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**The Real Effect of ESG Rating Agencies**

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# The Real Effect of ESG Rating Agencies<sup>\*</sup>

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## Abstract

We examine the effect of coverage by ESG rating agencies on corporate policy. To control for the selection in coverage, we construct a sample of firms with existing ESG ratings from some agencies and study the marginal effect of the introduction of a new coverage for a firm relative to firms that did not receive the additional coverage. We find that when firm ESG coverage intensifies, its ESG ratings improve, its toxic emissions decline, and its board diversity increases. More covered firms disclose more ESG information and engage more in the acquisitions of targets with strong ESG performance. ESG coverage increases firm institutional ownership and valuation ratios. Our results suggest that ESG rating agencies exhibit material impact on firms.

*Keywords:* ESG, ESG rating agencies, corporate board, mergers and acquisitions, institutional ownership

*JEL classification:* G14, G40, K42

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## 1. Introduction

Fueled by deepening environmental problems and recent corporate governance scandals, the demand for information on the environmental, social, and governance (ESG) performance of firms has been increasing rapidly in recent years. In response to this demand, firms, media outlets, and independent analysts started providing ESG information to the market. However, the multidimensional nature of ESG and the lack of well-established disclosure standards substantially decrease the usability of this information. As a result, private entities (agencies) started aggregating ESG information into standardized ratings. In this paper, we explore the implications of their coverage for the ESG and capital market performance of firms.

To examine the impact of ESG coverage (not ratings) on firms, we focus on the times four major ESG rating agencies – *MSCI KLD*, *Refinitiv*, *Sustainalytics*, and *Bloomberg* – initiated coverage of large groups of firms in the market. Individual firms do not influence the coverage decisions of ESG rating agencies. Focusing on coverage initiations of large groups of stocks also mitigates concerns that coverage could reflect some firm-specific events – for example, additions to major market indices or acquisitions. Agencies, however, could be biased towards stocks with certain characteristics. To control for this selection, we compile a sample of firms already covered by some agencies and study the effect of additional coverage initiation on firms relative to similar firms that did not receive the additional coverage. A multi-dimensional matching procedure and numerous fixed effects further control for a broad set of covariates that could simultaneously affect both ESG coverage and subsequent firm behavior.

Our main results could be summarized as follows. First, when firm ESG coverage intensifies, its ESG ratings improve, its toxic emissions decline, and its board diversity increases. Second, firms with more ESG ratings disclose more ESG-related information. Third, operating in

the ESG spotlight intensifies firm M&A activity towards targets with strong ESG performance. Fourth, ESG coverage transfers ownership from individual investors towards financial institutions, especially institutions with revealed preferences for ESG stocks. Finally, ESG coverage improves firm capital market performance.

The effect of ESG coverage is persistent and robust to the inclusion of fixed effects for the firm, the firm industry, the rating agency, and all major stock market indices. Furthermore, the effect is not observed over pre-treatment periods (parallel trend assumption). The results are also economically meaningful. For example, an initiation of ESG coverage by an additional agency increases firm ESG score by around 8 percent relative to otherwise similar firms that did not receive the additional coverage. One unit of treatment also increases firm institutional ownership by 1.38 percent (for comparison, the average institutional ownership in our sample is 61.1 percent).

The improved ESG performance of covered firms is subject to alternative interpretations. For one, it is possible that greater coverage creates incentives for rating agencies to overstate their ratings, the way it does for bond rating agencies (e.g., Bolton et al. 2012; Becker and Milbourn 2011). We argue that rating inflation is less likely in the ESG space because ESG rating agencies are neither hired nor paid by firms, but by the users of their ratings.<sup>1</sup> There is also evidence that high ratings could damage the reputation of an agency upon the revelation of adverse ESG information to the market (see Section 4.2).

An alternative interpretation of the higher ratings could be *greenwashing*, or the tendency of firms to overstate their ESG performance in voluntary disclosures. Several of our tests, however, suggest that greenwashing is unlikely to explain the totality of our results. First, greater

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<sup>1</sup> See e.g., <https://www.reuters.com/business/sustainable-business/regulators-turn-spotlight-company-sustainability-ratings-2021-07-26/>

ESG coverage brings real improvements to ESG performance – more covered firms reduce their toxic emissions and increase the diversity of their corporate boards. We also show that firms with additional coverage experience smaller number of government enforcement actions for labor and customer violations. Finally, inconsistent with ESG manipulation, we find that improved ESG ratings never reverse in the long run following the additional coverage.

It has been proposed in the literature that higher ESG ratings could lower the firm cost of capital (e.g., Engle et al. 2020; Goss and Roberts 2011; Chava 2014; Krueger, Sautner, and Starks 2020; Dyck et al. 2019). In this respect, greater ESG coverage could lower the cost of capital of firms because it provides a signal about ESG performance. Since firms with less (or no) coverage would be considered “less-compliant” with ESG, ESG-conscious investors could withhold from investing in the firm. Consistent with this idea, we show that ESG coverage increases firm institutional ownership. The increased investor recognition is also expected to decrease the firm cost of equity capital (Merton 1987). Consistent with a lower cost of capital, we also find that more covered firms exhibit higher valuation ratios.

Our findings suggest that ESG rating agencies affect real economic activity. The results are broadly consistent with Pastor, Stambaugh, and Taylor (2021), who argue that increased demand could bid up the prices of green assets. Along the same lines, ratings are important because they provide information that investors demand. In this regard, our results echo the evidence on information production in other settings. For example, an extensive literature shows that more and better accounting disclosures can lead to tangible capital-market benefits for firms (see, e.g., Christensen, Hail, and Leuz 2019). There is also evidence that bond ratings provide value (Hand et al. 1992; Kliger and Sarig 2000).

We add to the growing literature on ESG. Most of the existing research evaluates the economic implications of ESG ratings (see, e.g., Deng, Kang, and Low 2013; Ng and Rezaee 2015; Lins, Servaes, and Tamayo 2017; Hartzmark and Sussman 2019). In contrast, we show that ESG coverage improves both firm ESG and financial performance. Our paper is related to the work of Krueger et al. (2021) who find that mandatory ESG disclosures increase both the availability and the quality of ESG reporting. The results also imply that firms with greater ESG coverage, such as public firms, could be advantaged relative to firms with smaller ESG coverage.

The paper also provides an insight into aggregate M&A activity. It is well documented that merger activity evolves in waves (Mitchell and Mulherin 1996; Harford 2005; Rhodes-Kropf and Viswanathan 2004). One common explanation of this fluctuation is a strategic response to technological and regulatory shocks. Economic activity, however, is guided not only by formal regulations but also by existing social norms. Our results suggest that systematic shifts in social norms could influence aggregate M&A activity in the market.

The remainder of the paper is organized as follows. Section 2 discusses the real effect of ESG rating agencies; Section 3 outlines our empirical methodology; Sections 4 and 5 report the results on the implications of ESG coverage for firm ESG and financial performance. Section 6 concludes.

## **2. The Real Effect of ESG Rating Agencies**

The demand for ESG information has been increasing over time. ESG disclosures, however, face a series of challenges. Perhaps the most important one is the multidimensional nature of ESG.<sup>2</sup> Currently, the term ESG encompasses a wide set of activities and policies, all of

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<sup>2</sup> See Christensen, Hail, and Leuz (2019) and Larcker, Tayan, and Watts (2021) for a review of the literature on current ESG disclosures and the adoption of ESG standards.

which could differ substantially across firms, industries, and countries. As a result, the ESG information that exists in the market is non-standardized and fragmented, which in turn substantially decreases its usefulness to market participants (Kitzmueller and Shimshack 2012; Liang and Renneboog 2017; Amel-Zadeh and Serafeim 2018).

To fulfill the need for standardized ESG information, a series of private entities (agencies) started constructing ESG ratings of firms. The coverage of these agencies has expanded gradually over time, and currently, they constitute the primary source of ESG information in the market (see, e.g., Gibson et al. 2020). By aggregating information from various sources and standardizing it, ESG rating agencies effectively serve as a disclosure mechanism of ESG information. While the actual content of ESG scores has been debated in the literature (Berg, Koelbel, and Rigobon 2019; Dimson, Marsh, and Staunton 2020), the wide use of these ratings suggests that ESG rating agencies could be an important player in modern markets.

Rating agencies could affect firm performance because they provide information about the ESG standing of firms. Firms without coverage would be considered “non-compliant” with ESG norms. As a result, major stakeholders such as employees and investors could withhold from doing business with the firm. In contrast, firms with coverage have the flexibility to comply with ESG norms when optimal to do so because their ESG performance could be reliably communicated to the market. This value of this flexibility would generally depend on the strength of ESG norms in the market.

There is extensive evidence that high ESG scores could lower firm cost of capital. ESG ratings shape the investment decisions of an increasingly large group of institutional investors (see Gibson et al. 2020; GSIA 2016; USSIF 2020). Indeed, fund investors’ preferences for ESG

firms have largely contributed to the expansion of the ESG rating industry. For example, Hartzmark and Sussman (2019) show that investors allocate more capital into funds with the best ESG portfolios and withdraw funds from funds with the worst ESG portfolios. Similarly, Bauer et al. (2021) document that pension funds' clients prefer the funds they invest in to engage with more sustainable companies. Some institutional investors also engage in environmental and social activism to improve their holdings' ESG profile (Dimson et al. 2015; Krueger, Sautner, and Starks 2020; Azar et al. 2021).

The fact that firm ESG disclosures are voluntary and largely unaudited has raised concerns that firms could behave opportunistically and over-state their ESG performance, an activity referred to as *greenwashing*. Consistent with this possibility, Li and Wu (2020) show that firms could join the United Nations Global Compact (UNGC) to signal corporate social responsibility engagement while maintaining similar ESG performance. A firm propensity for opportunistic ESG disclosures, however, could be mitigated by monitoring by the public (Kim and Lyon 2015). Marquis et al. (2016) also show that firms in countries with a higher level of scrutiny and social norms are less likely to engage in ESG misrepresentations.

There is also anecdotal evidence that the ESG ratings issued by different agencies often diverge (Mackintosh 2018; Wigglesworth 2018). Berg, Koelbel, and Rigobon (2019) decompose the divergence into three sources: different scope of categories, different measurement of categories, and different weights of categories. They find that scope and measurement divergence are the main drivers in rating dispersion. Disagreement among information providers, however, is expected if they indeed generate new information. Consistent with the idea that



diverse opinions are informative, Christensen, Serafeim, and Sikochi (2021) show that greater ESG disclosure leads to greater ESG rating disagreement across providers.<sup>3</sup>

### 3. Empirical Design

#### 3.1. Methodology

Assessing the economic impact of ESG rating agencies requires comprehensive data about firms' exposure to ratings, independently of the information that these ratings provide. To address this challenge, we identify the times four major ESG rating agencies – *MSCI KLD*, *Refinitiv*, *Sustainalytics*, and *Bloomberg* – initiated coverage in the market.

Several reasons motivate us to focus on these specific data providers. First, these agencies have been recognized as important sources of ESG information by independent third parties. For example, ERM, the largest global sustainability consultancy, includes all four providers in their 2020 report and notes that the ratings most favored by investors are *MSCI KLD* and *Sustainalytics*.<sup>4</sup> Harvard Business Review includes these agencies in the list of well-known third-party ESG rating providers.<sup>5</sup> Multiple advisory and consulting firms also consider these agencies as ESG data providers of primary relevance.<sup>6</sup> Finally, numerous institutional investors rely on these ratings for ESG information on their portfolio companies.<sup>7</sup>

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<sup>3</sup> Gibson, Krueger, and Schmidt (2019) find that stock returns are positively related to ESG rating disagreement, suggesting that risk-averse investors could demand a risk premium for large disagreements.

<sup>4</sup> See <https://www.sustainability.com/globalassets/sustainability.com/thinking/pdfs/sustainability-ratetheraters2020-report.pdf>

<sup>5</sup> See <https://corpgov.law.harvard.edu/2017/07/27/esg-reports-and-ratings-what-they-are-why-they-matter/>

<sup>6</sup> For example, see <https://www.sicm.com/docs/who-rates.pdf>, <https://brokerchooser.com/how-to-invest/top-esg--rating-providers>, <https://frameworkesg.com/wp-content/uploads/2019/08/RatingsRankings2019.pdf>, and <https://investmentsandwealth.org/getattachment/dfd4d0e3-adc0-487a-bbe0-624cdefb3b2f/IWM17NovDec->

<sup>7</sup> For example, many institutional investors explicitly refer to the MSCI data; Morningstar incorporates Sustainalytics scores into their ESG fund rating computation; Bloomberg provides ESG data to the broad business community; and ASSET4 had the largest financial firms among its clients even before its eventual acquisition by Refinitiv. See <https://www.sustainable-investment.org/Ratings/Researchkonzepte/Asset4.aspx>

The above databases have also been used extensively in academic research. Overall, the *MSCI KLD* data appears to be the most used by researchers (e.g., Lins et al. 2017; Hartzmark and Sussman 2019; Ferrell et al. 2016; Di Giuli and Kostovetsky 2014; Deng et al. 2013; Engle et al. 2020). This is not surprising, given that *MSCI KLD* is the oldest provider of ESG information in the market. However, multiple studies also rely on *Sustainalytics* (e.g., Dyck et al. 2019; Engle et al. 2020), *Refinitiv* (former *ASSET4*) (Stellner et al. 2015), and *Bloomberg* disclosure scores (Ng and Rezaee 2020; Gualandris et al. 2021; Dyck et al. 2019). Two recent studies, Christensen et al. (2021) and Bolton and Kacperczyk (2021), employ all four datasets in their analysis.

A few other agencies also provide ESG information, but their methodology and coverage are not relevant to our research design. For example, *RepRisk* is one of the leading data science companies focusing on ESG risks research. The business model of the company is to evaluate the media coverage of all firms in the market, as it relates to ESG issues, and identify negative commentaries. As such, the concept of coverage here is not well defined. Another data provider, *Corporate Knights* Global 100 exhibits sparse U.S. coverage as it focuses on the top 100 sustainable firms in the world. *RobecoSAM* has also been focusing predominantly on European firms. In contrast, the four agencies in our study exhibit long history of comprehensive coverage, strong reputation, and clear coverage criteria, allowing us to identify precisely shocks to ESG exposure.

Panel A of Table 1 lists the inclusion criteria for the 10 coverage initiations of domestic publicly traded companies analyzed in this paper (the timeline of the events is visualized in Figure 1). We observe that rating agencies exhibit a preference towards larger firms and members of major market indices. As a result, a good identification strategy needs to control for these preferences.

To control for the selection in coverage, we construct a sample of firms with existing ratings from some of the four ESG rating agencies and evaluate the impact of additional coverage. Focusing on firms that were already selected for coverage controls for the preferences of rating agencies towards stocks with certain characteristics, as revealed in their choices. For each event of coverage expansion, we then identify all firms that receive additional coverage and could be matched to firms that exhibit similar probability of receiving the additional coverage but were not selected by the rating agency. To identify such firms, we run a Propensity Score Model (PSM) predicting the probability of additional coverage based on firm characteristics sampled one year before coverage expansion. We then match each treated firm to five untreated firms with the closest propensity score (if available). All matched firms constitute the control group.<sup>8</sup> Figure 2 illustrates our sample construction procedure. The regions “T” and “C” correspond to our treatment and control groups.

Table 2 reports estimated coefficients from the PSMs corresponding to all seven expansion events used in the paper. Note that we lose the first three events because we focus only on firms with existing coverage. The predictive variables include firm ESG score, total assets, market-to-book ratio, number of covering agencies, return on assets (ROA), as well as industry fixed effects. The predictive power of these variables varies across events. The most consistent predictor of ESG coverage is firm size (total assets). More covered firms also tend to have larger number of institutional investors. Valuation ratios and ROAs are generally positively correlated with ESG coverage, but the significance of these variables is less pronounced across events. Interestingly, existing ESG ratings are not significantly related to the probability of receiving additional coverage (the only exception is the Sustainalytics coverage in 2009).

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<sup>8</sup> We exclude matches with propensity scores difference exceeding 0.002.

Based on the above sample, we estimate a difference-in-differences model with industry and year fixed effects, evaluating the marginal impact of additional coverage of a firm (treated firm) relative to a similar firm that did not receive the additional coverage (control firm):

$$Y_{i,t} = \alpha + \beta.Treated_{i,t} + \gamma.Post_{i,t} + \delta.Treated_{i,t} * Post_{i,t} + IndustryFE + YearFE + \epsilon_{i,t}, \quad (1)$$

The dependent variables  $Y_{i,t}$  measure various characteristics of firm  $i$  at time  $t$ , such as ESG ratings and performance. *Treated* is an indicator variable equal to 1 for treated firms (those with initiated coverage by a data provider) and equal to 0 for control firms (those without initiated coverage by the same data provider). *Post* is a variable indicating whether a particular firm-year observation (for both treated and control firms) is before or after the corresponding expansion of coverage. We also include the difference-in-differences term, the interaction term *Treated \* Post*.

To estimate the model in (1), we follow each firm from *five years before* until *five years after* the initiation of additional coverage. By design, each firm can receive additional coverage up to three times (we update the matched firms with every additional treatment). Our final sample of matched firms contains 44,134 firm-year observations across 1,485 unique firms.

Table 1 (Panel B) reports the number of firms with initiated coverage in each of the ten cases, as well as the number of firms included in our sample. These are the stocks of firms whose ESG performance has already been ranked by another agency and that could be matched with (up to five) similar firms based on the PSM. As a result of these filters, only around 23 percent of the initial firms are included in our final sample. Being the oldest ESG rating provider, MSCI KLD tends to lead in coverage all other agencies. As a result, MSCI KLD coverage initiations do not enter the final sample. However, we use MSCI KLD rating information in our ESG tests.

### 3.2. Data sources

We compile our data from multiple sources. As noted earlier, we focus on the ESG coverage of four leading ESG rating providers: *MSCI KLD*, *Refinitiv* (former *ASSET4* and *Thomson Reuters*), *Sustainalytics*, and *Bloomberg*. We obtain the actual ESG data from WRDS and Bloomberg and firm coverage criteria directly from the providers.

Table 1 (Panel A) reports the major coverage expansion times for the selected agencies along with the coverage criteria. We observe that the inclusion criteria are similar among data providers and tend to favor larger firms and members of major market indices, such as Russell 1000 and S&P500. MSCI KLD and Refinitiv provide precise coverage requirements. Sustainalytics confirmed the coverage expansion years and that they cover primarily large-cap U.S. firms. Bloomberg initiated coverage of companies that provide access to original, transparent, and publicly available data representing at least 80% of the company operations and at least 80% of the company's workforce in 2010.

Our study includes all publicly traded firms in CRSP and Compustat with fiscal years between 1985 and 2020. We exclude highly regulated financial firms and utilities. CRSP provides historical information on prices, returns, and shares outstanding for all stocks traded on the U.S. major exchanges: NYSE, AMEX, and Nasdaq. Compustat is supplied by Standard & Poor's and provides comprehensive accounting data for all publicly traded U.S. companies.

We complement the above data with mergers and acquisitions information from SDC Platinum, keeping all deals over \$1 million completed by public US-based acquirers between 1985 and 2020. We focus on deals completed within a firm's fiscal year, excluding stock repurchases and partial acquisitions with share owned after transactions not exceeding 50%. To

match the Compustat with SDC data, we first employ a name and date mapping, created by Phillips and Zhdanov (2013) and updated by Ewens, Peters, and Wang (2019). We then manually match all residual firms based on cusips, tickers, and names.

We also obtain institutional ownership level data from the Thomson/Refinitiv Ownership (Consolidated Holdings) dataset. We focus on the ownership for a firm primary share class and select the variables as of the last quarter available for each year to complement the Compustat dataset.

To examine the effect of ESG coverage on firm environmental policy, we employ data from the Environmental Protection Agency's (EPA) Toxics Release Inventory (TRI). The EPA provides U.S. manufacturing firms' facility-level disclosures of toxic chemicals emissions. To match the sample firms with parent firms reporting their facility releases to EPA, we use the matching table provided by Xiong and Png (2019)<sup>9</sup>. To examine the effect of ESG coverage on firm corporate governance, we obtain corporate board information from MSCI GMI Ratings.

The data on Government Enforcement Actions comes from the Violation Tracker database provided by the non-profit organization Good Jobs First. It documents law violations written by over 50 US federal agencies. The data classifies all violations into several primary offense groups. Based on this classification, we identify government enforcement actions related to *environmental*, *social* and *governance* irregularities.<sup>10</sup> We then count the number of violations within each of these three categories for a firm each year.

In Table 3, we report means and standard deviations of all variables in the sample, as well as averages of all variables across the treatment and control groups, measured at the end of the

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<sup>9</sup> We thank Dr. Po-hsuan Hsu and Dr. Chi-Yang Tsou for providing the matching table.

<sup>10</sup> Environmental violations are already classified by the data. We classify as social violations all employment and consumer-related cases, as well as all safety-related violations related to food or product safety, mining, workplace safety, and health issues. Finally, we classify all financial violations as governance irregularities.

matching year.<sup>11</sup> Sample and control firms are similar with respect to their ESG scores and total assets. In addition, they are also very similar with respect to their acquisition expenditures and M&A deal characteristics. Treated firms disclose more ESG information and tend to have higher valuation ratios and institutional ownership, more female directors, and larger corporate boards than control firms.

## **4. ESG Coverage and ESG Performance**

### *4.1. ESG ratings*

We start our analysis by exploring the implications of ESG coverage for ESG performance. Table 4 reports the estimates from our baseline model (1) for firm ESG score based on MSCI ratings as a dependent variable. We focus on MSCI because it is the rating agency with the longest history in the industry. Since most firms in our sample receive their first coverage by MSCI, the paper focuses on coverage initiations from the other three agencies (see Panel B of Table 1).

MSCI ratings consist of binary indicators for strengths and concerns along the E, S, and G dimensions, as well as miscellaneous indicators that do not fit in these three categories. Since the number of indicators varies from year to year, we follow the existing literature to make the ratings comparable across time (see, e.g., Kempf and Osthoff 2007, Halbritter and Dorfleitner 2015). To this end, we first compute the total ESG score as the sum of all E, S, and G strengths

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<sup>11</sup> The Appendix presents the definitions of all variables used in the analysis. We scale most of the variables by total assets (lagged total assets for flow variables). To ensure outliers do not skew the results, we winsorize all variables at 1% and 99%.

minus the sum of all E, S, and G concerns. We also compile the miscellaneous indicators into a separate “X” score.<sup>12</sup> We then normalize the scores each year between 0 and 100.<sup>13</sup>

The results for the ESG score are presented in column (1) of Table 4. The dependent variables in columns (2) to (4) are the E-, S-, and G-components of the index, respectively, while the dependent variable in column (5) includes all components of the ESG index that cannot be classified along the E/S/G dimensions. Our primary variable of interest, the interaction term *Treated \* Post*, is positive and statistically significant in models (1) through (4).<sup>14</sup> The results are also economically significant. For example, model (1) implies that initiation of additional ESG coverage by another agency increases firm ESG score by additional 8.37 percent and the E-component of the score by additional 3.91 percent relative to the control group.

Table 5 reports estimates from versions of the baseline model with different fixed effects. As shown in Table 1, ESG rating agencies often cover (parts of) major market indices. In model (1) of Table 5, we extend our baseline model by including agency and index fixed effects. Specifically, we include fixed effects for the Sustainalytics, Refinitiv, and Bloomberg agencies and membership in the following indices – S&P 500, Dow Jones Industrials, Dow Jones Transportation, and Dow Jones Utilities. Although the addition of these fixed effects reduces slightly the magnitude of the *Treated \* Post* coefficient, the interaction term remains both statistically and economically significant.

Models (2) and (3) of Table 4 substitute the industry and year fixed effects in the baseline model with firm and industry-year fixed effects. We observe that the *Treated \* Post* coefficient remains significant in these model specifications. Model (4) of Table 4 uses as a dependent

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<sup>12</sup> We calculated an alternative ESG score containing the miscellaneous indicators as additional ESG dimension. Employing the alternative score yields quantitatively similar results.

<sup>13</sup> The normalization formula is:  $(ESG - \min(ESG)) / (\max(ESG) - \min(ESG))$ .

<sup>14</sup> The results hold for firms with low and high ESG ratings at the time of coverage expansion (these results are not tabulated).



variable the average ESG rating based on the MSCI KLD, Sustainalytics, and Bloomberg normalized scores.<sup>15</sup> Consistent with the MSCI results, here we also observe that the ESG performance of a firm increases after it receives an additional coverage from an ESG rating agency.

#### *4.2. Are agencies inflating their ratings?*

Rating agencies could exhibit conflicts of interest when their profits are linked to the firms they rate. For example, bond rating agencies are generally paid by the issuers, which creates incentives for an agency to provide higher ratings (Jiang et al. 2012; Bolton et al. 2012). Becker and Milbourn (2011) contend that competition among rating agencies could increase ratings even further. Is it possible that our results capture rating inflation in the ESG space?

We argue that rating inflation is less likely in the case of ESG given that ESG rating agencies are neither hired nor paid by firms but by the users of their ratings.<sup>16</sup> ESG rating providers are in some direct or indirect way paid by investors, so they are not subject to the issuer-pays problem that continues to prevail among credit rating agencies (Walter 2020). Also note that we measure ESG performance not with the ratings of the agency initiating the additional coverage but with the ratings of another provider, which mitigates potential incentives for rating manipulation even further.

ESG rating inflation could also be damaging to the reputation of the agencies, given the bad publicity surrounding corporate scandals and ESG-related missteps. For example, MSCI acknowledges the Volkswagen (VW) emissions scandal in its ESG research reports and the fact

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<sup>15</sup> For treated firms, we do not include scores from the agency that initiated additional coverage in the mean ESG calculation, given the absence of pre-treatment observations for a given rating

<sup>16</sup> See e.g., <https://www.reuters.com/business/sustainable-business/regulators-turn-spotlight-company-sustainability-ratings-2021-07-26/>

that it noted a deterioration of VW's corporate governance practices some time before the scandal and removed VW from its MSCI ACWI ESG Index.<sup>17</sup> For all these reasons, we believe that strategic inflation of ESG ratings is not the likely explanation of our findings.

#### *4.3. Real ESG performance*

Here, we examine the implications of increased ESG coverage for real ESG performance. We focus on two aspects of ESG – environmental and governance. To assess firm environmental impact, we use the data from the Environmental Protection Agency's Toxics Release Inventory (TRI).

Our main environmental variable is total toxic releases scaled by toxicity. Following Russo and Harrison (2005), we proxy toxicity by the threshold for reporting accidental spills – the “reportable quantities” (RQ) in the EPA's Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The reportable quantity varies from 1 pound to 5000 pounds for relatively benign chemicals. To construct the measure, first, we divide each toxic chemical release (in pounds) by its corresponding RQ and then aggregate all scaled quantities across firms. We then scale the measure by total assets. We also calculate the number of facilities as an additional dependent variable.

Table 6 reports the results. We observe that after a firm receives additional coverage by an ESG rating agency, it reduces its toxicity-scaled releases by an additional 6.01% compared to the control group. The last model of Table 6 shows that the change in the total number of facilities is not significantly different across the treatment and control groups, indicating that firms reduce their environmental footprint by cleaning up existing technologies instead of closing facilities.

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<sup>17</sup> See <https://www.msci.com/volkswagen-scandal>

To assess the implications of ESG coverage for the social and governance aspects of firms, we focus on corporate boards. The dependent variable in model (1) of Table 7 is the share of outside directors. It is well accepted in the literature that outside directors are better monitors (see, e.g., Weisbach, 1988; Nguyen and Nielsen, 2010). ESG coverage, however, does not seem to exhibit a significant impact on the number of outside directors.

Model (2) of Table 7 shows that greater ESG coverage induces firms to hire more female directors. Model (3) of Table 7 further suggests that this is not simply window dressing because the new women directors tend to be outsiders. The greater female representation on a corporate board is an indication that coverage by ESG rating agencies improves the social performance of covered firms. This finding is also consistent with the ESG results given that female directors are more involved with ESG (McGuinness, et al. 2017; Dyck, et al. 2021). Finally, model (4) shows that greater coverage by ESG agencies tends to reduce the size of the corporate board.

Table 8 examines the implications of coverage by ESG rating agencies for violations of regulations imposed by 50 US federal agencies. As noted earlier, most of the violations could be classified into an environmental, social, and governance category. The dependent variables in models (1) through (3) of Table 8, count the number of violations in each time by a firm each year. We observe that the number of social violations of a firm decrease significantly after it receives an additional coverage by an ESG rating agency relative to the control group. The number of environmental and governance violations does not seem significantly related to ESG coverage.

#### *4.4. Is ESG improvement reflecting omitted confounding effects?*

Our design controls for a wide range of confounding effects that could affect both ESG coverage and ESG performance. In this section, we perform a series of additional tests aimed at ruling out a spurious association between ESG coverage initiation and ESG performance.

If additional ESG coverage indeed prompts firms to engage in activities that improve their ESG standing, we would expect treated firms to engage in strategies aimed at improving ESG. We show that this is indeed the case. In Table 9, we examine some possible strategic responses of firms with additional coverage. The dependent variable in model (1) of Table 9 is the number of ESG-related words in a firm 10-K filing. To calculate this number, first, we construct a dictionary of ESG words based on the language used by MSCI KLD and Refinitiv to describe the scope of ESG coverage in their handbooks.<sup>18</sup> The complete ESG dictionary is presented in Appendix B. We then scan each 10-K file and count the number of ESG-related words from the dictionary mentioned in the document.<sup>19</sup> Model (1) of Table 9 shows that ESG coverage intensifies firm ESG disclosures.

The last three models of Table 9 focus on acquisitions. Models (2) and (3) show that more covered firms are not more likely to engage in acquisitions. However, these firms are more likely to acquire targets with high ESG scores (model (4)). In totality, these results are consistent with the idea that ESG coverage triggers a strategic response in firms aimed at improving their ESG standing.

If firms are prompted to improve their ESG performance by rating agencies, they would be also more likely to comment on the coverage. A review of the 10K filings of firms that have

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<sup>18</sup> Out of the four agencies, MSCI and Refinitiv are the only ones providing a detailed description of their ranking criteria, with MSCI being the most complete and informative source.

<sup>19</sup> We access each 10-K text document using the link from the complete EDGAR Daily Index dataset with all the daily filings from 1990 till 2017 combined into one table from the James Ryans' website (available at: <http://www.jamesryans.com>).

received an additional coverage by ESG rating agencies shows that firms discuss the increased coverage. For example, *CMS Energy Corp.* states in its 2017 annual report that “[i]n a 2016 report published by Sustainalytics, a global leader in sustainability research and analysis, CMS Energy scored the highest among 54 U.S. utilities in environmental, social, and governance performance.” *Xylem Inc.* comments in its 2020 annual report that its 2019 Credit Facility includes a pricing grid that “determines the applicable margin based on Xylem’s credit rating, with a further adjustment depending on Xylem’s annual Sustainalytics Environmental, Social and Governance score.” These commentaries suggest that both firms and investors pay attention to the coverage provided by ESG rating agencies.

#### *4.6. Is ESG coverage promoting greenwashing?*

Ratings could affect the propensity of firms to overstate their ESG performance, a phenomenon often referred to as “greenwashing.” While our results in Tables 6, 7 and 8 suggest that covered firms tend to improve their real ESG performance, this does not rule out the possibility of greenwashing.

If firms opportunistically overstate their ESG standing in response to increased coverage, it is more likely that in the long run, a correction would follow, and the ESG score would adjust to its true level. Model (1) of Table 12 explores the annual changes in firm ESG scores relative to the year they receive the additional coverage (Figure 1 plots the trends in ESG scores across the treatment and control groups). We observe that the ESG improvement of a newly covered firm is concentrated over the first two years after the coverage and stabilizes after that (there is some additional increase in year 5). We do not observe any reversals of ESG ratings for years +1 to +5 following the event.

In sum, our analysis suggests that the increase in ESG ratings due to the additional coverage by ESG agencies is not a result of increased greenwashing by firms. One possible explanation of this result is that rating agencies are sophisticated enough to identify greenwashing activities by firms, which makes greenwashing ineffective in increasing ESG ratings. We note, however, that greenwashing could still be effective in manipulating consumers' perceptions.

## **5. ESG Coverage and Firm Ownership Structure and Performance**

### *5.1. Firm institutional ownership*

Table 10 evaluates changes in the level of institutional ownership in response to additional ESG coverage. The dependent variable in model (1) is the percentage of institutional ownership, while the dependent variable in model (2) is the number of institutional owners.

We find that an increase in the ESG coverage tends to increase the level of institutional ownership in terms of both percentage share ownership and number of institutional investors. The effect is also economically meaningful. For example, one unit of treatment increases firm institutional ownership by 1.38 percent, which is a 2.26 percent increase relative to the sample mean of 61.1 percent.

The last two models of Table 10 evaluate the implications of ESG coverage for institutions with a revealed preference for high- or low-ESG stocks. We classify institutions as ESG-friendly or ESG-unfriendly as follows. Each year, we sort stocks into two groups depending on whether they rank above (HESG) or below (LESG) the median ESG score in the market that year. Afterward, we calculate the percentage allocation of each institutional investor

across the two types of stocks, HESG and LESG, normalized with the relative weight of these groups of stocks in the market portfolio. We refer to these adjusted weights as HESG-bias and LESG-bias, respectively. We measure the overall bias of an institution towards high-ESG stocks as the difference of its HESG-bias minus its LESG-bias. In other words, investors exhibit revealed preferences for ESG stocks if they tend to over-weight high-ESG stocks and under-weight low-ESG stocks. We then classify institutions in the top (bottom) 20% of their overall bias as having a revealed preference for high- (low-) ESG stocks.

We find that an increased ESG coverage by rating agencies tends to expand the ownership by institutions with a revealed preference for high-ESG firms. More specifically, one unit of treatment increases firm ownership by ESG-conscious institutions by around 1.56 percentage points. The ownership by institutions with a revealed preference for low-ESG firms does not respond to the additional coverage.

Our institutional ownership results are consistent with the evidence that institutional investors incorporate ESG information in their investment decisions (Dyck et al. 2019; Hong and Kacperczyk 2009). Given that institutional investors value ESG information, they would find firms with (more) ratings more attractive. Chen, Dong, and Lin (2020) find that institutional ownership improves firm ESG performance through ESG-related proposals. Dimson, Karakas, and Li (2015) further show that institutional investors are more likely to engage with companies with inferior ESG performance. Furthermore, after successful engagements, companies experience improved accounting performance.

## 5.2. Firm performance

As noted earlier, ESG coverage could improve firm performance when investors value ESG. To shed light on the link between ESG coverage and performance, in Table 11, we evaluate the effect of ESG coverage on a firm's Market-to-book ratio, Tobin's Q, Price-to-earnings ratio, and 12-month return. We observe that the coefficients on the *Treated \* Post* term are positive and significant in all three valuation ratio regressions. The highest statistical significance is for the Market-to-book ratio. The ESG coverage effect is also economically meaningful. For example, one unit of treatment increases exposed firms' Market-to-book ratio with 15.9 percent. The last column of Table 12 reveals that the increase in valuation ratios happens during the first two years after the new coverage; this increase is also not observed over pre-treatment periods.

## 6. Conclusion

We find that when firm coverage by ESG rating agencies increases, its ESG ratings and ESG performance improve. More covered firms also realize better financial performance. Our results suggest that ESG rating agencies affect real economic activity. The economic impact of ESG coverage would generally depend on the strength of ESG norms. When the market values ESG, (more) covered firms would exhibit stronger incentives to improve their ESG standing because they would be better able to communicate their ESG performance to the market. In contrast, less covered firms would find it more difficult to signal their ESG performance to the market.

Some researchers have expressed skepticism about the information content of ESG ratings, citing, for example, the relatively high degree of disagreement across agencies. The



multidimensional and complex nature of ESG, however, could imply ratings that often disagree. Disagreement among information providers is also a necessary condition for information production. Our results suggest that ESG rating agencies exhibit a material impact in modern markets.

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**Appendix A**  
**Variable Definitions**

Variable	Description and Data Source
Treated	An indicator variable equal to 1 for a firm that receives an additional coverage by an ESG rating agency and 0 for a matched firm that does not receive the additional coverage. Both treatment and controls firms are already covered by some agencies. Control firms are identified using propensity score matching with replacement (five nearest neighbors with propensity score not exceeding 0.002) one year before additional ESG coverage exposure.
Post	An indicator variable equal to 1 for both treated and control firms after a treated firm receives the additional ESG coverage, and 0, otherwise.
Treated * Post	An interaction term equal to 1 for a treated firm after it experiences additional ESG coverage and 0 otherwise.
<i>ESG scores</i>	
ESG score	The total ESG score is calculated as the sum of all “E”, “S”, and “G” binary strengths and concerns indicators (with concerns subtracted from one to invert them into strengths). The aggregate indicator is further normalized each year between 0 and 100, as follows: $(ESG - \min(ESG)) / (\max(ESG) - \min(ESG))$ . <i>Source: MSCI KLD</i>
E score	Sum of all E (environmental) binary strengths and concerns indicators (with concerns subtracted from one to invert them into strengths), normalized each year between 0 and 100. <i>Source: MSCI KLD</i>
S score	Sum of all S (social) binary strengths and concerns indicators (with concerns subtracted from one to invert them into strengths), normalized each year between 0 and 100. <i>Source: MSCI KLD</i>
G score	Sum of all G (governance) binary strengths and concerns indicators (with concerns subtracted from one to invert them into strengths), normalized each year between 0 and 100. <i>Source: MSCI KLD</i>
"X" score	Sum of all indicators for companies involved in controversial business sectors, namely alcohol, firearms, gambling, military, nuclear power, and tobacco binary strengths and concerns indicators (with concerns subtracted from one to invert them into strengths), normalized each year between 0 and 100. <i>Source: MSCI KLD</i>
Mean ESG score	The average of all ESG scores available from the MSCI KLD, Bloomberg and Sustainalytics rating agencies. Each score is normalized each year between 0 and 100. For treated firms, scores from the agency initiated additional coverage are not included in the calculation. <i>Source: MSCI KLD, Bloomberg, Sustainalytics</i>
<i>Performance</i>	
Total assets	The natural logarithm of one plus total assets ( <i>at</i> ). <i>Source: Compustat</i>
Market-to-book ratio	The natural logarithm of one plus market value of equity scaled by book value of equity. Book value of equity equals stockholders' equity ( <i>seq</i> , if missing <i>pstk+ceq</i> , if missing <i>at-lt</i> ) plus deferred taxes ( <i>txdltc</i> , if missing <i>txdb+itcb</i> ) minus preferred stock ( <i>pref</i> ). Market value of equity equals common shares outstanding ( <i>CSHO</i> ) multiplied by share price ( <i>PRCC_F</i> , if missing <i>PRCC_C</i> ) <i>Source: Compustat, CRSP</i>
Tobin's Q	The ratio of total assets ( <i>at</i> ) plus market value of equity (computed as above) minus book value of equity (computed as above), to the industry total assets, scaled by total assets ( <i>at</i> ) <i>Source: Compustat, CRSP</i>
12-month return	The natural logarithm of one plus past 12-month compounded returns. <i>Source: CRSP</i>
Price-to-earnings ratio	The natural logarithm of one plus income before taxes, interest, depreciation and amortization ( <i>ib</i> ) divided by market value of equity (computed as above). <i>Source: Compustat, CRSP</i>
Return on assets	Net income ( <i>ni</i> ) divided by total assets (average <i>at</i> as of the beginning and the end of the year). <i>Source: Compustat</i>

*Variable Definitions - Continued*

Variable	Description and Data Source
ESG words in 10-Ks	The natural logarithm of one plus the number of ESG-related words in a 10-K filing in a given year. We calculate the number of words as follows. First, we construct ESG vocabulary used in MSCI KLD and Refinitiv handbooks. The complete ESG vocabulary is presented in the Appendix B. Then, we access each 10-K text document using the link from the complete EDGAR Daily Index dataset with all the daily filings from 1990 till 2017 combined into one table from the James Ryans' website (available at: <a href="http://www.jamesryans.com">http://www.jamesryans.com</a> ). We scan each 10-K text submission and count the number of a given ESG-related word/phrase mentioned in each line of the document. We then sum these words up to get the final ESG words to count. <i>Source:</i> <a href="http://www.sec.gov">www.sec.gov</a>
Acquisition Expenditures	The natural logarithm of one plus acquisition expenditures ( <i>aqc</i> , replaced by 0 if missing or negative) scaled by total assets (average <i>at</i> as of the beginning and the end of the year). <i>Source:</i> Compustat
Number of Deals	The natural logarithm of one plus the number of completed deals with the effective date falling into the recent fiscal year. Partial deals (less than 50% held after transaction) are excluded from the calculation. <i>Source:</i> SDC Platinum
Target firms' ESG score	Average ESG score of all firms acquired during a year
<i>Institutional Ownership</i>	
Share of institutional ownership	Total Institutional Ownership scaled by the firm market cap. <i>Source:</i> Thomson Reuters/Refinitiv Ownership (Consolidated Holdings) dataset, CRSP
Number of institutional owners	The natural logarithm of one plus number of institutional owners. <i>Source:</i> Thomson Reuters/Refinitiv Ownership (Consolidated Holdings) dataset, CRSP
Ownership share of institutions with high-ESG preference	Institutional Ownership by Institutions with revealed preference for high-ESG stocks, scaled by the firm market cap. Each year, we sort stocks into HESG and LESG groups (above and below the median ESG score). For both groups, we calculate market weight and each institution's holdings weight. The difference between institution weight and market weight is HESG and LESG biases. Total bias is the difference between HESG bias and LESG biases. We then classify institutions in the top 20% bias as having a revealed preference for high-ESG stocks. <i>Source:</i> Thomson Reuters/Refinitiv Ownership (Consolidated Holdings) dataset, CRSP
Ownership share of institutions with low-ESG preference	Institutional Ownership by Institutions with revealed preference for high-ESG stocks, scaled by the firm market cap. Each year, we sort stocks into HESG and LESG groups (above and below the median ESG score). For both groups, we calculate market weight and each institution's holdings weight. The difference between institution weight and market weight is HESG and LESG biases. Total bias is the difference between HESG bias and LESG biases. We then classify institutions in the bottom 20% bias as having a revealed preference for low-ESG stocks. <i>Source:</i> Thomson Reuters/Refinitiv Ownership (Consolidated Holdings) dataset, CRSP
<i>Environmental Pollution</i>	
Total toxic releases to total assets	The natural logarithm of one plus the sum of toxic releases (scaled by their toxicity) by all facilities belonging to a company, divided by total assets ( <i>at</i> ). Before the summation, each chemical release is divided by its corresponding reportable quantity. Lower reportable quantity signals about higher toxicity. <i>Source:</i> EPA's The Toxics Release Inventory (TRI), the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Compustat



*Variable Definitions - Continued*

Variable	Description and Data Source
Number of facilities	The natural logarithm of one plus the number of a company's facilities reporting to the EPA. <i>Source:</i> EPA's The Toxics Release Inventory (TRI)
<i>Corporate Governance</i>	
Share of outside directors	The natural logarithm of one plus share of female directors. <i>Source:</i> MSCI GMI Ratings
Share of female directors	The natural logarithm of one plus share of independent directors. <i>Source:</i> MSCI GMI Ratings
Share of female outside directors	The natural logarithm of one plus share of female independent directors. <i>Source:</i> MSCI GMI Ratings
Board Size	The natural logarithm of one plus number of directors in a board. <i>Source:</i> MSCI GMI Ratings
<i>Government Enforcement Actions</i>	
Environmental violations	The natural logarithm of one plus the sum of all environmental violations. Environmental offenses are records with <i>offense_group</i> ='environment-related offenses'. <i>Source:</i> Violation Tracker
Social violations	The natural logarithm of one plus the sum of all employment- and consumer-related violations. Employment-related offenses are records with <i>offense_group</i> ='employment-related offenses'; or <i>offense_group</i> ='safety-related offenses' and <i>primary_offense</i> ='mining violation', 'workplace safety or health violation'. Consumer-protection-related offenses are records with <i>offense_group</i> ='consumer-related offenses'; or <i>offense_group</i> ='safety-related offenses' and <i>primary_offense</i> ='food safety violation', 'product safety violation'. <i>Source:</i> Violation Tracker
Governance violations	The natural logarithm of one plus the sum of all consumer-related violations. Consumer-related offenses are records with <i>offense_group</i> ='consumer-protection-related offenses'. <i>Source:</i> Violation Tracker

## Appendix B

### ESG Dictionary

CSR , ESG , GHG , ABUSE, ACCEPTABLE STANDARDS, ACCESS TO COMMUNICATION, ACCESS TO FINANCE, ACCESS TO HEALTHCARE, ACCOUNTING IRREGULARIT, ACRIMONIOUS CONTRACT NEGOTIATION, ADVANCED MATERIAL, AD-WARE, ALTERNATIVE ENERGY, ANTICOMPETITIVE, ANTI-COMPETITIVE, ANTI-UNION, BATTERY, BID RIGGING, BIODIESEL, BIODIVERS, BIOGAS, BIOMASS, BLENDED CEMENT, BOARD-LEVEL OBJECTION, BREACH, BRIBE, CARBON, CARCINOGEN, CAREER DEVELOPMENT, CASH PROFIT SHARING, CELLULOSIC ETHANOL, CENSORSHIP, CERTIFICATION, CHEMICAL SAFETY, CHILD LABOR, CIVIL LIBERT, CLEAN AIR, CLEAN ENERGY, CLEAN TECH, CLEAN WATER, CLEANER ENERGY, CLIMATE CHANGE, COLLECTIVE BARGAIN, COLLUSION, COMMUNITY, COMPACT FLUORESCENT LIGHTING, COMPLICITY IN KILLING, CONFLICT OF INTEREST, CONFLICTS OF INTEREST, CONTAMINATION, CORRUPTION, CUSTOMER RELATION, CUSTOMER TRUST, DATA PROTECTION, DATA SECURITY, DECEPTIVE, DEMOGRAPH, DEPLETION, DESALINATION, DEVELOPMENT PROGRAMS, DISCRIMINAT, DISPLACEMENT, DISPOSAL, DISTURBANCE, DIVERS, DROUGHT-RESISTANT SEED, ECOLOGICALLY SENSITIVE, ECONOMIC OPPORTUNITIES, ECOSYSTEM, EFFLUENTS, ELDERLY, ELECTRICAL NETWORK EXPANSION, ELECTRONIC WASTE, ELIMINATE CHEMICAL, EMISSION, EMPLOYEE, EMS , END-OF-LIFE ELECTRONIC, ENERGY EFFICIENCY, ENERGY USE, ENGAGEMENT, ENVIRONMEN, EQUIPMENT COMMERCIALIZATION, ETHIC, EXCESSIVE FEES, EXCESSIVE WORKING HOURS, FACILITY CLOSURES, FATALIT, FIREARMS, FOOD SAFETY, FORCED LABOR, FREEDOM, FRONT-RUN, FSC-CERTIFIED LUMBER, FUEL CELLS/HYDROGEN SYST, HYDROGEN, GENDER, GEOTHERMAL, GOVERNAN, GOVERNMENT SURVEILLANCE, green, H&S , HABITAT DAMAGE, HARM, HEALTHIER PRODUCT, HIDDEN FEE, HUMAN CAPITAL, HUMAN RIGHT, ELECTRIC VEHICLES, HYBRID VEHICLES, HYDRAULIC FRACTURING, IMPROPER BILLING, IMPROVED NUTRITIONAL PROFILE, IMPROVEMENT TARGET, INADEQUATE PAY, INCENTIVE, INCLUSION, INDEPENDEN, INDIGENOUS PEOPLES, INDUSTRIAL AUTOMATION, INFRASTRUCTURE DEVELOPMENT, INITIATIVES, INJUR, INSULATION, INSURING HEALTH, INTERNATIONAL NORMS, JOB ACCIDENT, JOB SATISFACTION, KIDNAP, LABOR, LAND USE, LEADERSHIP, LED LIGHTING, LEGAL LIABILITY, LOCAL COMMUNIT, LOCAL ECONOMIC, LOCK-OUTS, LONG-TERM PERFORMANCE, LOSS OF ECONOMIC VALUE, LOW-TEMP ASPHALT, MARINE, MENTAL HEALTH, MILITARY, MINORIT, MISTREAT, NATURAL, NUCLEAR POWER, NUTRITION AND HEALTH, OFF-LABEL USE, OPPORTUNITIES IN CLEAN TECH, OPPORTUNITIES IN HEALTH, OPPORTUNITIES IN NUTRITION, OPPOSITION TO SHAREHOLDER, OPTIMIZATION TECH & SYST, OTHER ENERGY STORAGE, OVERTIME, PACKAGING MATERIAL, PERFORMANCE AUDITING, PERFORMANCE INCENTIVES, PERSONAL DATA, PHILANTHROP, POLLUTION, PREDATORY FINANCIAL, PREDATORY PRICING, PRICE FIXING, PRISON LABOR, PRIVACY, PRODUCT QUALITY, PRODUCT RECALL, PRODUCT RECOVERY, PRODUCT SAFETY, PRODUCT TESTING, PROFESSIONAL DEVELOPMENT, PUBLIC HEALTH, QUALITY CONCERN, RAINWATER HARVESTING, RAW MATERIAL SOURCING, RECLAMATION COST, RECYCL, REDUCTIONS IN BENEFITS, RENEWABLE ENERGY, RENEWABLE POWER, REPLACEMENT WORKERS, REPRESENTATION, REPRESS, REPUTABLE, REPUTATION, RESOURCE INTENSIVE, RESPONSIBLE INVESTMENT, RESPONSIBLE MARKETING, REUSE, RIGHTS VIOLATION, SABOTAGE, SAFETY, SCRUTINY, SECURITY, SHAREHOLDER OBJECTION, SHAREHOLDER RIGHT, SHARING PROGRAM, SLAVE LABOR, SMALL HYDRO, SMART GRID, SMART METER, SOCIAL, SOLAR, SOVEREIGN, SPAM, SPECIALTY CEMENT, SPILL, STAKEHOLDER, STRIKE, SUB-STANDARD TREATMENT, SUPERCONDUCTOR, SURVEILLANCE, SUSTAIN, TAKEOVER DEFENS, TAX EVASION, TENANT ENGAGEMENT, TOXIC, TRAINING, TRANSPAREN, UNDERAGE LABOR, UNDERAGE WORK, UNDER-BANKED, UNDERQUALIFICATION, UNDERREPRESENT, UNDERSERVED POPULATION, UNION DENSITY, UNION RELATION, UNIONIZ, UNIONS, UNSAFE WORK, VIOLENCE, VULNERABLE POPULATION, WASTE, WATER, WAVE TIDAL, WEAPON, WORKFLOW DISRUPTION, WORKFORCE, WORKING CONDITION, WRONGFUL TERMINATION

## **Appendix C**

### **Empirical evidence on ESG ratings and firm performance**

A large body of work has examined the connection between actual ESG ratings (not coverage) and organizational performance. Here, we review some of the literature.

The term ESG was introduced in 2006. ESG issues were first mentioned in the 2006 United Nation's Principles for Responsible Investment (PRI) report consisting of the Freshfield Report and “Who Cares Wins.” ESG criteria were, for the first time, required to be incorporated in the financial evaluations of companies. Not surprisingly, the early studies did not consider ESG as an aggregate concept; but focused on some specific aspects of ESG performance. For example, Dowell, Hart, and Yeung (2000) find that firms with more stringent global environmental standards are associated with higher market valuations. Hong and Kacperczyk (2009) show that publicly traded companies involved in alcohol, tobacco, and gaming (“sin” stocks) have higher expected returns than otherwise comparable stocks, consistent with a higher cost of equity. Along the same lines, Ng and Rezaee (2015) document that higher levels of both economic sustainability disclosure and higher ESG score result in a lower cost of equity. Edmans (2011) focuses on the relationship between employee satisfaction and long-run stock returns. He finds that the “100 Best Companies to Work for in America” significantly outperformed both the market and their industry peers throughout the 80s and 90s. Servaes and Tamayo (2013) document that corporate social responsibility (CSR) and firm value are positively related for firms with high customer awareness.

In a more recent paper, Krüger (2015) studies how the stock markets react to positive and negative events concerned with a firm’s corporate social responsibility. He finds that investors respond strongly negatively to negative events and weakly negatively to positive events. He attributes the negative response to positive CSR news to agency problems.

Some studies have also examined the implications of ESG for firm performance in different settings and situations. Deng, Kang, and Low (2013) find that acquirer ESG performance is an important determinant of merger performance. Specifically, more socially responsible acquirers realize higher merger announcement returns and larger increases in post-merger long-term operating performance. Lins, Servaes, and Tamayo (2017) also find that more socially responsible firms performed better during the 2008–2009 financial crisis. They attribute the better performance of socially responsible firms to lower cost of capital.

**Table 1**  
**ESG Coverage Expansion Chronology**

Panel A describes the criteria for the ESG coverage initiations and expansions of large groups of stocks for the four major ESG rating agencies analyzed in the paper. Inclusion year indicates the year of initiation or expansion, while inclusion criteria lists the criteria used for the coverage of a firm. Panel B reports the number of firms that were added for coverage in each instance, the number of firms that were added for coverage and could be matched with a firm with similar industry and size and for which both the included firm and the matched firm have outstanding coverage from another agency at the time of the inclusion, and the percentage of matched firms relative to all added firms. We do not consider coverage expansion criteria for international firms.

**Panel A: ESG inclusion criteria**

Database	Inclusion year	Inclusion criteria
	(1)	(2)
MSCI KLD	1991	"Universe A": MSCI KLD 400 Social Index & the S&P 500 (as of August)
MSCI KLD	2001	"Universe C": MSCI KLD 400 Social Index and the top 1000 U.S. companies by market capitalization (as of December)
MSCI KLD	2003	"Universe D": top 3000 U.S. companies by market capitalization (as of December)
Refinitiv	2003	S&P500 and Nasdaq100 index members
Sustainalytics	2009	Undisclosed. Rating methodology was launched. Coverage is based on tracking several indices
Bloomberg	2010	Rating methodology was launched. Companies need to have publicly available data representing at least 80% of the company operations and at least 80% of the company's workforce. Full data transparency and access to the original documents.
Sustainalytics	2010	Undisclosed
Refinitiv	2011	Russell 1000 index constituents
Sustainalytics	2016	Undisclosed. Coverage expanded primarily from large cap US names. For North America, current coverage roughly aligns with the R1000, S&P500 and TSXCI.
Refinitiv	2017	Russell 2000 index constituents with Market Cap of at least \$400 million

**Panel B: Number of included firms**

Database	Inclusion year	Number of Inclusion Firms	Number of Matched Firms	Percentage of Matched Shocks
	(1)	(2)	(3)	(4)
MSCI KLD	1991	492	0	0
MSCI KLD	2001	324	0	0
MSCI KLD	2003	1199	0	0
Refinitiv	2003	385	66	17.14
Sustainalytics	2009	387	92	23.77
Bloomberg	2010	1919	797	41.53
Sustainalytics	2010	202	56	27.72
Refinitiv	2011	252	51	20.24
Sustainalytics	2016	1242	294	23.67
Refinitiv	2017	780	308	39.49
<b>Total</b>		<b>7182</b>	<b>1003</b>	<b>1664</b>

**Table 2**

**Propensity Score Models for the Probability to Receive Additional Coverage by an ESG Rating Agency**

The table reports coefficient estimates and standard errors from logit regressions. Treated firms are firms receiving new coverage by an ESG-rating agency next year; all sample firms have at least one existing coverage by an ESG rating agency. All models include industry Fama-French 17 industries fixed effects. All variables are computed one year before the coverage and are detailed in the Appendix. The last two rows report the total number of observations in each regression. (\*\*\*), (\*\*), and (\*) indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

	Bloomberg 2009	Refinitiv 2002	Refinitiv 2010	Refinitiv 2016	Sustainalytics 2008	Sustainalytics 2009	Sustainalytics 2015
	(1)	(2)	(3)	(4)	(5)	6	(7)
Intercept	-2.4977** (1.2039)	-30.5531*** (3.4406)	-31.1005*** (11.7114)	3.0036 (17.9458)	-39.6996*** (3.9155)	-25.475*** (2.9773)	24.9785 (1019.0131)
ESG score	0.2352 (0.2916)	-0.2721 (0.5178)	0.2799 (0.4011)	-0.2605 (0.2555)	-0.1417 (0.4365)	-0.9201** (0.4674)	-2.4096 (3.8676)
Total Assets	0.2609*** (0.0897)	0.6358*** (0.2127)	0.9329*** (0.2235)	-0.2749** (0.1386)	0.8872*** (0.1945)	0.3353* (0.1914)	-1.9067*** (0.3091)
Market-to-book ratio	0.1934* (0.1033)	0.6167** (0.2759)	1.2441*** (0.2425)	0.098 (0.1556)	0.7073*** (0.2264)	-0.2804 (0.2083)	-1.0272*** (0.3147)
Number of Institutional Owners	0.1118 (0.1707)	4.6285*** (0.597)	2.3075*** (0.5746)	0.0285 (0.3992)	5.0604*** (0.7461)	5.3243*** (0.6559)	0.0994 (0.6586)
Number of Covering ESG rating agencies	0.844* (0.4436)	- -	8.1385*** (0.8897)	1.7858*** (0.4718)	2.6102*** (0.7337)	-6.0988*** (1.0989)	1.7842 (1.1692)
Return on Assets	0.7687* (0.4461)	0.0589 (1.6282)	2.636* (1.5852)	2.32*** (0.7511)	-2.0969* (1.2082)	-1.6282 (1.0726)	2.161 (2.3307)
Industry Fixed Effects (# of significant)	5	2	0	0	2	2	0
Observations	1346	543	1129	626	1295	1036	652

**Table 3**  
**Summary Statistics**

This table reports summary statistics for variables reflecting firm ESG exposure, capital budgeting, mergers and acquisitions activity, and performance. Columns 1 and 2 presents the mean and standard deviation for the full sample. Columns 3 and 4 provide the means for the treated and control group calculated over the matching year. Columns 5 and 6 present the difference between them and the associated t-statistic. (\*\*\*) (\*\*), and (\*) indicate statistically significant differences between treated and control firms at the 0.01, 0.05, and 0.10 levels, respectively. Exact definitions of all variables are provided in the Appendix.

	Matched sample across all years		Matched sample one year prior to the shock			
	Mean	STD	Treated	Control	Treated- Control	
			Mean	Mean	Difference	t-stat
	(1)	(2)	(3)	(4)	(5)	(6)
Treated	0.36	0.48	1	0	-	-
Post	0.3934	0.4885	0.0018	0.0008	-	-
Treated*Post	0.1699	0.3755	0.0018	0	0.0018*	(1.7333)
<i>ESG scores</i>						
ESG score	3.4872	0.4197	3.5264	3.5379	-0.0115	(-0.7754)
E score	3.8496	0.3842	3.7764	3.8614	-0.0849***	(-5.7256)
S score	3.4036	0.4159	3.4656	3.4343	0.0313***	(3.0789)
G score	4.0055	0.3045	4.0758	4.0871	-0.0113	(-1.2716)
"X" score	4.129	0.2849	4.1906	4.197	-0.0064	(-1.0059)
Mean ESG score	3.3808	0.3873	3.4711	3.4746	-0.0035	(-0.3153)
<i>Performance</i>						
Total assets	6.7361	1.3798	6.9902	6.6375	0.3527***	(8.9555)
Market-to-book ratio	0.7991	0.7397	0.7589	0.7072	0.0517**	(2.3311)
Tobin's Q	1.9854	1.3654	1.9132	1.7406	0.1726***	(4.7344)
12-month return	0.0511	0.5143	0.177	0.187	-0.01	(-0.7352)
Price-to-earnings ratio	-0.0056	0.2576	-0.0069	-0.0127	0.0058	(0.9259)
ESG words in 10-Ks	6.4075	0.8587	6.4112	6.288	0.1232***	(3.9471)
Acquisition Expenditures	0.028	0.0649	0.0251	0.022	0.0031*	(1.7374)
Number of Deals	0.1787	0.3618	0.1606	0.1747	-0.0141	(-1.365)
Target firms' ESG score	3.5639	0.4553	3.5985	3.6614	-0.0629	(-0.6832)
<i>Institutional Ownership</i>						
Share of institutional ownership	0.6112	0.1172	0.6169	0.6114	0.0054*	(1.653)
Number of institutional owners	5.2999	0.6262	5.4447	5.2957	0.149***	(8.8579)
Ownership share of institutions with high-ESG preference	0.4884	0.1459	0.5019	0.484	0.0179***	(4.675)
Ownership share of institutions with low-ESG preference	0.1553	0.129	0.1582	0.1664	-0.0082**	(-2.4855)

*Table 3 – Continued*

	Matched sample across all years		Matched sample one year prior to the shock			
			Treated	Control	Treated- Control	
	Mean	STD	Mean	Mean	Difference	t-stat
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Environmental Pollution</i>						
Total toxic releases to total assets	0.2418	0.4863	0.2381	0.2153	0.0228	(0.7543)
Number of facilities	1.4774	0.8385	1.7213	1.2877	0.4336***	(8.7232)
<i>Corporate Governance</i>						
Share of outside directors	0.8079	0.1052	0.8152	0.8104	0.0048	(1.6205)
Share of female directors	0.0955	0.1025	0.1097	0.0794	0.0303***	(10.0633)
Share of female outside directors	0.1087	0.1185	0.1242	0.0902	0.034***	(9.8061)
Board size	8.2982	1.8914	8.5914	8.1004	0.4909***	(8.4008)
<i>Government Enforcement Actions</i>						
Environmental Violations	0.0433	0.216	0.0809	0.0162	0.0647***	(8.3076)
Social Violations	0.0353	0.1902	0.0596	0.0161	0.0435***	(7.2095)
Governance Violations	0.0019	0.039	0.0039	0.0028	0.0011	(0.5891)

**Table 4**  
**Firm ESG Coverage and ESG Performance**

Our initial sample consists of all firms with existing coverage by at least one ESG rating agency. Afterwards, we identify the subset of firms that receive additional coverage by another agency and could be matched to firms from the initial sample that did not receive the additional coverage and exhibits similar propensity scores. This group of firms constitutes our treatment group, while their five closest matched counterparts – our control group. The table reports coefficient estimates and t-statistics from OLS regressions of firm ESG performance variables on Treated, an indicator variable equal to 1 for treated firms; Post, an indicator variable equal to 1 for the inclusion year and all subsequent years; and Treated \* Post. The dependent variables are the natural log of one plus normalized ESG, E, S, G, or "X" score based on MSCI KLD. All firms are followed from 5 years before until 5 years after coverage expansion. All models include industry and year fixed effects. Standard errors are clustered at the firm level. All variables are detailed in the Appendix. The last two rows report the total number of observations and adjusted R-squared of each regression. (\*\*\*), (\*\*), and (\*) indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

	ESG score	E score	S score	G score	"X" score
	(1)	(2)	(3)	(4)	(5)
Treated	-0.0053 (-0.3961)	-0.03*** (-3.6325)	0.0207 (1.3992)	-0.016 (-1.3284)	-0.0073 (-1.1282)
Post	0.0133 (0.4064)	0.0129 (0.8227)	0.0778*** (3.2111)	-0.0298* (-1.9485)	0.0089 (0.6854)
<b>Treated * Post</b>	<b>0.0837***</b> <b>(3.0946)</b>	<b>0.0391*</b> <b>(1.9117)</b>	<b>0.0466**</b> <b>(2.3461)</b>	<b>0.0403**</b> <b>(2.3242)</b>	<b>0.0134</b> <b>(0.9767)</b>
Year and Industry fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	37957	37957	37957	37957	37957
Adjusted R-squared	0.5631	0.7271	0.4994	0.3594	0.5311



**Table 5**

**Firm ESG Coverage and ESG Performance: Additional Evidence**

Our initial sample consists of all firms with existing coverage by at least one ESG rating agency. Afterwards, we identify the subset of firms that receive additional coverage by another agency and could be matched to firms from the initial sample that did not receive the additional coverage and exhibits similar propensity scores. This group of firms constitutes our treatment group, while their five closest matched counterparts – our control group. The table reports coefficient estimates and t-statistics from OLS regressions of firm ESG performance variables on Treated, an indicator variable equal to 1 for treated firms; Post, an indicator variable equal to 1 for the inclusion year and all subsequent years; and Treated \* Post, an interaction of Treated and Post. In models (1) - (3), the dependent variable is the natural log of one plus normalized firm ESG score based on MSCI KLD, while in model (4), the dependent variable is the mean ESG score based on MSCI KLD, Sustainalytics, and Bloomberg normalized scores. All firms are followed from 5 years before until 5 years after coverage expansion. All models include industry and year fixed effects. Standard errors are clustered at the firm level. All variables are detailed in the Appendix. The last two rows report the total number of observations and adjusted R-squared of each regression. (\*\*\*), (\*\*), and (\*) indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

	ESG score	ESG score	ESG score	Mean ESG score
	(1)	(2)	(3)	(4)
Intercept	3.8518*** (93.0891)	3.3588*** (57.15)	3.4603*** (299.59)	3.0643*** (47.445)
Treated	-0.0189 (-1.397)	-0.04810*** (-3.50)	0.0060 (0.49)	0.0096 (0.6715)
Post	-0.0274 (-0.8691)	-0.09925** (-2.77)	0.0468* (2.03)	0.1501*** (4.9627)
<b>Treated * Post</b>	<b>0.0755*** (2.9272)</b>	<b>0.0938*** (3.51)</b>	<b>0.0482* (2.36)</b>	<b>0.1432*** (5.9856)</b>
Year fixed effects	Yes	Yes		Yes
Industry fixed effects	Yes			Yes
Agency fixed effects	Yes			
Index fixed effects	Yes			
Firm fixed effects		Yes		
Year-Industry fixed effects			Yes	
Observations	37957	37957	37957	40755
Adjusted R-squared	0.5995	0.7680	0.6477	0.4248

**Table 6**  
**Firm ESG Coverage and Environmental Pollution**

Our initial sample consists of all firms with existing coverage by at least one ESG rating agency. Afterwards, we identify the subset of firms that receive additional coverage by another agency and could be matched to firms from the initial sample that did not receive the additional coverage and exhibits similar propensity scores. This group of firms constitutes our treatment group, while their five closest matched counterparts – our control group. The table reports coefficient estimates and t-statistics from OLS regressions of firm toxic releases variables on Treated, an indicator variable equal to 1 for treated firms; Post, an indicator variable equal to 1 for the inclusion year and all subsequent years; and Treated \* Post. The dependent variables are natural log of one plus firm total toxic releases scaled by toxicity divided by total assets and number of reporting facilities in a company. All firms are followed from 5 years before until 5 years after coverage expansion. All models include industry and year fixed effects. Standard errors are clustered at the firm level. All variables are detailed in the Appendix. The last two rows report the total number of observations and adjusted R-squared of each regression. (\*\*\*), (\*\*), and (\*) indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

	Total toxic releases to total assets	Number of facilities
	(1)	(2)
Treated	0.1003* (1.9206)	0.3236*** (3.3812)
Post	-0.1128* (-1.909)	0.3585*** (3.0549)
<b>Treated * Post</b>	<b>-0.0601**</b> <b>(-1.9684)</b>	<b>-0.0611</b> <b>(-0.7171)</b>
Year and Industry fixed effects	Yes	Yes
Observations	10083	10083
Adjusted R-squared	0.2493	0.2684

**Table 7**

**Firm ESG Coverage and Corporate Board Structure**

Our initial sample consists of all firms with existing coverage by at least one ESG rating agency. Afterwards, we identify the subset of firms that receive additional coverage by another agency and could be matched to firms from the initial sample that did not receive the additional coverage and exhibits similar propensity scores. This group of firms constitutes our treatment group, while their five closest matched counterparts – our control group. The table reports coefficient estimates and t-statistics from OLS regressions of firm toxic releases variables on Treated, an indicator variable equal to 1 for treated firms; Post, an indicator variable equal to 1 for the inclusion year and all subsequent years; and Treated \* Post. The dependent variables are natural log of one plus the share of outside directors, the share of female directors, the share of female outside directors, and board size. All firms are followed from 5 years before until 5 years after coverage expansion. All models include industry and year fixed effects. Standard errors are clustered at the firm level. All variables are detailed in the Appendix. The last two rows report the total number of observations and adjusted R-squared of each regression. (\*\*\*), (\*\*), and (\*) indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

	Share of outside directors	Share of female directors	Share of female outside directors	Board Size
	(1)	(2)	(3)	(4)
Treated	0.0085 (1.1135)	0.0171*** (2.7613)	0.0186*** (2.6162)	0.4568*** (4.3793)
Post	0.0192 (1.4333)	0.0127 (1.6089)	0.0116 (1.2558)	0.8571*** (5.2462)
<b>Treated * Post</b>	<b>-0.0023</b> <b>(-0.3241)</b>	<b>0.0145**</b> <b>(2.2005)</b>	<b>0.0175**</b> <b>(2.1216)</b>	<b>-0.2273*</b> <b>(-1.8546)</b>
Year and Industry fixed effects	Yes	Yes	Yes	Yes
Observations	41161	41161	41161	41161
Adjusted R-squared	0.1399	0.1602	0.1594	0.1618

**Table 8****Firm ESG Coverage and Government Enforcement Actions**

Our initial sample consists of all firms with existing coverage by at least one ESG rating agency. Afterwards, we identify the subset of firms that receive additional coverage by another agency and could be matched to firms from the initial sample that did not receive the additional coverage and exhibits similar propensity scores. This group of firms constitutes our treatment group, while their five closest matched counterparts – our control group. The table reports coefficient estimates and t-statistics from OLS regressions of firm government enforcement actions on Treated, an indicator variable equal to 1 for treated firms; Post, an indicator variable equal to 1 for the inclusion year and all subsequent years; and Treated \* Post. The dependent variables are natural log of one plus the number of government enforcement actions related to firm environment, social, and governance violations. All firms are followed from 5 years before until 5 years after coverage expansion. All models include industry and year fixed effects. Standard errors are clustered at the firm level. All variables are detailed in the Appendix. The last two rows report the total number of observations and adjusted R-squared of each regression. (\*\*\*), (\*\*), and (\*) indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

	Environmental violations	Social violations	Governance violations
	(1)	(2)	(3)
Treated	0.0544*** (5.7596)	0.0892*** (5.9463)	0.0009 (0.7736)
Post	0.0377 (1.5428)	0.0898** (2.1202)	-0.0011 (-0.8551)
<b>Treated * Post</b>	<b>0.0026</b> <b>(0.1657)</b>	<b>-0.033***</b> <b>(-3.1256)</b>	<b>0.0009</b> <b>(0.6784)</b>
Year and Industry fixed effects	Yes	Yes	Yes
Observations	44134	44134	44134
Adjusted R-squared	0.1345	0.0379	0.0051

**Table 9**  
**Firm Strategic Responses to ESG Coverage**

Our initial sample consists of all firms with existing coverage by at least one ESG rating agency. Afterwards, we identify the subset of firms that receive additional coverage by another agency and could be matched to firms from the initial sample that did not receive the additional coverage and exhibits similar propensity scores. This group of firms constitutes our treatment group, while their five closest matched counterparts – our control group. The table reports coefficient estimates and t-statistics from OLS regressions of firm strategic response variables on Treated, an indicator variable equal to 1 for treated firms; Post, an indicator variable equal to 1 for the inclusion year and all subsequent years; and Treated \* Post, an interaction of Treated and Post. The dependent variables are the natural log of one plus the number of ESG-related words in firm 10-K filing, acquisition expenditures, the number of deals, and average target firms' ESG score. All firms are followed from 5 years before until 5 years after the coverage expansion. All models include industry and year fixed effects. Standard errors are clustered at the firm level. All variables are detailed in the Appendix. The last two rows report the total number of observations and adjusted R-squared of each regression. (\*\*\*), (\*\*), and (\*) indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

	ESG words in 10-Ks	Acquisition expenditures	Number of Deals	Target firms' ESG score
	(1)	(2)	(3)	(4)
Treated	0.0052 (0.1415)	0.0024 (1.1547)	0.0259* (1.8619)	-0.0503 (-1.194)
Post	0.1273*** (2.876)	-0.0015 (-0.6102)	0.0411** (2.2849)	-0.0643 (-0.9202)
<b>Treated * Post</b>	<b>0.1233**</b> <b>(2.4999)</b>	<b>0.0029</b> <b>(1.1656)</b>	<b>0.0117</b> <b>(0.8029)</b>	<b>0.161*</b> <b>(1.8107)</b>
Year and Industry fixed effects	Yes	Yes	Yes	Yes
Observations	24150	44134	44134	1909
Adjusted R-squared	0.5544	0.0478	0.071	0.2688

**Table 10**  
**Firm ESG Coverage and Institutional Ownership**

Our initial sample consists of all firms with existing coverage by at least one ESG rating agency. Afterwards, we identify the subset of firms that receive additional coverage by another agency and could be matched to firms from the initial sample that did not receive the additional coverage and exhibits similar propensity scores. This group of firms constitutes our treatment group, while their five closest matched counterparts – our control group. The table reports coefficient estimates and t-statistics from OLS regressions of firm institutional ownership variables on Treated, an indicator variable equal to 1 for treated firms; Post, an indicator variable equal to 1 for the inclusion year and all subsequent years; and Treated \* Post. The dependent variables are the natural log of one plus the percentage of institutional ownership, the number of institutional investors, and the ownership share for institutions with a preference for high-/low-ESG stocks. All firms are followed from 5 years before until 5 years after coverage expansion. All models include industry and year fixed effects. Standard errors are clustered at the firm level. All variables are detailed in the Appendix. The last two rows report the total number of observations and adjusted R-squared of each regression. (\*\*\*), (\*\*), and (\*) indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

	Share of institutional ownership	Number of institutional owners	Ownership % of institutions with high-ESG preference	Ownership % of institutions with low-ESG preference
	(1)	(2)	(3)	(4)
Treated	0.0028 (0.3806)	0.1322*** (3.8893)	0.0244*** (2.9067)	-0.0196*** (-2.6086)
Post	0.0085 (0.6507)	0.21*** (3.6408)	0.0359** (2.3354)	-0.0269* (-1.8488)
<b>Treated * Post</b>	<b>0.0138*</b> <b>(1.895)</b>	<b>0.1075**</b> <b>(2.2658)</b>	<b>0.0156**</b> <b>(2.0458)</b>	<b>-0.0044</b> <b>(-0.647)</b>
Year and Industry fixed effects	Yes	Yes	Yes	Yes
Observations	43058	43282	43079	43102
Adjusted R-squared	0.0826	0.159	0.2584	0.4083

**Table 11**  
**Firm ESG Coverage and Firm Performance**

Our initial sample consists of all firms with existing coverage by at least one ESG rating agency. Afterwards, we identify the subset of firms that receive additional coverage by another agency and could be matched to firms from the initial sample that did not receive the additional coverage and exhibits similar propensity scores. This group of firms constitutes our treatment group, while their five closest matched counterparts – our control group. The table reports coefficient estimates and t-statistics from OLS regressions of firm operating performance variables on Treated, an indicator variable equal to 1 for treated firms; Post, an indicator variable equal to 1 for the inclusion year and all subsequent years; and Treated \* Post. The dependent variables are percentage natural log of one plus Market-to-book ratio, Tobin’s Q, Price-to-earnings ratio, and 12-month return. All firms are followed from 5 years before until 5 years after coverage expansion. All models include industry and year fixed effects. Standard errors are clustered at the firm level. All variables are detailed in Appendix A. The last two rows report the total number of observations and adjusted R-squared of each regression. (\*\*\*), (\*\*), and (\*) indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

	Market-to- book ratio	Tobin’s Q	Price-to- earnings ratio	12-month return
	(1)	(2)	(3)	(4)
Treated	0.0422 (0.897)	0.157* (1.8312)	-0.0088 (-0.684)	0.0249*** (2.9167)
Post	-0.1325 (-1.5063)	-0.1757 (-1.2758)	-0.0636** (-2.0423)	-0.052*** (-2.9782)
<b>Treated * Post</b>	<b>0.1591**</b> <b>(2.1023)</b>	<b>0.1479*</b> <b>(1.9002)</b>	<b>0.0707*</b> <b>(1.9024)</b>	<b>0.0238</b> <b>(1.3581)</b>
Year and Industry fixed effects	Yes	Yes	Yes	Yes
Observations	44102	44134	44133	44109
Adjusted R-squared	0.1673	0.1481	0.1452	0.2577

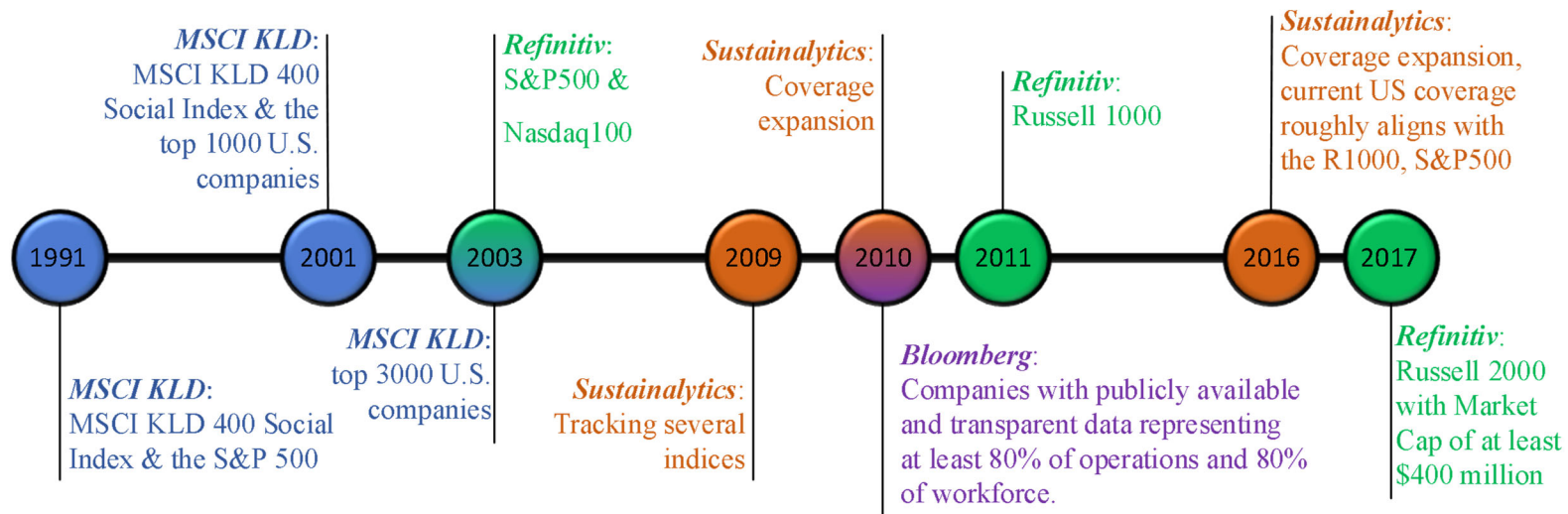
**Table 12**

**Firm ESG Coverage Effects: Lead-and-Lags Regressions**

Our initial sample consists of all firms with existing coverage by at least one ESG rating agency. Afterwards, we identify the subset of firms that receive additional coverage by another agency and could be matched to firms from the initial sample that did not receive the additional coverage and exhibits similar propensity scores. This group of firms constitutes our treatment group, while their five closest matched counterparts – our control group. The table reports coefficient estimates and t-statistics from OLS regressions of firm outcome variables on Treated, an indicator variable equal to 1 for treated firms; a series of indicators t for each year in the sample relative to the coverage expansion, excluding t0 (coverage expansion year), which is taken as the baseline; a series of interactions of treated and years relative to the coverage expansion Treated \* t, excluding Treated\*t0, which is taken as the baseline. The dependent variables are the MSCI KLD ESG score, the mean ESG score based on MSCI KLD, Sustainalytics, and Bloomberg normalized scores, the natural log of one plus the number of institutional owners, and the natural log of one plus Market-to-Book ratio. All firms are followed from 5 years before until 5 years after coverage expansion. All models include industry and year fixed effects. Standard errors are clustered at the firm level. All variables are detailed in Appendix A. The last two rows report the total number of observations and adjusted R-squared of each regression. (\*\*\*), (\*\*), and (\*) indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

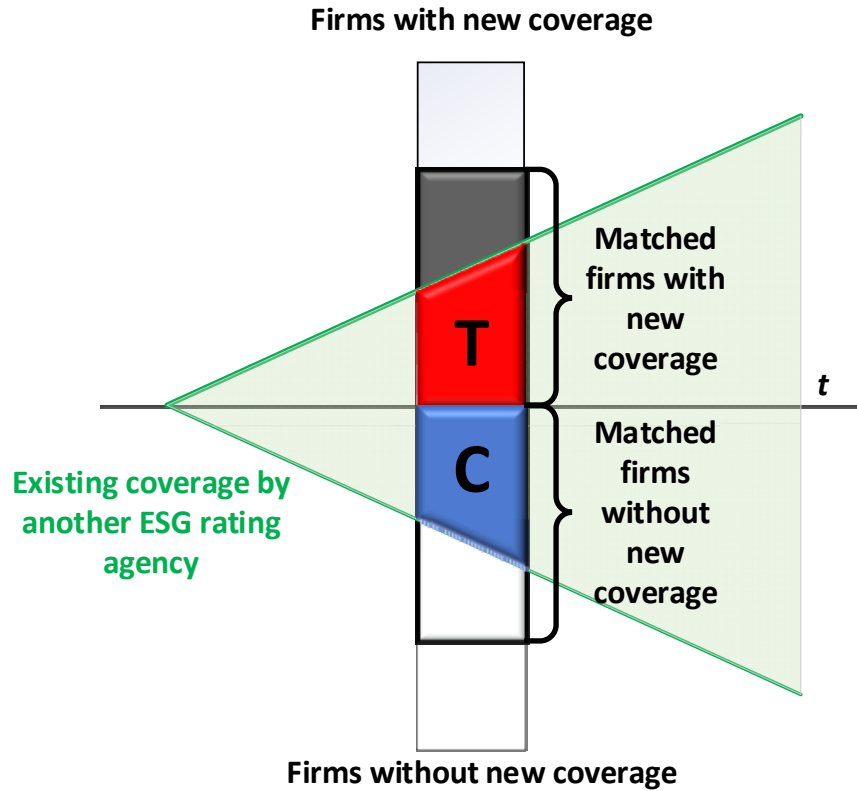
	ESG score	Mean ESG score	Number of institutional owners	Market-to-book ratio
	(1)	(2)	(3)	(4)
Treated * t-4	-0.0226 (-1.2503)	-0.0153 (-0.8107)	0.0135 (0.3718)	-0.0206 (-0.4484)
Treated * t-3	-0.0028 (-0.1938)	-0.0027 (-0.1135)	0.0316 (1.3342)	-0.0175 (-0.3941)
Treated * t-2	0.0032 (0.1978)	-0.0226* (-1.8511)	-0.0072 (-0.3704)	0.0102 (0.2131)
Treated * t-1	-0.0165 (-1.4068)	-0.0235** (-2.2275)	-0.005 (-0.4073)	-0.0057 (-0.1551)
Treated * t+1	<b>0.1300***</b> <b>(3.1679)</b>	<b>0.1035***</b> <b>(3.8371)</b>	<b>0.0677***</b> <b>(3.1148)</b>	<b>0.1236***</b> <b>(2.7511)</b>
Treated * t+2	<b>0.0734**</b> <b>(2.2843)</b>	<b>0.0712**</b> <b>(2.5517)</b>	<b>0.0959***</b> <b>(2.7683)</b>	<b>0.1031*</b> <b>(1.9147)</b>
Treated * t+3	0.0005 (0.0185)	<b>0.1304***</b> <b>(4.6074)</b>	<b>0.0896**</b> <b>(2.4098)</b>	0.0884 (1.0826)
Treated * t+4	0.0426 (1.3399)	<b>0.1866***</b> <b>(3.5507)</b>	<b>0.1855**</b> <b>(2.0427)</b>	0.1551 (1.6042)
Treated * t+5	<b>0.0554*</b> <b>(1.838)</b>	<b>0.1790***</b> <b>(4.0556)</b>	0.1612 (1.5613)	0.3613 (1.351)
Year and Industry fixed effects	Yes	Yes	Yes	Yes
Observations	37957	40755	43282	44102
Adjusted R-squared	0.5716	0.4429	0.1655	0.1715





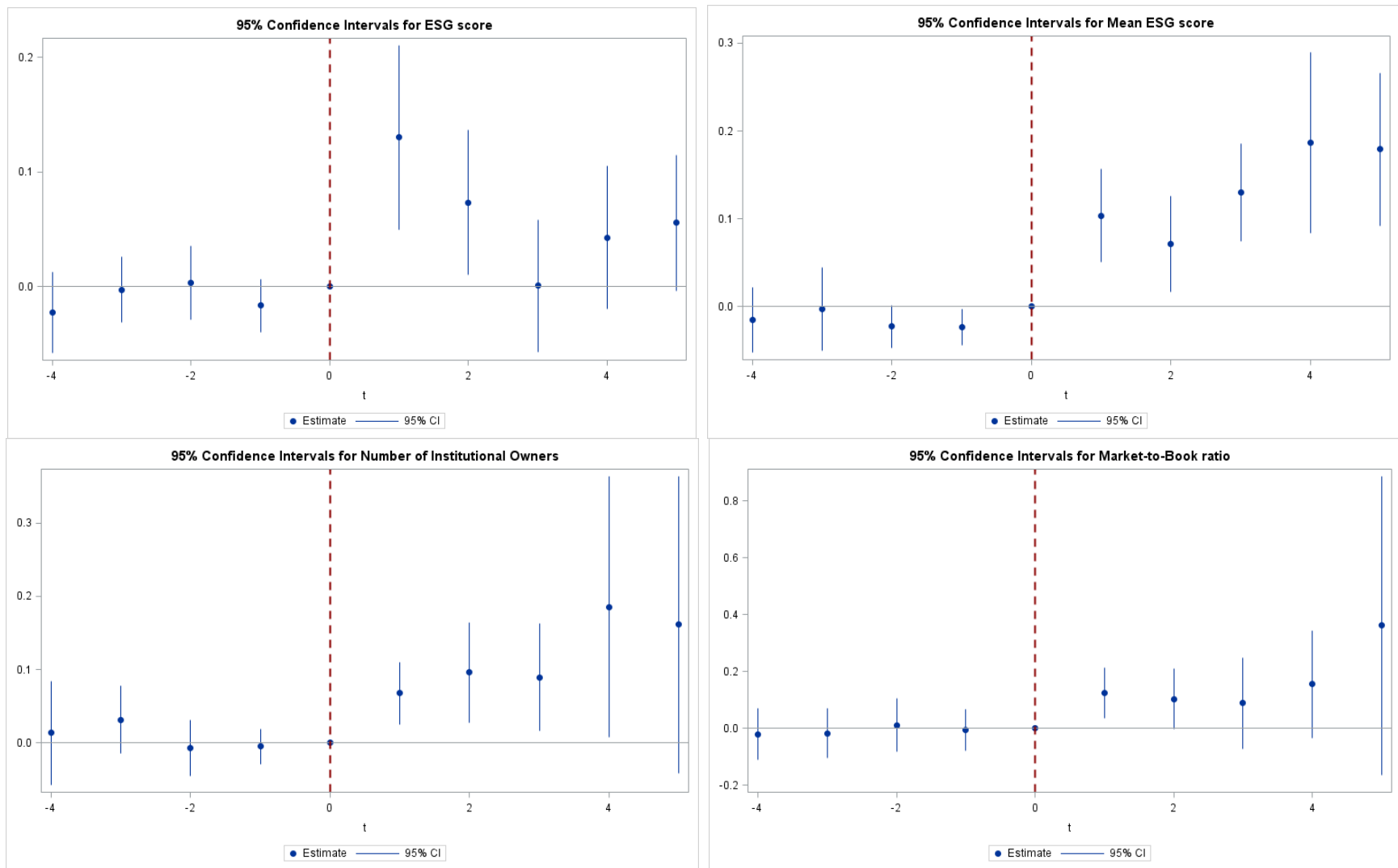
**Figure 1 – ESG Coverage Expansion Timeline**

This figure presents the timeline for ESG coverage initiations and expansions of the four major ESG rating providers analyzed in the paper. The circle indicates the year of coverage initiation or expansion for a specific group of firms, while the description states the inclusion criteria used.



**Figure 2 – Construction of the Treatment and Control Groups**

This figure visualizes the sample construction procedure. Out of the CRSP-Compustat universe, we select all firms with existing coverage by at least one ESG rating agency. Afterwards, we identify the subset of firms that receive additional coverage by another agency and could be matched to firms from the initial sample that did not receive the additional coverage and exhibits similar propensity scores. This group of firms constitutes our treatment group, while their five closest matched counterparts – our control group.



**Figure 3 – Leads and Lags Plot of ESG coverage effect 5 years around the initiation**

This figure presents the average ESG score for treated and control firms around the time an additional coverage was initiated by an ESG rating agency (time 0). Coefficients and 95% confidence intervals are from the Table 12 regressions. The vertical line separates the pre- from the post- ESG coverage initiation period.