	0.224	0.247	0.255	0.593	0.632	0.642
N	28,910	13,788	44,949	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), (4) and (7) consists of earnings announcement days where firms missed the analysts' consensus forecast (*MissEst*). The sample in columns (2), (5) and (8) 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), 6) and (9) 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, AbsCAR* and *Turnover* and the independent variables include ESG news and control variables. *ESGNewsNeg* 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. *ESGNewsPos* 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: Investor Reaction to Earnings News on ESG News Days (Non-EA Days where *Abs%ΔESGScore* >0)

	ESGNews Neg	*ESGNews Other*	*ESGNews Pos*	*ESGNews Neg*	*ESGNews Other*	*ESGNews Pos*	*ESGNews Neg*	*ESGNews Other*	*ESGNews Pos*
Dependent	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Variables:	*CAR*	*CAR*	*CAR*	*AbsCAR*	*AbsCAR*	*AbsCAR*	*Turnover*	*Turnover*	*Turnover*
(1) $MissEst_{q-1}$	-0.046	-0.029	-0.024	0.019	-0.012	0.037	0.015	-0.006	0.018
	(-0.89)	(-0.95)	(-0.49)	(0.49)	(-0.35)	(1.07)	(0.86)	(-0.26)	(1.21)
(2) $BeatEst_{q-1}$	0.051	0.006	0.055	-0.059*	-0.080***	-0.055*	-0.026*	-0.018	-0.016
	(1.13)	(0.24)	(1.27)	(-1.74)	(-3.27)	(-1.87)	(-1.70)	(-1.18)	(-1.22)
p-value: (1) = (2)	[0.004]	[0.117]	[0.017]	[0.001]	[0.001]	[0.000]	[0.000]	[0.369]	[0.002]
$AbsSurp_{q-1}$	-2.499	0.517	0.406	13.338***	16.618***	12.162***	2.358*	11.972***	3.056**
	(-0.78)	(0.20)	(0.14)	(5.49)	(4.85)	(5.55)	(1.84)	(3.85)	(2.40)
ESGScore	0.339***	0.154	0.176*	0.020	-0.365***	-0.267***	-0.012	-0.146**	-0.211***
	(3.51)	(1.46)	(1.94)	(0.28)	(-3.57)	(-4.14)	(-0.39)	(-2.17)	(-7.49)
Size	-0.306***	-0.295***	-0.362***	-0.354***	-0.323***	-0.387***	-0.031	-0.163**	-0.043
	(-5.58)	(-5.46)	(-6.35)	(-8.12)	(-7.30)	(-9.84)	(-1.00)	(-2.44)	(-1.31)
M/B	0.001	0.001	-0.000	0.001	0.001	0.004*	0.001	0.001	0.001
	(0.24)	(1.30)	(-0.20)	(0.76)	(1.44)	(1.89)	(0.68)	(0.81)	(0.75)
Leverage	-0.291	0.087	-0.275	0.498***	0.023	0.592***	0.326***	0.163	0.364***
	(-1.32)	(0.52)	(-1.34)	(3.23)	(0.11)	(4.11)	(3.03)	(0.98)	(3.41)
SalesGrowth	-0.024	0.054	0.028	0.063	0.088	0.030	0.052*	0.055	0.046*
	(-0.27)	(0.72)	(0.32)	(0.89)	(1.56)	(0.39)	(1.84)	(1.53)	(1.66)
Analysts	-0.061	-0.040	0.032	0.048	-0.048	0.073	0.084*	-0.085	0.062
	(-0.77)	(-0.69)	(0.41)	(0.71)	(-0.90)	(1.16)	(1.83)	(-1.04)	(1.33)
RetVol	0.047	0.067**	0.022	0.366***	0.481***	0.415***	0.278***	0.344***	0.288***
	(1.44)	(2.05)	(0.65)	(14.56)	(11.03)	(17.29)	(17.27)	(10.03)	(17.57)
InstOwn	0.002	0.002*	0.001	0.000	-0.002*	-0.002	0.002**	0.001	0.002**
	(1.22)	(1.90)	(1.03)	(0.02)	(-1.77)	(-1.47)	(2.39)	(0.92)	(2.24)
EarnPersist	-0.023	0.030	0.087**	0.072**	0.089*	0.095***	0.014	0.004	0.018
	(-0.55)	(1.16)	(2.17)	(2.17)	(1.92)	(3.09)	(0.84)	(0.14)	(1.01)
ReportLag	0.004*	0.000	0.002	0.001	0.003**	0.005**	0.003***	-0.000	0.002**
	(1.66)	(0.20)	(0.89)	(0.71)	(2.25)	(2.53)	(2.78)	(-0.24)	(2.35)

Loss	-0.026	-0.135***	-0.145***	0.176***	0.178***	0.127***	0.078***	0.048**	0.065***
	(-0.48)	(-3.19)	(-3.04)	(4.50)	(4.43)	(3.50)	(3.79)	(1.96)	(3.21)
Firm and Date FE	Included	Included	Included	Included	Included	Included	Included	Included	Included
Adj. R2	0.056	0.030	0.051	0.244	0.262	0.262	0.483	0.629	0.516
N	90,447	210,722	91,960	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), (4) and (7) consists of days where the change in the TVL Pulse score over the previous trading day is less than negative five percent (*ESGNewsNeg*). The sample in columns (2), (5) and (8) consists of days where the change in the TVL Pulse score over the previous trading day is between negative five percent and five percent (*ESGNewsOther*). The sample in columns (3), (6) and (9) consists of days where the change in the TVL Pulse score over the previous trading day is greater than five percent (*ESGNewsPos*). The table reports the results of OLS estimation where the dependent variables are *CAR*, *AbsCAR* 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 7: Investor Reaction to ESG Performance Type on Earnings Announcement Days

	EANews *MissEst*	EANews *MeetEst*	EANews *BeatEst*	EANews *MissEst*	EANews *MeetEst*	EANews *BeatEst*	EANews *MissEst*	EANews *MeetEst*	EANews *BeatEst*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	CAR	*CAR*	*CAR*	*AbsCAR*	*AbsCAR*	*AbsCAR*	*Turnover*	*Turnover*	*Turnover*
(1) LowESG	-0.094	-0.148	0.028	-0.347**	-0.004	-0.073	-0.013	-0.017	0.024
	(-0.46)	(-0.50)	(0.17)	(-2.34)	(-0.02)	(-0.63)	(-0.32)	(-0.38)	(0.83)
(2) HighESG	-0.088	-0.086	-0.125	0.252	0.336*	-0.174	0.056*	0.083**	-0.029
	(-0.41)	(-0.31)	(-0.81)	(1.60)	(1.76)	(-1.58)	(1.70)	(2.09)	(-1.14)
p-value: (1) = (2)	[0.987]	[0.891]	[0.558]	[0.019]	[0.264]	[0.576]	[0.249]	[0.130]	[0.237]
AbsSurp	-48.269***	472.520***	64.115***	32.065***	-64.682	44.201***	6.058***	-44.204***	6.243***
	(-9.86)	(5.59)	(10.50)	(8.63)	(-1.17)	(9.72)	(6.74)	(-4.30)	(4.68)
ESGScore	-0.164	-0.566	0.171	-0.616**	-0.153	-0.215	-0.123*	-0.184**	-0.039
	(-0.40)	(-1.07)	(0.56)	(-2.00)	(-0.45)	(-1.01)	(-1.85)	(-2.41)	(-0.73)
Size	-1.849***	-1.911***	-1.969***	0.237**	0.069	-0.876***	0.289***	0.240***	0.094***
	(-12.86)	(-9.10)	(-16.31)	(2.31)	(0.44)	(-10.78)	(8.42)	(5.60)	(2.88)
M/B	-0.002	0.008	-0.003	0.005	0.007	0.002	0.000	-0.000	0.001
	(-0.24)	(0.65)	(-0.38)	(0.80)	(0.88)	(0.36)	(0.19)	(-0.12)	(0.44)
Leverage	-2.362***	-0.737	-0.722*	1.738***	0.878	0.438	0.879***	0.346**	0.533***
	(-4.48)	(-0.90)	(-1.70)	(4.07)	(1.53)	(1.48)	(6.32)	(2.29)	(4.85)
SalesGrowth	1.928***	3.075***	2.341***	-0.406**	-0.285	1.020***	-0.011	0.027	0.207***
	(8.30)	(7.19)	(10.89)	(-2.31)	(-0.97)	(7.31)	(-0.28)	(0.45)	(6.17)
Analysts	-0.217	0.365	0.481***	0.554***	0.498**	0.557***	0.427***	0.312***	0.355***
	(-1.07)	(1.14)	(2.77)	(3.93)	(2.34)	(4.78)	(9.57)	(6.37)	(8.54)
RetVol	0.244***	0.160	-0.087	0.406***	0.497***	0.463***	0.312***	0.286***	0.355***
	(3.55)	(1.44)	(-1.42)	(8.32)	(6.24)	(11.27)	(20.42)	(14.09)	(22.93)
InstOwn	0.004	0.010	0.003	0.009***	0.011**	0.008***	0.007***	0.006***	0.007***
	(0.98)	(1.53)	(0.92)	(2.93)	(2.46)	(3.12)	(6.99)	(4.69)	(7.10)
EarnPersist	0.215*	-0.070	-0.188*	-0.035	-0.060	-0.002	-0.014	0.001	0.014
	(1.86)	(-0.43)	(-1.85)	(-0.39)	(-0.50)	(-0.04)	(-0.51)	(0.05)	(0.69)
ReportLag	0.027**	0.005	-0.026***	0.003	0.003	-0.006	0.000	0.001	0.003
	(2.36)	(0.30)	(-2.70)	(0.39)	(0.20)	(-0.96)	(0.03)	(0.50)	(1.50)

Loss	-0.891***	-0.733***	-1.717***	0.218**	0.065	-0.331***	-0.017	-0.038	-0.090***
	(-6.18)	(-2.66)	(-12.32)	(2.07)	(0.37)	(-3.53)	(-0.66)	(-0.97)	(-3.18)
Firm and Date FE	Included	Included	Included	Included	Included	Included	Included	Included	Included
Adj. R2	0.099	0.075	0.098	0.224	0.247	0.255	0.593	0.632	0.641
N	28,910	13,788	44,949	28,910	13,788	44,949	28,910	13,788	44,949

The table reports the investor reaction to ESG performance type on earnings announcement days partitioned by the direction of earnings news. The sample in columns (1), (4) and (7) consists of earnings announcement days where firms missed the analysts' consensus forecast (*MissEst*). The sample in columns (2), (5) and (8) 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), 6) and (9) 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*, *AbsCAR* and *Turnover* and the independent variables include ESG performance type and control variables. *LowESG* is an indicator set to one if the firm's TVL Pulse score in the prior month was in the bottom 10% of the CRSP-TVL universe. *HighESG* is an indicator set to one if the firm's TVL Pulse score in the prior month was in the top 10% of the CRSP-TVL universe. 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.