Stock Price Reactions to ESG News: The Role of ESG Ratings and Disagreement

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Abstract

We investigate whether ESG ratings predict future ESG news and the associated market reactions. We find that the consensus rating predicts future news, but its predictive ability diminishes for firms with large disagreement between raters. The relation between news and market reaction is moderated by the consensus rating. In the presence of high disagreement between raters, the relation between news and market reactions weakens while the rating with the most predictive power predicts future stock returns. Overall, while rating disagreement hinders the incorporation of value relevant ESG news into prices, ratings predict future news and proxy for market expectations of future news.

1. INTRODUCTION

Proper allocation of resources in an economy requires institutions that provide information intermediation (Healy and Palepu 2001). As a result, a large amount of resources is spent in producing performance evaluations, such as sell-side analyst forecasts, recommendation ratings, and credit ratings. A central feature of these ratings is that there is an eventual realization that disciplines those evaluations, such as future stock returns in the case of investment recommendations (Barber, Lehavy, McNichols, and Trueman 2001; Clement and Tse 2003; Gleason and Lee 2003), realized earnings in the case of analyst forecasts (Mikhail, Walther, and Willis 1999; Bradshaw, Drake, Myers, and Myers 2012; Hong and Kubik 2003), and default on debt in the case of credit ratings (Becker and Milbourn 2011).

In this paper, we focus on a relatively newer set of performance evaluations: environmental, social and governance (ESG) ratings. These ratings now are sourced by investment managers with trillions of dollars in assets under management influencing portfolio construction and trading. However, due to their multidimensionality and the difficulty in clearly observing the outcomes associated with ESG performance, it is much less clear how one can or should judge their quality. As a result, an emerging stream of literature has focused on the fact that different raters give the same company very different ratings, raising questions about their usefulness (Chatterji, Durand, Levine, and Touboul 2016; Berg, Koelbel and Rigobon 2020).

Against this backdrop, we focus on three key questions. First, do ESG ratings predict *future* ESG news and how rater disagreement affects this predictive ability? Using data from three of the largest ESG rating providers with the most comprehensive coverage (i.e., MSCI, Sustainalytics, and Thomson Reuters), we test the usefulness of ESG ratings by examining whether the latest outstanding consensus (i.e., average across the three) ESG rating predicts future ESG news. We

source a dataset on ESG news from TruValue Labs, which is a data provider that analyzes big data using natural language processing and provides sentiment analysis on how positive or negative the news is. It tracks ESG-related information every day across thousands of companies from a wide variety of non-firm-initiated sources (e.g., reports from analysts, media, advocacy groups, and government regulators) that are likely to generate new information and insights for investors on different ESG topics.

Ex ante, the relation between ESG ratings and news is not clear. For example, as SEC Chairman Jay Clayton recently pointed out, ESG ratings may be noisy and would lead to imprecise investment analysis especially when considered in aggregate.[1] Nonetheless, ESG ratings may predict future ESG news if they somewhat accurately capture a firm's activities and strategies to limit future negative ESG events (i.e., workplace accidents, product safety related recalls, corruption allegations, environmental pollution) and promote positive ESG events (i.e., recognition as a great workplace, launch of environmental solutions products, meeting safety milestones). Our base analysis is conducted on a panel of 31,854 firm-day observations and we find a strong positive predictive relation between ESG ratings and future ESG news. However, we also document that the predictive value of the consensus ESG rating is much weaker in the presence of significant disagreement, consistent with disagreement impairing the predictive value of the consensus rating.

We examine which component of disagreement shapes the above phenomenon by decomposing disagreement into three parts as per Berg et al. (2020), which points out that ESG ratings divergence is shaped by the following: 1) measurement, 2) scope, and 3) weights. We find that the predictive ability of consensus ESG rating diminishes for firms with large disagreements

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[1] Financial Times. May 28, 2020. SEC chair warns of risks tied to ESG ratings.

in measurement among raters. However, we find no such evidence when using the discrepancy of weights or scope as the driver of disagreement.

The second question relates to how consensus rating and disagreement affect stock reactions around the ESG news. We measure stock reactions as the industry-adjusted stock returns on the three-day window between one day before and after the news. Our expectation is that, if ESG news are value relevant, the stock price reaction will be positive (negative) for positive (negative) ESG news. In addition, we expect that the market reaction spread between positive and negative news would be considerably smaller for firms with high ESG ratings. This is because for firms where investors expect positive news, there would be little stock price reaction as the prices already incorporate the positive news. However, we expect that negative news will generate reactions that are similar across the sample of firms with low or high consensus ratings, consistent with negative news having information content even when market participants assess a firm as a poor ESG performer. We find a positive market reaction to positive ESG news and negative reaction to negative news. In addition, the reaction to positive news is associated with 75 basis points higher stock returns than negative news in firms with low average ESG Score. However, for firms with high consensus ESG ratings, we find that the return spread between positive and negative news is only 34 basis points.

Given that past literature highlights that not all ESG issues are financially material for companies in a given industry (Khan, Serafeim and Yoon 2016), we separate our sample to news that is likely to be financially material or not for a given industry. We find that the stock reaction results are generally much larger in the financially material sample.[2] For example, the stock reaction spread between positive and negative news increases to 2.81% for firms with low

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[2] We separate the sample using materiality classifications from the Sustainability Accounting Standards Board (SASB), which is also used by TruValue Labs.

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consensus rating but the spread is 79 basis points for firms with high consensus rating. We also predict and find that for firms with low disagreement, where ratings are more likely to create stronger expectations about future news, the results are further magnified. The stock reaction spread between positive and negative news increases to 3.70% for firms with low consensus rating and 73 basis points for firms with high consensus rating.

In the presence of high disagreement, we find a lack of significant market reactions to news and that the consensus rating does not moderate the relation between news and market reactions. To understand whether disagreement might obscure the incorporation of ratings that contain information about future news in prices, our third analysis is on the predictive power of ratings on future stock returns. First, we document which ratings have the forecasting power over future news in the presence of rating disagreement. Given this relationship, we then examine whether the most predictive rating can be used to predict future stock returns for a sample of companies with high disagreement (i.e., to see whether market participants do not fully incorporate the differential predictability ability in prices). Specifically, we buy the firms with the most predictive rating above the average of the two other ratings and sell the firms with the most predictive rating below the average of the other two. The long (short) portfolio is expected to have more positive (negative) ESG news in the future. We find that the long/short portfolio yields an equal-weighted (value-weighted) annualized alpha of 4.27% (4.00%), suggesting that the discrepancy between the raters acts as an impediment to timely incorporation of the most accurate rating with respect to news into prices.

Our paper contributes to several streams of literature. First, we contribute to the literature that examines the properties of ESG ratings. For example, Chatterji et al. (2016) document lack of agreement across social ratings from six well established raters, Berg et al. (2020) find that the

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source of divergence in ESG ratings is from scope and measurement, and Christensen et al. (2021) finds that greater ESG disclosure exacerbates disagreement across ESG ratings. We add to this stream of literature by providing evidence that ESG ratings can be useful in predicting *future* news. To the best of our knowledge, we are the first to examine this forecasting ability of ESG ratings with respect to ESG news, which is one important ESG outcome. We also find that in the presence of significant disagreement that usefulness declines; however, we provide evidence on how investors may take advantage of this feature to enhance their portfolio decisions when analyzing ESG information.

Moreover, our results suggest that ratings also affect market reactions to ESG news. Thereby, we provide evidence on how ESG ratings create investor expectations about future news and that disagreement is associated with lack of stock price reactions. These findings contribute to a literature that examines market reactions to ESG event, news, or ratings disagreement (Flammer 2013; Dimson, Karakas, and Li 2015; Krueger 2015; Capelle-Blancard and Petit 2019; Grewal, Riedl and Serafeim 2019; Naughton, Wang, and Yeung 2019; Gibson et al. 2020). We add to existing papers such as Krueger (2015) and Capelle-Blancard and Petit (2019) that documented negative market reaction to both positive and negative ESG news. We add by highlighting that the market reacts positively (negatively) to positive (negative) news by examining a much more recent period where investors are likely to view ESG issues differently from an agency perspective and relying on technological advancements that improved data's measurement quality and selection bias. In addition, we add to existing papers such as Gibson et al. (2020) that document market reaction to ESG ratings disagreement by examining monthly return to monthly ESG rating disagreement. We add by better identifying the market reaction to ESG news via using daily data from TruValue Labs (i.e., examine the market reaction to ESG news during a tight three-day

window) and examine this reaction considering the level of ESG performance and also in the presence of disagreement.

Finally, our paper is related to the literature that examines why investors might react to ESG news. One explanation is that investors react because of nonpecuniary reasons (Jones, Jones, and Little 2000; Wether and Chandler 2005; Baker, Bergstresser, Serafeim, and Wurgler 2018). Under this explanation, ESG information is value irrelevant and therefore financially immaterial. In such a case, we expect the reaction to be significant for any ESG issue regardless of its financial materiality, which is contrary to what we find. A different stream of literature argues that ESG news conveys value-relevant information about a firm's future growth, risk, and competitive positioning and that firms that invest in ESG issues that are financially material exhibit superior long term stock return than the firms that do not (Khan et al. 2016). We add to this stream of literature by showing that the short-term market reaction is driven mostly by news that is classified as financially material. Overall, our results are supportive of the view that investors differentiate in their reactions based on whether the news is likely to affect a company's fundamentals, and therefore their reactions are motivated by a financial rather than a nonpecuniary motive.

The remainder of the paper is organized as follows. The next section provides the motivation, literature review, and our hypotheses. Section 3 presents a description of the data and sample. Section 4 presents the research design and results. Section 5 concludes.

2. MOTIVATION, LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT
2.1 Ratings and News

Environmental, social, and governance (ESG) issues in business has been a fast-growing phenomenon and much attention has been paid by companies in recent years. For example, fewer

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than 20 publicly listed companies issued reports that included ESG data in the early 1990s. By 2014, this number had increased to nearly 6,000 (Serafeim 2014). This growing salience of ESG is not unique to companies; it is also prevalent in the asset management industry. For example, UN PRI signatories had only a few hundred billion dollars in AUM in the first few years starting in 2006, but the AUM reached $80 trillion by 2019. Forbes described such massive inflow of capital into ESG as "remarkable" and the Wall Street Journal pointed out that more companies are investing resources in better communicating their ESG efforts and regulators are placing an increasing emphasis on understanding how ESG information flows to the market, seeking to learn how capital-market participants react to this information.[3,4]

A central piece of the ESG information environment is the concept of ESG ratings produced by various raters. These ratings seek to inform decision makers how well a firm is managing its ESG risks and opportunities and are utilized by many investors. Raters use proprietary methodologies, including hundreds of metrics and then weigh those metrics to produce an aggregate rating. Recent evidence suggests that those ratings diverge significantly, leading to severe criticism about their usefulness (Chatterji et al. 2016; Berg et al. 2020). Moreover, the lack of clarity about how one could ex-post assess their validity has likely led to persistence in rater disagreement over time and in fact recent evidence suggests that this disagreement has been increasing over time (Christensen et al. 2021). Against this backdrop, there has been significant interest in understanding the properties of ESG ratings.

Ex ante, the relation between ESG ratings and news is not clear. If ESG ratings appropriately reflect the efforts that a management makes to limit negative ESG events and to promote positive ESG events, then there should be a positive and significant relation between ESG

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[3] Forbes. The Remarkable Rise of ESG. Jul 11, 2018.
[4] WSJ. ESG Funds Draw SEC Scrutiny. Dec 16, 2019.

ratings and more positive news. But if these ratings are plagued with noise and they do not accurately reflect management efforts, they will bear no relationship with how positive vs negative news will be (Chatterji et al. 2016). Our first hypothesis then is:

H1: There is a positive relationship between ESG ratings and more positive future ESG news.

Our second hypothesis suggests the relationship between ESG ratings and news will be moderated by rater disagreement. We expect that in the presence of disagreement, ratings will be less likely to accurately predict future news as the disagreement in ratings reflects different evaluators reaching a different conclusion about the extent to which management efforts are adequate or not. Our second hypothesis is:

H2: The relationship between ESG ratings and more positive future ESG news will be negatively moderated by the level of rater disagreement.

2.2 Ratings, News, and Stock Reactions

There is a rich literature in accounting and finance that examines the market reaction to news. The general finding is that the arrival of new information leads the market to react (Beaver 1968), resolve information asymmetry (Kim and Verrecchia 1994; Tetlock 2010), and increase trading volume (Berry and Howe 1994). Barber and Odean (2008) finds that firms that are in the news are more likely to catch investors' attention than firms that are not, and Dellavigna and Pollet (2009) and Hirshleifer, Lim, and Teoh (2009) find that such investor attention affects stock returns.

More recently, papers have examined how the market reacts to ESG related events. For example, Grewal et al. (2019) examined market reactions around the announcement of the ESG disclosure mandate in the European Union and documented less negative market reaction for firms that have high ESG disclosure. Naughton et al. (2019) found that announcements of ESG activities

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generate positive abnormal returns during periods when investors place a valuation premium on ESG performance, Flammer (2013) found that the market reacts positively to the announcement of eco-friendly initiatives, and Dimson et al. (2015) found positive abnormal returns to successful ESG engagements by investors. Capelle-Blancard and Petit (2019) found negative market reaction to negative ESG news.

This stream of literature suggests that ESG information may be related to shareholder value. The argument is that better ESG performance could translate into value because of operating efficiencies, stronger brand and customer loyalty, and employee engagement (Fombrun and Shanley 1990; Turban and Greening 1997; Freeman, Harrison, and Wicks 2007; Edmans 2011; Eccles, Ioannou, and Serafeim 2014; Lins, Servaes and Tamayo 2017). However, we note that another stream of literature suggests that a firm's ESG efforts are associated with agency costs. In such a case, ESG would mainly enhance managers' reputation at the expense of shareholders (Cheng, Hong, and Shue 2013; Krueger 2015). This would lead to a rise in a firm's costs which would also be a disadvantage in a competitive market (Friedman 1970; Jensen 2002) and lead to negative market reactions to positive ESG news (Krueger 2015; Capelle-Blanchard and Petit 2019). Under this scenario, H_3 below will be rejected:

H_3: More positive ESG news will be associated with more positive stock price reactions to the news.

We expect that the relationship between news and stock price reactions will be moderated by the consensus ESG rating. We know from prior literature examining financial analyst forecast and bond ratings that forecasts shape market expectations, but also that some changes in forecast would be already anticipated and priced in by the market (Fried and Givoly 1982; Goh and Ederington 1993). Similarly, our hypothesis is that ESG ratings might shape market expectations

about future ESG news and thereby have an effect on the associated market reactions. Specifically, we expect that firms with low consensus ESG ratings would react more strongly to positive news than would the firms with high ESG ratings.

As for negative news, our prediction has a nuanced difference vis-à-vis that on the market reaction to positive news (Pinello 2008). Specifically, we predict that negative news would likely generate negative market reaction regardless of how firm ESG efforts are rated. This is because negative news would likely generate public controversies and scrutiny from the media that serve as a watchdog for negative news (Miller 2006; Lee, Hutton, and Shu 2015). These arguments lead to our fourth hypothesis:

H4: For positive ESG news, the relationship between ESG news and stock price reactions will be negatively moderated by ESG ratings.

Next, we make predictions on the role of rater disagreement. We expect that in the presence of high rater disagreement the relationship between ratings and news will be weaker as investors might be confused in interpreting the news. In such a case, rater disagreement will likely mitigate the moderating role of ESG ratings in the presence of disagreement, as the consensus ESG rating is less likely to be a meaningful measure of investor expectations. On the other hand, a market that is more confused about the ESG prospects of the company could lead to a decrease in the predictive ability of ESG ratings. If so, ESG news may be unexpected, and the market would exhibit a smaller reaction to ESG news. To test the above tension, we set forth our fifth hypothesis as follows:

H5: The positive relationship between ESG news and stock price reactions and the moderating role of ESG ratings will be weaker in the presence of rater disagreement.

Recent literature has shown that only a small subset of ESG issues (i.e., those that are identified by the Sustainability Accounting Standards Board (SASB) as financially material) in

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each industry is associated with future stock returns and accounting performance (Khan et al. 2016) and that disclosure around financially material ESG issues is related to more firm-specific information in stock prices (Grewal et al. 2020). If ESG is an investment behavior that uses firm resources, and if investors are motivated by pecuniary rather than nonpecuniary motives in analyzing ESG information, we expect the aforementioned relations to be stronger for ESG issues that are likely to be financially material for companies in each industry. Therefore, we also document all these relations separately for a sample that relates to likely financially material ESG news, as identified by SASB.

2.3 Differential Predictive Ability of ESG Ratings and Stock Returns

Recent literature suggests a low correlation among ESG ratings from different data vendors (e.g., Chatterji et al. 2016; Berg et al. 2020). For example, Chatterji et al. (2016) documents a lack of agreement across firms' social ratings. Berg et al. (2020) points out that the divergence in ESG ratings is due to the difference in how different raters measure, define, and weigh their ESG ratings. These findings reflect the fact that most ESG data vendors exercise subjective discretion in interpreting firm ESG related disclosures. Under such a circumstance, it is plausible that there would be disagreements across vendors on what each of their ESG measures intend to measure and therefore what the outcomes of their ratings should be. If so, we predict that different ESG ratings would have differential predictive ability in predicting future ESG news.[5] This leads us to set forth the following hypothesis:

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[5] We refrain from providing an ex-ante prediction as to which specific rater would have the most predictive ability, because the exact methodology and raw data of different ESG raters are not disclosed (see page 3 of Berg et al. 2020). We also acknowledge that the predictive ability of ESG ratings with respect to future ESG news is just one dimension of the quality of ESG ratings. However, we view the ability of ratings to predict positivity or negativity of ESG news as a core attribute that investors expect when they use ESG ratings because the ratings reflect the commitments that an organization makes in achieving an ESG outcome (Christensen et al. 2021), which in turn would be reflected in the nature of ESG news.

H₆: Different raters will exhibit differential predictive ability of future ESG news.

Given H6, we predict that in the presence of differential predictive ability and the nascent field of ESG investing, market participants do not fully incorporate that differential predictive ability in prices. Christensen et al. (2021) documents that ESG ratings diverge in the presence of more disclosure, suggesting that we are in the early stages of understanding the meaning and content of ESG metrics and disclosures. Against this background, we predict that within a sample of high ESG rating disagreement, a portfolio going long on companies with high (low) scores on the most predictive (less predictive) rating and short on companies with low (high) scores on the most predictive (less predictive) rating would earn positive excess returns.

H₇: The differential predictive ability with respect to future ESG news is only gradually incorporated in market prices.

3. DATA AND SAMPLE

3.1 ESG News Data

We use TruValue Labs Pulse data that track ESG-related information every day across thousands of companies and classify that news as positive or negative. TruValue Labs obtains news from outside the organization including a wide variety of sources such as analyst reports, various media, advocacy groups, and government regulators. TruValue Labs emphasizes that its measures focus on vetted, reputable, and credible sources that are likely to generate new information and therefore insights for investors. To increase transparency and validate the data, the TruValue Labs platform allows a user to track the original source of the articles and events that inform the sentiment analysis for each specific issue. The platform aggregates unstructured data from over 100,000 sources into a continuous stream of ESG data for monitored companies.

Every day, TruValue Labs uses machine learning to find ESG-relevant articles for each company and classifies the news not only as positive versus negative in a binary way, but also regarding degrees of positivity or negativity and whether the news is financially material to the company or not using the SASB classification. Their proprietary system uses natural language processing (NLP) to interpret semantic content and generate analytics scoring data points on performance and also to inform the data users about the number of news articles on which their score is based.[6] For example, Ingersoll Land had positive sentiment following news on the firm's investments to improve waste and hazardous-materials management, materials sourcing, and product safety. In contrast, Facebook had negative sentiment following news on the firm's data-privacy issues, concerns about regulatory pressure, and user rights.

In addition, their process would assign a more negative score to a catastrophic oil spill affecting several workers and communities and a less negative score to a workplace incident leading to a minor injury for one worker. TruValue Labs assigns such scores in a consistent manner based on the semantic content across data points, so that an event such as a catastrophic oil spill and an identical discussion of that event in a textual document would receive the same e sentiment-based score. In essence, and according to TruValue Labs, the change in sentiment score captures *new* news (i.e., sentiment score changes only when there is new news) and the score is specific to visible events about which the news articles are written. TruValue Labs data use a scale of 0 (most negative) to 100 (most positive). An ESG News Score of 50 represents a neutral impact. Scores above 50 indicate positive sentiment, and scores below 50 reflect negative sentiment.

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[6] Our sample uses ESG News scores that have at least five articles, because the algorithm used in TruValue Labs' sentiment analysis requires at least a few articles to be accurate.

3.2 ESG Ratings Data

Our first source of ESG Ratings data is from MSCI ESG Ratings, which is considered the largest ESG data vendor by the investment community (Christensen et al. 2021). Ratings from MSCI ESG Ratings range from 0 (most negative) to 10 (most positive). Our second and third ratings are from Sustainalytics and Thomson Reuters Asset 4. These ratings range from 0 (most negative) to 100 (most positive). We multiply MSCI's ratings by 10 to make them comparable to the two other sources. With data from the three ESG Ratings all now out of 100, we define Average ESG Rating as the average of the most recent ESG Rating from MSCI, Sustainalytics, and Thomson Reuters, with disagreement defined as the standard deviation of these ESG Ratings, following Christensen, Serafeim and Sikochi (2021).

3.3 Other Data

We use Compustat and CRSP to construct the return related and firm level variables. Industry Adjusted Return -1, +1 is the industry (six-digit GICS) adjusted return during the three days around the news. Log(Market Cap) is the log of beginning-of-day market capitalization for a firm on the day the news article is published. MTB is beginning-of-day market value over book value of equity. ROE is defined as net income over average shareholder equity. Leverage is long-term debt plus current debt over the average of total assets of the current and previous year. Capex/PPE is capital expenditure divided by property plant and equipment. SG&A/Sales is selling, general, and administrative expense over sales. Adv Exp/Sales is advertising expense over sales. R&D/Sales is R&D expense over sales. We obtain the five risk factors used in Fama and French (2016) from Kenneth French's website.

3.4 Sample

Table 1 presents the frequency table. Panel A presents the table by year. There are 1,227 observations in 2011, with a gradual increase to 6,516 observations in 2017. We note that 2018 has 3,758 observations, because we obtained TruValue Labs' news data until June 2018. Panel B presents the table by GICS sector. Table 2 presents the descriptive statistics. Panel A shows the summary statistics. Our total sample includes 31,854 unique firm–day observations with ESG news between January 2010 and June 2018. Industry Adjusted Return -1, +1 has mean and median of 0.00. ESG News which ranges from 0 (most negative) to 100 (most positive) has a mean and median of 56.26 and 56.53 suggesting that news is tilted slightly towards the positive side. The average MSCI, Sustainalytics, and Thomson Reuters ESG Ratings are 48.47, 62.22, and 70.70, respectively. Average ESG Rating has a mean of 58.76 and Disagreement has a mean of 10.28. As for other firm level characteristics, an average firm has a log(Market Cap) of 17.90, MTB of 4.89, ROE of 0.20, Leverage of 0.27, Capex/PPE of 0.12, SG&A /Sales of 0.22, Adv Exp/Sales of 0.02, and R&D/Sales of 0.06.

Panel B presents the correlation table. The correlation between ESG News and MSCI ESG Rating, Sustainalytics Rating, Thomson Reuters Rating, and Average ESG Rating are 0.30, 0.25, 0.06, and 0.25, respectively, suggesting that ESG News is positively correlated to ESG Ratings from MSCI and Sustainalytics. The correlation between MSCI ESG Rating and Sustainalytics ESG Rating is 0.47 and that between MSCI ESG Rating and Thomson ESG Rating is 0.30. This is consistent with the literature (e.g., Berg et al. 2020) that points out that ESG Ratings are not highly intercorrelated. The correlations of log(Market Cap) and Average ESG Rating with Disagreement are 0.42 and 0.29, suggesting that larger firms have higher average ESG performance ratings from raters but also are subject to more disagreement between the raters.

4. RESEARCH DESIGN AND RESULTS

4.1 Prediction of News Based on Consensus ESG Rating

We first test whether ESG ratings predict future ESG news and how rater disagreement affects their predictive ability. To do so, we create a firm-day panel and examine whether the latest outstanding consensus ESG rating is associated with future ESG news. Specifically, we use the following empirical specification:[7]

$$ESG\ News_{i,t} = \beta_0 + \beta_1 Normalized\ Average\ ESG\ Rating_{i,t-1} + Control\ Variables + Date\ FE + Industry\ FE + \varepsilon_{i,t}\ (1a)$$

$$ESG\ News_{i,t} = \beta_0 + \beta_1 Normalized\ Average\ ESG\ Rating_{i,t-1} + \beta_2 High\ Disagreement_{i,t-1} + \beta_3 Normalized\ Average\ ESG\ Rating_{i,t-1} * High\ Disagreement_{i,t-1} + Control\ Variables + Date\ FE + Industry\ FE + \varepsilon_{i,t}\ (1b)$$

where ESG News is the ESG news score from TruValue Labs. Average ESG Rating is the average of the most recent ESG ratings from MSCI, Sustainalytics, and Thomson. Normalized Average ESG Rating is the normalized Average ESG Rating (i.e., to have a mean of zero and standard deviation of one for ease of interpretation).[8] We chose the three vendors because they are the most commonly used and by far the most comprehensive in coverage. Disagreement is the standard deviation of these ESG ratings. High Disagreement indicates above average disagreement, also for ease of interpretation. We note that in order to construct Disagreement we require ESG ratings from at least two sources because the standard deviation of one rating cannot be calculated. In our

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[7] We chose the firm-day specification to exploit the richness in ESG news data that often vary at the daily level. We believe that firm-day specification is advantageous in tying the market reaction to a specific ESG news event (see Section 4.2).

[8] According to TruValue Labs, they have a separate ESG ratings dataset called TruValue Labs Insights data and the Pulse dataset used in our paper is an ESG news dataset and not an ESG ratings dataset. However, in order to alleviate the concern that we are not regressing rating on rating, we check if the latest TruValue Labs Insights data is correlated with the volume of articles which triggers the change in the Pulse data. We find that there is very little correlation between the number of articles in the Pulse data and the Insights ESG ratings data (-0.08). This suggests that TruValue Labs' ESG rating and news are two very different constructs.

Electronic copy available at: https://ssrn.com/abstract=3765217

dataset, MSCI has the most comprehensive coverage. Hence, when Disagreement is calculated, it will always have a rating from MSCI.

Control variables include the following variables. Log(Market Cap) is the log of beginning-of-day market capitalization for a firm on the day the news article is published. MTB is beginning-of-day market value over book value of equity. ROE is defined as net income over average shareholder equity. Leverage is long-term debt plus current debt over the average of total assets of the current and previous year. Capex/PPE is capital expenditure divided by property plant and equipment. SG&A/Sales is selling, general, and administrative expense over sales. Adv Exp/Sales is advertising expense over sales. R&D/Sales is R&D expense over sales. We also control for date and industry fixed effects. Standard errors are robust to heteroscedasticity and double clustered at the firm and date level.

We present the results in Table 3. Column 1 presents the result from equation 1a using All News in TruValue Labs as the ESG News. The coefficient estimate on Normalized Average ESG Rating$_{t-1}$ is 2.9083 (t-stats: 7.445). As predicted by H1, this suggests that ESG ratings predict future ESG news. Specifically, a firm with a standard deviation higher average ESG rating than the base group would exhibit 2.91 higher future ESG news score.[9] Column 2 presents the result from equation 1b using All News in TruValue Labs as the ESG News but also includes evidence on the moderating effect of disagreement in ratings. The coefficient estimates on Normalized Average ESG Rating$_{t-1}$, High Disagreement, and Normalized Average ESG Rating$_{t-1}$ * High Disagreement are 3.2671 (t-stats: 8.138), -0.0955 (t-stats: -0.186), and -0.8338 (t-stats: -2.005). Overall, as in

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[9] We separate Average ESG Rating into quintiles and deciles to provide additional evidence on the monotonicity of the relation (see Appendix Table 1). Quintile 2 indicates the firms with Average ESG Ratings in the 2nd lowest quintile and Quintile 5 indicates the firms with Average ESG Ratings in the highest quintile during the year. Decile 2 indicates the firms with Average ESG Ratings in the 2nd lowest decile and Decile 10 indicates firms with Average ESG Ratings in the highest decile during the year. In both specifications, firms with the lowest average ESG rating serve as the benchmark. We observe a monotonic increase in the positivity of the news across the portfolio of firms.

column 1, ESG Rating predicts ESG News. Also, as predicted in H2, this relationship is negatively moderated by the disagreement between raters. Specifically, a firm with a standard deviation higher average ESG rating than the base group would exhibit 0.8338 lower future ESG news score in the case of high disagreement. In sum, we conclude from the two tables that the latest ESG rating predicts ESG news, but the predictive value of the consensus ESG rating is much weaker in the presence of significant disagreement.

In columns 3 and 4, we present results using a subsample of observations that relate to News on ESG issues that are likely to be financially material. We separately report results using that subsample given that they are likely to be more economically significant events. Column 3 presents the result from equation 1a. The coefficient estimate on Normalized Average ESG Rating$_{t-1}$ is 2.4549 (t-stats: 5.186). In column 4, we present the results from equation 1b and the coefficient estimates on Normalized Average ESG Rating$_{t-1}$, High Disagreement, and Normalized Average ESG Rating$_{t-1}$ * High Disagreement are 3.0089 (t-stats: 6.026), 0.7318 (t-stats: 0.987), and -1.1574 (t-stats: -2.237). As in columns 1 and 2, we also find that ESG Rating predicts ESG News and that disagreement moderates this relationship.

Next, we decompose disagreement into three parts. To do so, we rely on the data shared by Berg et al. (2020), which points out that ESG ratings divergence is shaped by the following: 1) measurement, 2) scope, and 3) weights. To examine which component of disagreement shapes our phenomenon, we replace High Disagreement in equation 1b with Driver of Disagreement$_{t-1}$ and present the results in Table 4. We find that the predictive ability of consensus ESG rating diminishes for firms with large disagreements in measurement among raters. However, we find no such evidence when using the discrepancy of weights or scope as the driver of disagreement. We

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note that Berg et al. (2020) use 2014 data and as such this assessment on drivers of disagreement is based only on data of that particular year.

Finally, we also examine whether ESG Ratings predict News on ESG issues that are likely to be financially immaterial. As in the results presented in Table 3, we find that ESG Rating predicts Immaterial ESG News. However, the moderating effect of Disagreement is significantly weaker than the results presented in Table 3 where we used All ESG News and Material ESG News as dependent variables. We present this evidence in Appendix Table 2 Panel A.[10]

4.2 Market Reaction to ESG News Conditional on the Average ESG Rating

In this section, we examine the market reaction to ESG news and the role of consensus ESG rating and disagreement in this relationship. Table 5 Panels A and B present the univariate analysis examining market reaction to ESG news. We use Industry Adjusted Return -1, +1 as the outcome variable. Panel A presents the results using All News from TruValue Labs. Consistent with the prediction in H3, we find that positive (negative) ESG news is associated with positive (negative) stock price reaction. We separate the sample into those with high and low Average ESG Rating and examine their market reaction to positive or negative news.

In the univariate analyses, the results show that the average industry adjusted return for the group of firms with high Average ESG Rating is 0.0738% for positive news, and that for the group of firms with low Average ESG Rating is 0.4159%. As for negative news, the average industry adjusted return for the group of firms with high average ESG Rating is -0.1890%, and that for the group of firms with low Average ESG Rating is -0.2184%. Our findings suggest that when

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[10] For robustness, we also control for ESG disclosure from Bloomberg following Christensen et al. (2021) that found ESG disclosure as a determinant for ESG ratings disagreement. We find similar results but do not use this as the main specification because there is a substantial decrease in sample size. Bloomberg data covers a substantially smaller number of firms than in our sample.

investors expect positive news, there is little stock price reaction as the prices already incorporate this positive news. However, for negative news, reactions are similar across the sample of firms with low or high consensus ESG ratings.

In Panel B, we consider news that is material and examine the role of consensus ESG rating in moderating the relationship between market reaction and news. For positive news, the average industry adjusted return for the group of firms with high Average ESG Rating is 0.0371%, and that for the group of firms with low Average ESG Rating is 1.0580%. For negative news, the average industry adjusted return for group of firms with high average ESG Rating is -0.3430%, and that for the group of firms with low Average ESG Rating is -0.4586%. We note that while the broad message is similar to that considering all ESG news, the results in this panel using material ESG news are significantly stronger than those considering all ESG news. This finding is consistent with the past literature that highlights the importance of financial materiality in ESG issues and suggests that not all ESG issues are financially material for companies in a given industry (Khan et al. 2016; Grewal et al. 2020).

In Panel C, we examine how consensus rating and disagreement affect stock reactions around ESG news. Specifically, we estimate the following regression model:

$$Ind\ Adj\ Ret - 1, +1_{i,t} = \ \beta_0 + \beta_1 Positive\ News_{i,t} + Control\ Variables + \ Date\ FE + Industry\ FE + \varepsilon_{i,t}\ (2a)$$

$$Ind\ Adj\ Ret - 1, +1_{i,t} = \ \beta_0 + \beta_1 Positive\ News_{i,t} + \beta_2 High\ Average\ ESG\ Rating_{i,t-1} + \beta_3 Positive\ News_{i,t} * High\ Average\ ESG\ Rating_{i,t-1} + Control\ Variables + \ Date\ FE + Industry\ FE + \varepsilon_{i,t}\ (2b)$$

where Industry Adjusted Return -1, +1 is the industry-adjusted return during the three-day window around ESG news. Positive (Negative) News indicates TruValue Lab's ESG news score in the highest (lowest) quartile (i.e., ESG new score above (below) 25, respectively). We define an indicator variable as the moderator to facilitate easy interpretation of the moderating effect. High

Average ESG Rating indicates firms that have above average ESG consensus rating. All controls and fixed effects are defined as in equation 1.

Column 1 presents the result from equation 2a. The coefficient estimate on positive news is 0.0054 (t-stat: 4.391). This suggests that stock price reaction to positive ESG news is more positive than that on negative news as shown in Panel A and is consistent with the predictions in H3.[11] In column 2, we present the results from equation 2b. The coefficient estimates on Positive News, High Average ESG Rating$_{t-1}$, and Positive News * High Average ESG Rating$_{t-1}$ are 0.0075 (t-stat: 3.805), 0.0017 (t-stat: 1.497), and -0.0041 (t-stat: -2.005), respectively. This suggests that positive news is associated with 75 basis points higher stock returns than negative news; however, the return spread between positive and negative news is only 34 basis points for firms with high ratings. Overall, this demonstrates that consensus ESG ratings negatively moderate the relationship between ESG news and stock price reaction, confirming the prediction in H4. In columns 3 and 4, we examine equation 2b separately on samples with high and low disagreement in ESG ratings. While we find a positive and statistically significant coefficient on Positive News, we do not find significant coefficients on High Average ESG Rating$_{t-1}$ and Positive News * High Average ESG Rating$_{t-1}$, although the sign on the latter is negative as expected.

In column 5-7, we present the results on Material News only and replicate the results in columns 2-4 that used all ESG News. In column 5, where we replicate column 2, the coefficient estimates on Positive News, High Average ESG Rating$_{t-1}$, and Positive News * High Average ESG Rating$_{t-1}$ are 0.0281 (t-stat: 5.443), 0.0051 (t-stat: 2.063), and -0.0202 (t-stat: -4.125), respectively. This suggests that the stock reaction spread between positive and negative news increases to 2.81%

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[11] We also explore whether market reaction is stronger when there is more investor attention (as proxied by a greater number of news articles written for a particular firm-date). In an untabulated set of results and consistent with the findings in Serafeim and Yoon (2021), we find that the market reaction is stronger when there is more investor attention.

for firms with low consensus rating and the spread is 79 basis points for firms with high consensus rating. In addition, taken together with the results in column 2, the results are much stronger when we consider material ESG news instead of all news.

In columns 6 and 7, we replicate columns 3 and 4 on news that are financially material. For column 6 where we use firms with high disagreement in ESG ratings, we do not find any statistically significant coefficients on Positive News, High Average ESG Rating$_{t-1}$, and Positive News * High Average ESG Rating$_{t-1}$. However, when we consider firms with low disagreement in ESG ratings in column 7, the coefficient estimates on Positive News, High Average ESG Rating$_{t-1}$, and Positive News * High Average ESG Rating$_{t-1}$ are 0.0370 (t-stat: 3.619), 0.0133 (t-stat: 2.142), and -0.0297 (t-stat: -3.456), respectively. This suggests that the stock reaction spread between positive and negative news increases to 3.70% for firms with low consensus rating and 73 basis points for firms with high consensus rating.

In Appendix Table 2 Panel B, we examine financially immaterial news and present the results using equation 2 where we examine the role of ESG Consensus rating in predicting stock returns. In column 1, we find a positive market reaction to immaterial ESG news. However, the magnitude again is substantially smaller to the results using material ESG news. Also, Average ESG Rating does not moderate the relationship between market reaction and news. In columns 2 and 3, we separate the sample based on high and low levels of disagreement. In these specifications, we find neither that the market reacts more to positive ESG news nor that ESG consensus to moderate this relationship. Taken together with our main results, we conclude that our main results are driven by news that is financial material rather than immaterial.

4.3 Pricing of ESG Ratings in the Presence of Disagreement

Our results so far suggest that in the presence of disagreement, there is little market reaction to news and ratings play little role in moderating that relationship. To better understand why this might be the case, we begin by examining whether different raters have differential predictive ability in predicting future ESG news. We first use the following empirical model to examine how the three ratings perform in predicting ESG news.

$$ESG\ News_{i,t} = \beta_0 + \beta_1 MSCI\ ESG\ Rating_{i,t-1} + \beta_2 Sustainalytics\ ESG\ Rating_{i,t-1} + \beta_3 Thomson\ ESG\ Rating_{i,t-1} + Control\ Variables + Date\ FE + Industry\ FE + \varepsilon_{i,t}\ (3)$$

where ESG News is the ESG news score from TruValue Labs. MSCI Rating, Sustainalytics Rating, and Thomson Rating are ESG Ratings from MSCI, Sustainalytics, and Thomson Reuters, respectively. Control variables and fixed effects are as in equations 1 and 2.

Table 6 Panel A presents the results. In columns 1-3, we first consider MSCI, Sustainalytics, and Thomson Ratings separately. The coefficient estimate on MSCI Rating in column 1 is 0.2130 (t-stat: 8.192), the coefficient estimate on Sustainalytics Rating in column 1 is 0.2736 (t-stat: 6.963), and the coefficient estimate on Thomson Rating in column 1 is 0.0819 (t-stat: 1.780). This suggests that the three ESG Ratings predict ESG News when considered separately, but we note that Thomson ESG Rating has the weakest predictive ability.

In column 4, we consider all three ratings in one regression and examine their predictive ability with respect to one another. The coefficient estimates on MSCI ESG Rating, Sustainalytics ESG Rating, and Thomson ESG Rating are 0.1520 (t-stat: 4.161), 0.1339 (t-stat: 3.069), and 0.0177 (t-stat: 0.485). Thomson ESG Rating does not predict ESG News when considered with other ESG Ratings. In columns 5-8, we consider Material ESG News as the dependent variable. The coefficient estimates on MSCI ESG Rating, Sustainalytics ESG Rating, and Thomson ESG Rating are 0.2045 (t-stat: 4.820), 0.0806 (t-stat: 1.638), and -0.0119 (t-stat: -0.347). The overall

message is similar, but we note that in column 8 where we consider all three ratings in one regression, both Sustainalytics and Thomson ESG Rating lose their predictive ability in predicting ESG News when used with MSCI ESG Rating. This result is consistent with H6 that hypothesized a differential predictive ability of different ratings.

We now use the above feature (i.e., MSCI ESG Rating best predicts future ESG News) to predict future stock returns. To do so, we analyze the sample with high rater disagreement, and examine whether following the most predictive rating and creating a long/short portfolio based on that signal would earn abnormal stock returns in the future. Documenting abnormal stock returns could be interpreted as a sign that in the presence of high disagreement, even the most accurate ratings in predicting future news are slowly incorporated into prices.

To do so, we take the firms with high disagreement among the three ratings and form long and short portfolios. Specifically, we buy the firms with MSCI ESG Ratings greater than the average of the two ratings and require MSCI ESG Rating to be above 50 (thereby likely to get positive news), and short the firms with MSCI ESG Rating smaller than the average of the two ratings and require MSCI ESG Rating to be below 50 (and thereby likely to get negative news).[12] The intuition is that we use MSCI ESG Rating as the main signal because it best predicts future ESG news, especially on material ESG issues. If so, firms with high MSCI ESG Rating would exhibit higher future stock returns than firms with low MSCI ESG Rating. We estimate the following specification:

$$R_{i,t} = \alpha + \beta_{MKT}MKT_{i,t} + \beta_{SMB}SMB_{i,t} + \beta_{HML}HML_{i,t} + \beta_{RMW}RMW_{i,t} + \beta_{CMA}CMA_{i,t} + \varepsilon_{i,t} \quad (4)$$

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[12] We restrict the long and short portfolio to have MSCI ESG Rating higher and lower than 50 respectively, because MSCI ESG Rating is constructed around an average score of 50. So, we long (short) portfolio of firms with MSCI ESG Rating above (below) the mean.

where $R_{i,t}$ is the return on portfolio i in month t in excess of the risk free rate. $MKT_{i,t}$ is the market excess return; $SMB_{i,t}$, $HML_{i,t}$, $RMW_{i,t}$, and $CMA_{i,t}$ are size, book-to-market, profitability, and investment factors from Fama and French (2016). α is an intercept that captures the abnormal risk-adjusted return.

The results are presented in Table 6 Panels B and C. Panel B presents the summary statistics of the long and short portfolio. In the short portfolio, average MSCI ESG Rating (36.28) is significantly lower than 66.00, which is the average between Sustainalytics and Thomson ESG Rating. In the long portfolio, average MSCI ESG Rating is 59.08, which is higher than the average between Sustainalytics and Thomson ESG Rating of 56.56. Panel C presents the result from the long/short portfolio. When using equal-weighted and value-weighted approaches, the long/short portfolio generates an annualized alpha of 4.27% and 4.00%, respectively.

For robustness, we also replicate the results presented in Table 6 Panels B and C using normalized ESG ratings. We present this evidence in Appendix Table 3 Panels A and B. We find that the long/short portfolio generates an annualized alpha of 3.35% and 3.22% when using equal-weighted and value-weighted approaches, respectively. Taken together, our results are consistent with the notions presented in H7 and suggest that future stock returns can be predicted using the most predictive ESG rating in the presence of high disagreement.[13]

5. CONCLUSION

In this paper, we focus on a relatively newer set of performance evaluations: environmental, social and governance (ESG) ratings. These ratings are sourced by investment

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[13] Instead of holding the portfolio for 12 months, we try different time windows (i.e., 24 and 36 months) to examine how long it takes for the disagreement to be resolved. Interestingly, we find that it takes three years for the ratings to be integrated into prices. A potential explanation is that we are still in the early stages of understanding the information content in ESG metrics and as a result such information acquisition and integration happen slowly over time.

managers with trillions of dollars in assets under management influencing portfolio construction and trading. However, unlike analyst forecasts or credit ratings, it is much less clear how one can or should judge the quality of ESG ratings due to their multidimensionality and the difficulty of observing clear realizations of the outcomes.

We investigate the predictive ability of corporate ESG ratings on future ESG news. Our findings can be summarized as follows. First, we find that consensus ESG rating predicts future ESG news but this relationship is moderated by the extent of the disagreement between raters. Second, we find a positive market reaction to positive ESG news and negative reaction to negative news. Interestingly, we find that the market reaction to positive news is smaller for firms with high ESG rating and interpret this finding as positive news already being reflected in stock price. We also find that for firms with low disagreement, where ratings are more likely to create stronger expectations about future news, stock price reaction results are further magnified. Third, we find that ESG ratings from different providers have differential predictive ability and that rating from the provider with the most predictive power predicts future stock returns in the presence of high ratings disagreement.

Our findings suggest that ratings proxy for market expectations of future performance and predict future news and stock returns despite rating disagreement hindering their usefulness. We acknowledge that the predictive ability of ESG ratings with respect to future ESG news is just one dimension that measures the quality of ESG ratings. However, we view the ability of ratings to predict positivity or negativity of ESG news as a core attribute that investors expect when they use ESG ratings because the ratings reflect the commitments that an organization makes in achieving an ESG outcome (Christensen et al. 2021), which in turn would be reflected in the nature of ESG

news. Nonetheless, we believe that our findings could serve as a base for future research that may

lead to further understanding of the qualitative properties of ESG ratings.

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Table 1 Frequency Table

This table presents the frequency by year and GICS sector. It contains the 31,854 firm day observations used in this paper.

Panel A By Year

Year	N
2010	1,227
2011	1,869
2012	1,845
2013	2,303
2014	3,069
2015	5,799
2016	5,468
2017	6,516
2018	3,758
Total	31,854

Panel B By Sector

Industry	N
Energy	1,498
Materials	1,505
Industrials	2,644
Consumer Discretionary	5,632
Consumer Staples	4,078
Health Care	3,601
Financials	1,729
Information Technology	6,253
Communication Services	3,319
Utilities	1,504
Real Estate	91
Total	31,854

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Table 2 Descriptive Statistics

This table presents the descriptive statistics. Industry Adj Return -1, +1 is the industry-adjusted return during the three-day window around ESG news. ESG News is ESG news score from TruValue Labs. MSCI, Sustainalytics, and Thomson Reuters ESG Ratings are the latest ratings from MSCI, Sustainalytics, and Thomson, respectively. Average ESG Rating is the average of the most recent ESG Ratings from MSCI, Sustainalytics, and Thomson. Disagreement is the standard deviation of the three ESG Ratings when all three ratings are available (or two ESG Ratings when only two are available). Log(Market Cap) is the log of beginning-of-day market capitalization for a firm on the day the news article is published. MTB is beginning-of-day market value over book value of equity. ROE is defined as net income over average shareholder equity. Leverage is long-term debt plus current debt over the average of total assets of the current and previous years. Capex/PPE is capital expenditure divided by property plant and equipment. SG&A/Sales is selling, general, and administrative expense over sales. Adv Exp/Sales is advertising expense over sales. R&D/Sales is R&D expense over sales.

Panel A Summary Statistics

	N	Mean	St. Dev	p25	Median	p75
Industry Adjusted Return -1, +1	31,854	0.00	0.02	-0.01	0.00	0.01
ESG News	31,854	56.26	11.54	48.92	56.53	63.66
MSCI ESG Rating	31,854	48.47	12.68	39.00	47.00	56.70
Sustainalytics ESG Rating	30,697	62.22	8.88	56.00	63.00	68.00
Thomson Reuters ESG Rating	23,220	70.70	16.36	61.91	74.56	82.84
Average ESG Rating	31,854	58.76	10.33	51.28	58.75	65.50
Disagreement	31,854	10.28	5.02	6.50	10.41	13.54
log(Market Cap)	31,854	17.90	1.47	16.98	18.17	19.07
MTB	31,854	4.89	7.71	1.59	3.04	5.83
ROE	31,854	0.20	0.38	0.09	0.17	0.28
Leverage	31,854	0.27	0.16	0.16	0.26	0.37
Capex/PPE	31,854	0.12	0.09	0.06	0.09	0.15
SG&A/Sales	31,854	0.22	0.17	0.07	0.21	0.35
Adv Exp/Sales	31,854	0.02	0.02	0.00	0.01	0.03
R&D/Sales	31,854	0.06	0.09	0.00	0.02	0.12

Panel B Correlation Table

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Industry Adjusted Return -1, +1	1.00														
2	ESG News	0.04	1.00													
3	MSCI ESG Rating	0.00	0.30	1.00												
4	Sustainalytics ESG Rating	0.00	0.25	0.47	1.00											
5	Thomson Reuters ESG Rating	-0.01	0.06	0.30	0.60	1.00										
6	Average ESG Rating	0.00	0.25	0.74	0.78	0.85	1.00									
7	Disagreement	0.00	-0.15	-0.41	0.11	0.45	0.10	1.00								
8	log(Market Cap)	-0.02	-0.16	0.14	0.27	0.60	0.42	0.29	1.00							
9	MTB	0.00	0.00	0.01	0.01	0.00	0.01	0.00	0.00	1.00						
10	ROE	-0.03	0.04	0.08	0.13	0.21	0.17	0.05	0.13	-0.05	1.00					
11	Leverage	0.00	0.04	-0.04	0.07	0.00	-0.02	0.00	-0.12	0.00	-0.01	1.00				
12	Capex/PPE	0.00	-0.05	0.08	-0.20	-0.35	-0.16	-0.24	0.06	0.00	-0.04	-0.27	1.00			
13	SG&A/Sales	0.01	0.00	0.00	0.01	-0.02	-0.01	-0.01	-0.01	0.00	-0.01	-0.01	0.03	1.00		
14	Adv Exp/Sales	0.00	0.00	0.03	0.04	-0.05	0.00	-0.06	0.07	0.02	0.00	0.06	0.21	0.00	1.00	
15	R&D/Sales	0.09	0.03	-0.01	-0.03	-0.09	-0.07	-0.06	-0.11	-0.01	-0.09	0.00	0.06	0.22	0.00	1.00

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Table 3 Prediction of News Based on the Most Recent ESG Rating

This table presents results from equation (1). ESG News is the ESG news score from TruValue Labs. Average ESG Rating is the average of the most recent ESG Ratings from MSCI, Sustainalytics, and Thomson. Normalized Average ESG Rating is normalized Average ESG Rating, such that it has a mean of 0 and a standard deviation of 1 for ease of interpretation. Disagreement is the standard deviation of the three ESG Ratings when there are all three ratings available (or two ESG Ratings when only two are available). High Disagreement indicates above average disagreement. Control variables include the following: Log(Market Cap) is the log of beginning-of-day market capitalization for a firm on the day the news article is published. MTB is beginning-of-day market value over book value of equity. ROE is defined as net income over average shareholder equity. Leverage is long-term debt plus current debt over the average of total assets of the current and previous years. Capex/PPE is capital expenditure divided by property plant and equipment. SG&A/Sales is selling, general, and administrative expense over sales. Adv Exp/Sales is advertising expense over sales. R&D/Sales is R&D expense over sales. All models include industry and date fixed effects. Standard errors are robust to heteroscedasticity and double clustered at the firm and date level. ***, **, * are statistically significant at the 1, 5, and 10% levels, respectively.

	ESG News			
	(1)	(2)	(3)	(4)
	All News		Material News	
Normalized Average ESG Rating$_{t-1}$	2.9083***	3.2671***	2.4549***	3.0089***
	[7.445]	[8.138]	[5.186]	[6.026]
High Disagreement		0.0955		0.7318
		[0.186]		[0.987]
Normalized Average ESG Rating$_{t-1}$*High Disagreement		-0.8338**		-1.1574**
		[-2.005]		[-2.237]
Controls		Yes		
F.E		Industry & Date		
N	31,854	31,854	10,806	10,806
R-squared	0.316	0.317	0.453	0.455

Table 4 Prediction of News Based on the Most Recent ESG Rating- Decomposing Disagreement

This table decomposes the disagreement in Table 3. ESG News is the ESG news score from TruValue Labs. Average ESG Rating is the average of the most recent ESG Ratings from MSCI, Sustainalytics, and Thomson. Normalized Average ESG Rating is normalized Average ESG Rating, such that it has a mean of 0 and a standard deviation of 1 for ease of interpretation. Driver of Disagreement uses one of three drivers identified in Berg et al. (2020): 1) Weights, 2) Scope, or 3) Measurement. Control variables include the following: Log(Market Cap) is the log of beginning-of-day market capitalization for a firm on the day the news article is published. MTB is beginning-of-day market value over book value of equity. ROE is defined as net income over average shareholder equity. Leverage is long-term debt plus current debt over the average of total assets of the current and previous year. Capex/PPE is capital expenditure divided by property plant and equipment. SG&A/Sales is selling, general, and administrative expense over sales. Adv Exp/Sales is advertising expense over sales. R&D/Sales is R&D expense over sales. All models include industry and date fixed effects. Standard errors are robust to heteroscedasticity and double clustered at the firm and date level. ***, **, * are statistically significant at the 1, 5, and 10% levels, respectively.

	ESG News					
	(1)	(2)	(3)	(4)	(5)	(6)
	All News			Material News		
	Weights	Scope	Measurement	Weights	Scope	Measurement
Normalized Average ESG Rating$_{t-1}$	4.0741***	4.9894***	5.7650***	2.2046*	3.9324***	3.6587**
	[4.195]	[5.418]	[5.076]	[1.932]	[3.182]	[2.458]
Driver of Disagreement	-5.4637***	-0.4081	-0.2253	-6.0682**	-0.9642	-0.5717
	[-2.862]	[-0.302]	[-0.130]	[-1.998]	[-0.509]	[-0.255]
Normalized Average ESG Rating$_{t-1}$*Driver of	0.9661	-0.7176	-3.2020*	2.8589*	-0.3507	-0.3096
Disagreement	[0.699]	[-0.777]	[-1.812]	[1.801]	[-0.379]	[-0.138]
Controls			Yes			
F.E			Industry & Date			
N	7,349	7,349	7,349	2,528	2,528	2,528
R-squared	0.395	0.388	0.390	0.544	0.536	0.536

Table 5 Market Reaction to ESG News Conditional on the Average ESG Rating

Panels A and B present the univariate analysis and panel C presents the multivariate results from equation (2). Industry Adj Return -1, +1 is the industry-adjusted return during the three day window around ESG news. Positive (Negative) News indicates TruValue Lab's ESG news score above 75 (below 25). Average ESG Rating is the average of the most recent ESG ratings from MSCI, Sustainalytics, and Thomson. Disagreement is the standard deviation of the three ESG Ratings when all three ratings are available (or two ESG Ratings when only two are available). Hi Average ESG Rating and Hi Disagreement indicate firms that are above average in these dimension. Control variables include the following: Log(Market Cap) is the log of beginning-of-day market capitalization for a firm on the day the news article is published. MTB is beginning-of-day market value over book value of equity. ROE is defined as net income over average shareholder equity. Leverage is long-term debt plus current debt over the average of total assets of the current and previous years. Capex/PPE is capital expenditure divided by property plant and equipment. SG&A/Sales is selling, general, and administrative expense over sales. Adv Exp/Sales is advertising expense over sales. R&D/Sales is R&D expense over sales. All models include industry and date fixed effects. Standard errors are robust to heteroscedasticity and double clustered at the firm and date level. ***, **, * are statistically significant at the 1, 5, and 10% levels, respectively.

Panel A. Univariate Analysis- All News

	High Average ESG Rating		Low Average ESG Rating	
	N	Industry Adj Return -1, +1	N	Industry Adj Return -1, +1
Positive News	4,006	0.0738%	2,365	0.4159%
Negative News	2,379	-0.1890%	3,991	-0.2184%

Panel B. Univariate Analysis- Material News

	High Average ESG Rating		Low Average ESG Rating	
	N	Industry Adj Return -1, +1	N	Industry Adj Return -1, +1
Positive News	1,340	0.0371%	821	1.0580%
Negative News	798	-0.3430%	1,363	-0.4588%

Panel C. Multivariate Analysis- Market Reaction to ESG News Conditional on ESG Rating

	Industry Adjusted Return -1, +1						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Base	Base/Interact	Hi Disagree Only	Lo Disagree Only	Material News Only	Material News Only	
						Hi Disagree Only	Lo Disagree Only
Positive News	0.0054***	0.0075***	0.0042*	0.0086***	0.0281***	0.0104**	0.0370***
	[4.391]	[3.805]	[1.836]	[2.587]	[5.443]	[2.003]	[3.619]
Hi Avg ESG Rating$_{t-1}$		0.0017	0.0007	-0.0005	0.0051**	-0.0055*	0.0133**
		[1.497]	[0.424]	[-0.198]	[2.063]	[-1.841]	[2.142]
Positive News * Hi Avg ESG Rating$_{t-1}$		-0.0041**	-0.0004	-0.0042	-0.0202***	-0.0027	-0.0297***
		[-2.005]	[-0.143]	[-1.195]	[-4.125]	[-0.470]	[-3.456]
log(Market Cap)	-0.0007	-0.0006	-0.0004	-0.0007	0.0012	0.0007	0.0033
	[-1.064]	[-0.903]	[-0.367]	[-0.647]	[0.977]	[0.328]	[1.546]
MTB	-0.0000	-0.0000	0.0000	-0.0001	-0.0001	0.0001	-0.0001
	[-0.366]	[-0.436]	[1.422]	[-1.213]	[-1.226]	[0.903]	[-1.069]
ROE	-0.0024	-0.0024	-0.0060	-0.0005	-0.0024	-0.0080	0.0003
	[-1.353]	[-1.369]	[-1.455]	[-0.421]	[-0.852]	[-1.228]	[0.078]
Leverage	0.0033	0.0034	0.0219*	-0.0051	-0.0087	-0.0023	-0.0213
	[0.537]	[0.559]	[1.838]	[-0.682]	[-0.789]	[-0.135]	[-1.329]
Capex/PPE	-0.0009	-0.0003	0.0217*	-0.0094	0.0401	0.0296	0.0603
	[-0.063]	[-0.024]	[1.668]	[-0.496]	[1.365]	[1.123]	[1.455]
SG&A/Sales	-0.0000	-0.0000	0.0065	-0.0000	-0.0000	-0.0189	-0.0000
	[-1.022]	[-0.961]	[0.466]	[-0.604]	[-1.445]	[-0.654]	[-0.644]
Adv Exp/Sales	0.0432	0.0447	0.0218	0.0225	0.2184***	0.2588*	0.1678*
	[1.389]	[1.435]	[0.398]	[0.684]	[3.017]	[1.871]	[1.671]
R&D/Sales	0.0011***	0.0011***	0.0024	0.0010**	0.0012***	-0.0199	0.0013**
	[2.807]	[2.790]	[0.103]	[2.302]	[2.965]	[-0.552]	[2.474]
FE				Industry & Date			
Observations	12,741	12,741	6,120	6,621	4,322	2,089	2,233
R-squared	0.172	0.173	0.297	0.276	0.396	0.600	0.597

Table 6 Prediction of News Based on the Most Recent ESG Rating

Panel A presents results from equation (3). ESG News is the ESG news score from TruValue Labs. ESG Ratings are the latest ratings from MSCI, Sustainalytics, and Thomson. Control variables include the following: Log(Market Cap) is the log of beginning-of-day market capitalization for a firm on the day the news article is published. MTB is beginning-of-day market value over book value of equity. ROE is defined as net income over average shareholder equity. Leverage is long-term debt plus current debt over the average of total assets of the current and previous year. Capex/PPE is capital expenditure divided by property plant and equipment. SG&A/Sales is selling, general, and administrative expense over sales. Adv Exp/Sales is advertising expense over sales. R&D/Sales is R&D expense over sales. All models include industry and date fixed effects. Standard errors are robust to heteroscedasticity and double clustered at the firm and date level. ***, **, * are statistically significant at the 1, 5, and 10% levels, respectively.

Panel A. Using Individual ESG Ratings from Each Vendors

	ESG News				Material ESG News			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
MSCI ESG Rating$_{t-1}$	0.2130***			0.1520***	0.2344***			0.2045***
	[8.192]			[4.161]	[6.593]			[4.820]
Sustainalytics ESG Rating$_{t-1}$		0.2736***		0.1339***		0.2231***		0.0806
		[6.963]		[3.069]		[4.377]		[1.638]
Thomson ESG Rating$_{t-1}$			0.0819*	0.0177			0.0456	-0.0119
			[1.780]	[0.485]			[0.966]	[-0.347]
log(Market Cap)	-1.1095***	-1.3146***	-1.7957***	-1.4885***	-1.2550***	-1.4307***	-1.6122***	-1.2884***
	[-5.665]	[-5.150]	[-4.619]	[-4.307]	[-4.745]	[-4.167]	[-3.820]	[-3.302]
MTB	-0.0004***	-0.0004**	-0.0004**	-0.0004***	-0.0039	-0.0103	0.0134	0.0084
	[-3.095]	[-2.405]	[-2.318]	[-3.478]	[-0.492]	[-1.048]	[1.346]	[0.931]
ROE	0.1088	-0.1233	-0.3865	-0.2510	0.7753*	0.5720	-0.0791	0.8848
	[0.324]	[-0.344]	[-1.060]	[-0.719]	[1.687]	[1.075]	[-0.124]	[1.371]
Leverage	0.2697	-0.2168	0.8312	2.4328	2.1598	1.3358	2.5763	3.8996
	[0.107]	[-0.088]	[0.341]	[1.025]	[0.682]	[0.399]	[0.754]	[1.108]
Capex/PPE	-10.9038**	-8.1894	-11.6734	-11.8065*	-10.2442**	-13.8563**	-11.6574**	-11.3830**
	[-2.237]	[-1.208]	[-1.604]	[-1.790]	[-2.233]	[-2.075]	[-2.155]	[-2.066]
SG&A/Sales	-0.0100***	1.3503	-0.0083***	8.3395***	-0.0102***	0.4676	-0.0094***	8.6981**
	[-5.352]	[0.935]	[-4.099]	[2.701]	[-5.423]	[0.513]	[-4.682]	[2.206]
Adv Exp/Sales	-6.6131	-10.0501	-21.0643*	-29.3844**	-10.6480	-24.2973	-23.7584	-52.3401**
	[-0.630]	[-0.794]	[-1.733]	[-2.201]	[-0.796]	[-1.283]	[-1.368]	[-2.384]
R&D/Sales	0.0555	0.1908	0.0222	0.1303	0.0578	0.3029	0.0295	0.1923
	[0.880]	[0.735]	[0.339]	[0.273]	[0.793]	[1.201]	[0.401]	[0.410]
FE				Industry & Date				
Observations	31,854	30,697	23,220	22,063	10,806	10,469	7,458	7,121
R-squared	0.319	0.328	0.330	0.379	0.461	0.465	0.499	0.554

Panel B. Summary Stats of Long/Short Portfolios that Use Disagreements in ESG Ratings

Panel B presents the summary statistics and panel C reports alphas, factor loadings, and t-statistics from equation (4) where we restrict the sample to firms with high disagreement in ratings and use monthly calendar-time Fama-French five factor regressions for equal- and value-weighted portfolios. ESG Ratings are the latest Ratings from MSCI, Sustainalytics, and Thomson. Average(Sustainalytics, Thomson) is the average of Sustainalytics and Thomson ESG Ratings. Long Portfolio includes firms with MSCI rating greater than 50 and also greater than the average of the other two ratings. Short Portfolio includes firms with MSCI rating smaller than 50 and also smaller than the average of the other two ratings. The regressions are estimated from January 2011 to December 2019. Market is the market excess return; SMB, HML, RMW, and CMA are size, book to market, profitability, and investment factors from Fama and French (2016). ***, **, * are statistically significant at the 1, 5, and 10% levels, respectively.

Short Portfolio	Mean	St. Dev	Min	0.25	Median	0.75	Max
MSCI ESG Rating	36.28	9.33	0.00	30.00	38.00	44.00	49.80
Sustainalytics ESG Rating	58.20	7.38	38.00	53.00	58.00	64.00	82.00
Thomson ESG Rating	73.80	16.55	13.74	66.57	77.83	86.47	95.39
Average (Sustainalytics, Thomson)	66.00	10.57	30.69	60.00	67.90	73.91	87.65

Long Portfolio	Mean	St. Dev	Min	0.25	Median	0.75	Max
MSCI ESG Rating	59.08	7.84	50.20	53.00	56.00	63.00	94.50
Sustainalytics ESG Rating	58.19	10.62	38.00	49.00	57.00	66.00	88.00
Thomson ESG Rating	44.90	27.43	6.11	26.01	31.48	78.37	95.61
Average (Sustainalytics, Thomson)	56.56	17.45	27.48	39.95	52.88	73.66	89.38

Panel C. Predicting Future Stock Returns Using Disagreements in ESG Ratings

	Equal-Weighted		Value-Weighted	
	(1)		(2)	
	Long/Short		Long/Short	
Parameter	Estimate	t	Estimate	t
Intercept	0.0035	2.46	0.0033	2.35
Market	-0.1334	-3.13	-0.1319	-3.10
SMB	0.0807	1.03	0.0833	1.09
HML	-0.0942	-1.10	-0.0963	-1.15
RMW	-0.3705	-3.03	-0.3623	-3.03
CMA	-0.0423	-0.43	-0.0336	-0.34
N	108		108	
Annualized Alpha	4.27%		4.00%	

Appendix

Table 1 Prediction of News Based on the Most Recent ESG Rating Using Quintile and Decile

This table presents results from equation (1). ESG News is the ESG news score from TruValue Labs. Average ESG Rating is the average of the most recent ESG ratings from MSCI, Sustainalytics, and Thomson. We cut the sample into quintile and deciles using the average ESG rating. Control variables include the following: Log(Market Cap) is the log of beginning-of-day market capitalization for a firm on the day the news article is published. MTB is beginning-of-day market value over book value of equity. ROE is defined as net income over average shareholder equity. Leverage is long-term debt plus current debt over the average of total assets of the current and previous year. Capex/PPE is capital expenditure divided by property plant and equipment. SG&A/Sales is selling, general, and administrative expense over sales. Adv Exp/Sales is advertising expense over sales. R&D/Sales is R&D expense over sales. All models include industry and date fixed effects. Standard errors are robust to heteroscedasticity and double clustered at the firm and date level. ***, **, * are statistically significant at the 1, 5, and 10% levels, respectively.

	ESG News	
Avg ESG Rating$_{t-1}$	(1)	(2)
Quintile 2	3.1534***	
	[3.598]	
Quintile 3	3.6344***	
	[3.778]	
Quintile 4	5.2014***	
	[5.996]	
Quintile 5	7.4100***	
	[6.757]	
Decile 2		2.2505**
		[2.335]
Decile 3		4.6319***
		[3.592]
Decile 4		4.3822***
		[3.567]
Decile 5		4.9497***
		[3.521]
Decile 6		5.0948***
		[4.474]
Decile 7		6.5123***
		[5.809]
Decile 8		6.6853***
		[6.002]
Decile 9		8.4838***
		[6.681]
Decile 10		9.4006***
		[6.627]
Controls	Yes	
F.E	Industry & Date	
N	31,854	31,854
R-squared	0.315	0.317

Table 2 Replication of Table 3 and 4 Using Immaterial News

Panels A and B present results from equations (1) and (2) using immaterial ESG News. ESG News is the ESG news score from TruValue Labs. Average ESG Rating is the average of the most recent ESG ratings from MSCI, Sustainalytics, and Thomson. Normalized Average ESG Rating is normalized Average ESG Rating, such that it has a mean of 0 and a standard deviation of 1 for ease of interpretation. Disagreement is the standard deviation of the three ESG ratings when all three ratings are available (or two ESG ratings when only two are available). High Disagreement indicates above average disagreement. Industry Adj Return - 1, +1 is the industry-adjusted return during the three-day window around ESG news. Positive (Negative) News indicates TruValue Lab's ESG news score above 75 (below 25). Average ESG Rating is the average of the most recent ESG Ratings from MSCI, Sustainalytics, and Thomson. Control variables include the following: Log(Market Cap) is the log of beginning-of-day market capitalization for a firm on the day the news article is published. MTB is beginning-of-day market value over book value of equity. ROE is defined as net income over average shareholder equity. Leverage is long-term debt plus current debt over the average of total assets of the current and previous year. Capex/PPE is capital expenditure divided by property plant and equipment. SG&A/Sales is selling, general, and administrative expense over sales. Adv Exp/Sales is advertising expense over sales. R&D/Sales is R&D expense over sales. All models include industry and date fixed effects. Standard errors are robust to heteroscedasticity and double clustered at the firm and date level. ***, **, * are statistically significant at the 1, 5, and 10% levels, respectively.

Panel A. Prediction of News Based on the Most Recent ESG Rating

	Immaterial ESG News	
	(1)	(2)
Normalized Average ESG Rating$_{t-1}$	3.1266***	3.2375***
	[7.842]	[7.769]
High Disagreement		-0.3675
		[-0.771]
Normalized Average ESG Rating$_{t-1}$*High Disagreement		-0.2758
		[-0.657]
Controls	Yes	
F.E	Industry & Date	
N	21,048	21,048
R-squared	0.323	0.324

Panel B. Market Reaction to ESG News Conditional on ESG Rating

	Industry Adjusted Return -1, +1		
	(1)	(2)	(3)
	Immaterial ESG News		
		Hi Disagree Only	Lo Disagree Only
Positive News	0.0032**	-0.0005	0.0038
	[1.969]	[-0.190]	[1.394]
Hi Avg ESG Rating$_{t-1}$	-0.0010	0.0017	-0.0013
	[-0.478]	[0.617]	[-0.340]
Positive News * Hi Avg ESG Rating$_{t-1}$	0.0012	0.0023	-0.0016
	[0.879]	[1.344]	[-0.467]
Controls		Yes	
FE		Industry & Date	
Observations	8,418	4,117	4,301
R-squared	0.249	0.393	0.390

Table 3 Replication of Table 6B and 6C Using Normalized ESG Scores

Panel A presents the summary statistics and panel B reports alphas, factor loadings, and t-statistics from equation (4) where we restrict the sample to firms with high disagreement in normalized ratings and use monthly calendar-time Fama-French five factor regressions for equal- and value-weighted portfolios. ESG Ratings are the latest normalized ratings from MSCI, Sustainalytics, and Thomson. Average(Sustainalytics, Thomson) is the average of normalized Sustainalytics and Thomson ESG Ratings. Long Portfolio includes firms with normalized MSCI rating greater than 0 and also greater than the average of the other two ratings. Short Portfolio includes firms with normalized MSCI rating smaller than 0 and also smaller than the average of the other two ratings. The regressions are estimated from January 2011 to December 2019. Market is the market excess return; SMB, HML, RMW, and CMA are size, book to market, profitability, and investment factors from Fama and French (2016). ***, **, * are statistically significant at the 1, 5, and 10% levels, respectively.

Panel A. Summary Stats of Long/Short Portfolios that Use Disagreements in Normalized ESG Ratings

Short Portfolio	Mean	St. Dev	Min	0.25	Median	0.75	Max
MSCI ESG Score	-1.13	0.69	-3.98	-1.61	-1.03	-0.59	-0.01
Sustainalytics ESG Score	0.03	0.95	-2.50	-0.74	-0.04	0.78	3.12
Thomson ESG Score	0.55	0.86	-1.55	-0.18	0.74	1.29	1.80
Average (Sustainalytics, Thomson)	0.29	0.81	-1.62	-0.37	0.34	0.93	2.34

Long Portfolio	Mean	St. Dev	Min	0.25	Median	0.75	Max
MSCI ESG Score	0.78	0.68	0.00	0.26	0.60	1.11	4.03
Sustainalytics ESG Score	-0.35	1.04	-2.03	-0.98	-0.74	-0.04	3.83
Thomson ESG Score	-0.48	0.84	-1.86	-1.05	-0.75	-0.14	1.81
Average (Sustainalytics, Thomson)	-0.35	0.67	-1.55	-0.82	-0.48	0.03	2.64

Panel B. Predicting Future Stock Returns Using Disagreements in Normalized ESG Ratings

	Equal-Weighted		Value-Weighted	
	(1)		(2)	
	Long/Short		Long/Short	
Parameter	Estimate	t	Estimate	t
Intercept	0.0027	2.14	0.0026	2.13
Market	-0.0342	-1.03	-0.0319	-0.97
SMB	0.1502	2.70	0.1490	2.78
HML	-0.1099	-1.80	-0.1040	-1.75
RMW	-0.3095	-3.20	-0.3127	-3.39
CMA	-0.1177	-1.34	-0.1129	-1.33
N	108		108	
Annualized Alpha	3.35%		3.22%	