CSR Disclosures and Firm Value: Disentangling the Role of ESG Rating Providers

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Abstract

We study the impact on firm valuation of a novel exogenous shock to environmental, social, and governance (ESG) data that affects how firms' corporate social responsibility (CSR) performance is measured. Our analysis reveals that firms that get their CSR ratings artificially boosted by a change in ESG reporting methodology tend to have significantly higher changes in firm values. These results are robust to alternative measures of CSR ratings and unaffected by firms' unobservable characteristics. Moreover, we find that firms with low capital constraints and low institutional ownership tend to benefit most from improved CSR ratings when ESG reporting is revamped. These findings provide insight into how ESG rating providers could influence and shape firms' actual CSR engagement.

Keywords: Corporate Social Responsibility, ESG criteria, Rating methodology, Firm Valuation, Sustainability

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"Corporate social responsibility is a hard-edged business decision.
Not because it is a nice thing to do or because people are forcing us to do it
[...] but because it is good for our business."

Niall FitzGerald[1]

1. Introduction

The recent COVID-19 crisis has reinvigorated interest in understanding how and why corporate social responsibility (CSR) and environmental, social, and governance (ESG) performance mitigate risk and create long-term firm value (Albuquerque et al., 2020; Bhattacharya et al., 2021; Ding et al., 2021). In this context, the role of intermediaries that collect information on CSR disclosures and provide ESG ratings should come under scrutiny, particularly regarding the role they might play in creating value. However, despite the CSR–valuation relationship being extensively studied in the past (Lins et al., 2017), the role played by ESG rating providers in shaping that relationship remains largely unexplored. This study fills this gap in literature.

Indeed, the evaluation of firms' CSR performance by ESG rating providers not only depends on the firms' actual CSR engagement, but also on their choice of rating methodology. The proprietary rating methodologies employed by ESG data providers are independent of firms' ESG engagement, which can sometimes result in heterogeneous ESG measures for the same firm (Christensen et al., 2022; Serafeim and Yoon, 2022). Assuming relevant CSR disclosures at the firm level and informational efficiency at the market level, any change in firms' CSR activities should result in a change in their valuation. However, information on firms' CSR activities is not only conveyed to investors through the evaluation of CSR performance by ESG rating providers, but can also be made available through other communication channels. For instance, firms can use social media marketing to reach stakeholders, which can also impact firm valuation (Yang and Basile, 2021). Moreover, firms' CSR disclosures and CSR performance measures provided by

[1] As quoted in an interview given to *The Guardian* in 2003.

ESG rating providers are also fundamentally endogenous to any release of information on the firms' actual financing and operating activities that are relevant to their valuation (for a review, see Gillan et al., 2021). Therefore, the empirical identification of whether the information conveyed by ESG rating providers matters to firm valuation is challenging.

Thus far, the literature has focused on how changes in firms' actual CSR activities would result in a positive outlook from its existing CSR disclosures and, in turn, affect firm valuations. To do so, several studies have instrumented for actual CSR engagement using industry-average CSR ratings or other firm-specific determinants (Jiao, 2010; Awaysheh et al., 2020; Zhang et al., 2021), firms' political affiliations (Di Giuli and Kostovetsky, 2014), or CSR-focused regulatory changes, such as the adoption of state-level "Other Constituency Statutes" (Cremers et al., 2019; Dumitrescu et al., 2020). However, these studies do not disentangle the effect on firm valuation of the exogenous component of CSR performance indicators (the specific methodology used by each ESG rating provider) from the effect of the endogenous component (firms' CSR disclosures). Isolating the effect of a change in ESG ratings on firm valuation notwithstanding the firms' actual CSR engagements could also help better understand the nature and magnitude of the incentive provided by ESG ratings to firms to prioritize certain CSR actions. However, this effect can not be isolated unless a change in rating methodology occurs and can be observed. This observation could either be made from direct and transparent communication by ESG rating providers about the aforementioned change or could require the detection of a generalized change in ESG ratings when the evaluated firms' CSR engagement remains unchanged.

We found that one such change occurred in 2010, when MSCI (formerly KLD RiskMetrics), one of the largest ESG rating providers, decided to modify its ESG data collection criteria. This change resulted in a quasi-experimental setting that provides a unique opportunity to capture the impact of an exogenous shock on ESG ratings unrelated to firms' actual CSR engagement. Before 2010, ESG data collected by MSCI involved an assessment of a list of requisite ESG indicators that would be the same for all firms regard-

less of their industry. However, in 2010, MSCI initiated new data collection criteria that limited the assessment to a smaller set of industry-relevant indicators. This sudden application of industry-specific assessment was partly motivated by research showing that ESG "materiality"——or its industry-specific relevance—mattered for valuation (Khan et al., 2016).

Using this exogenous shock, we study whether firms that had their ESG ratings boosted or abated from this unanticipated change in 2010 also experienced a change in firm valuation attributable to this change. If so, this would confirm that the rating shock resulted in a change in how these firms' CSR outlook was perceived by their stakeholders and the market at large. If investors rely significantly on ESG rating providers to understand firms' CSR disclosures, this unanticipated exogenous change in ESG ratings should impact firm valuation. In contrast, if the actions of ESG rating providers are trivial and firms' actual CSR engagement is indeed the only driver of value, such unanticipated shock to CSR ratings should not affect firm valuation. These are the two competing hypotheses examined here.

Our empirical analysis employs panel regressions that account for both the time-variant and time-invariant characteristics of firms. The results show a statistically significant positive effect of the change in CSR ratings on firm value—after the change in MSCI data reporting methodology, firms with an artificially boosted ESG rating experienced on average a significantly higher change in firm valuation than firms with unaffected ESG ratings. This change was substantial in magnitude, demonstrating its economic significance. It also highlights the role of ESG rating providers as key intermediaries for aggregating and disseminating ESG information that will produce an effect on firm valuation in excess of what that information could have produced on its own. This has important implications for both firms' managers and regulators, as it shows that ESG ranking providers are conferred by their ESG evaluation tools an influence that could be wielded on the firms that they evaluate to shape these firms' CSR strategies.

Our results remain robust even when we include additional institutional investor- and

manager- specific control variables in our analysis to account for potential time-variant omitted variables. We also addressed several possible threats to the internal validity of our inferences. First, since in our setting the number of firms in the control group (i.e., the firms whose CSR rating remains unaffected from 2009 to 2010 due to the update in MSCI methodology) is much lower than in the treatment group (i.e., the firms whose CSR rating varies as a result of the update), we employ a propensity score (PS) matched treatment group for our control group firms. This also accounts for any selection bias that could result from systematic differences in the observable characteristics of firms in the treatment and control groups. For instance, if profitability were such a characteristic, high-profitability firms would be more likely to have their ESG ratings impacted by the MSCI methodology change than low-profitability firms, which in turn would be more valuable. This is controlled for with PS matching. Second, the impact of the variation in ESG ratings between the control and treatment groups' firms may not necessarily be driven by the methodology change, but may simply be a case of the difference in the valuations of stable CSR policy firms versus those firms that employ a variable CSR policy. In other words, if this is indeed the case, similar valuation impacts would exist regardless of the MSCI methodology update. To account for this, we conducted placebo experiments. Our inferences are unaffected despite accounting for these internal validity threats.

Do we capture the valuation effects of a random shock to CSR ratings or a concerted effort by firms to consciously change their CSR strategies? To alleviate this concern related to the exogeneity and relevance of our quasi-natural experiment, we conduct an additional test that exploits the differences in how the 2010 MSCI methodology update affected the ESG strengths and concerns indicators. Although both these sets of indicators were assessed using a smaller industry-specific criteria from 2010 onwards instead of an all-inclusive assessment in prior years, the methodology applied for ESG concerns was reverted in 2012 to the older approach. Thus, by disaggregating CSR strengths and concerns from the broader CSR rating, we can test whether what gets captured is indeed

the valuation impact of an exogenous shock to CSR ratings. Our results support the reliability of our quasi-natural experiment. We find that the treatment effect is seen only for CSR strengths but not for CSR concerns.

From a firm's perspective, the valuation benefits stemming from CSR engagement may be the result of a better reputation and goodwill (Servaes and Tamayo, 2013; Eccles et al., 2014), lower product market competition (Gregory et al., 2016; Albuquerque et al., 2019), improved insurance and risk mitigation (McGuire et al., 1988; Godfrey et al., 2009; Cai et al., 2016), or better stakeholder engagement (Hillman and Keim, 2001; Jiao, 2010; Allen et al., 2015). However, the value-driving mechanisms are not clear from the perspective of ESG rating providers. Thus, we seek to shed light on the underlying mechanisms that could explain why the value relevance of ESG rating providers' data collection and reporting is important for firms. We do so by examining firms' capital constraints and governance characteristics. Our results show that firms with lower capital constraints and low institutional ownership tend to benefit the most from the shock in CSR ratings. These findings corroborate the importance of capital access in CSR investments (Cheng et al., 2014) and the complementary view of CSR and governance (Ferrell et al., 2016; Bartov et al., 2021). Together, these findings point to the critical role of capital availability and managerial freedom in shaping value-driven CSR ratings, even in the presence of third-party ESG data providers.

The remainder of this paper is organized as follows. Section 2 provides a detailed theoretical background of the literature and the proposed approach. Section 3 presents our data and the methodology employed in the empirical analysis. In section 4, we present our results from a quasi-natural experiment and discuss their implications. In Section 5, we highlight the underlying mechanisms that could explain the value relevance of ESG ratings. Finally, Section 6 discusses the main findings and concludes the paper.

2. Literature Review

2.1. The impact of CSR engagement on firm value

CSR investments and engagement are important for firms to maintain a healthy relationship with all stakeholders, including employees, customers, suppliers, and society. Anticipating whether the expenditures incurred by CSR engagement will benefit the firm requires an understanding of the links between all stakeholders' interests. On the one hand, some researchers consider stakeholder orientation and welfare maximization a fundamental reflection of firms' shareholder wealth maximization objective (e.g., Ferrell et al., 2016; Fernando et al., 2017). This view implies that the complementarity between shareholders' and other stakeholders' interests should essentially increase CSR investments, resulting in an enhancement of firm value. On the other hand, based on Friedman's (1970) view, CSR can be considered an unnecessary cost that could potentially erode firms' profits, harming their shareholders. Thus, increased CSR investments would result in some destruction of shareholder value (see for instance Bartov et al., 2021).

Despite the apparent contradictions between these views, both have been corroborated by empirical evidence. Nevertheless, the positive impact of CSR engagement on valuation has been documented more frequently in recent years (Gillan et al., 2021). In particular, when firms ensure that their shareholders' interests are well aligned with those of other stakeholders, CSR activities can create value for firms either through indirect positive externalities that affect their reputation and brand image (Servaes and Tamayo, 2013; Gong and Grundy, 2017) or through their competitive advantage (Gregory et al., 2016; Albuquerque et al., 2019). Direct benefits could even arise from CSR engagement when firms are protected during economic downturns through the insurance-like safety net provided by the risk-mitigating properties of CSR (Cai et al., 2016; Dumitrescu and Zakriya, 2021), or due to its ability to counter managerial short-termism (Louche, 2009; Bénabou and Tirole, 2010) and managerial wrongdoing (Kim et al., 2012; Gao et al., 2014).

2.2. The challenge of isolating the valuation benefits of CSR

Recent empirical studies have shown that firms with better CSR engagement have relatively higher valuations than those with poor CSR engagement. However, understanding the true value relevance of CSR engagement and ESG ratings is complicated by several factors.

First, it is common to observe different ESG ratings for the same firm (Christensen et al., 2022). Such differences can be explained by the fact that the various ESG rating providers, such as MSCI, Sustainalytics, or Refinitiv for instance, employ different methodologies to evaluate the firms' CSR performance after their initial collection of ESG data. In addition, while all ESG rating providers agree on the importance of non-financial ESG disclosures, they have no common understanding of what they actually represent (Kotsantonis and Serafeim, 2019).

Second, ESG indicators encompass a wide variety of broad-based stakeholder characteristics that are not always easy to assess together. Measurement problems can arise for instance when ESG indicators include exemplary ESG behavior (ESG strengths) and controversial ESG behavior (ESG concerns) together at the same time. In addition, the value relevance of CSR may not be driven by all ESG indicators in all three E, S, and G sub-dimensions, but only by a few of them (Khan et al., 2016). Some studies have attempted to overcome this issue by disaggregating ESG strengths from ESG concerns or by employing the three E, S, and G sub-dimensions within ESG separately (Galema et al., 2008; Dumitrescu and Zakriya, 2021).

Third, truly exogenous shocks to ESG ratings are hard to come by. This implies that even if a correlation is frequently observed between CSR and firm valuation, causal estimation remains a challenge. Some studies have attempted to overcome this issue by using CSR-specific instrumental variables such as the industry-average CSR score or the firms' political affiliation (Jiao, 2010; Di Giuli and Kostovetsky, 2014) as well as stakeholder-oriented regulatory changes—e.g., "Other Constituency Statutes"— (Cremers et al., 2019; Dumitrescu et al., 2020). Nevertheless, while the relevance of these instrumental vari-

ables for CSR ratings can be agreed upon, it is not always easy to establish or test their exogeneity. Furthermore, the impact of stakeholder-oriented regulatory shocks on CSR ratings is difficult to assess because it may be delayed.

2.3. The value relevance of ESG rating providers beyond CSR disclosures

The importance of ESG rating providers is well-established in the literature (Yang and Basile, 2021; Christensen et al., 2022; Shanaev and Ghimire, 2022). Although the relationship between CSR and firm valuation has been widely studied (Jo and Harjoto, 2011; Lins et al., 2017; Bae et al., 2021; Dumitrescu and Zakriya, 2021), very little is known about the real value relevance of ESG rating providers beyond the impact of pure CSR information they pass on to the markets. The empirical identification of whether information conveyed by ESG rating providers matters to firm valuation is challenging: as explained in section 1, the firms' CSR disclosures and the ESG data that captures their CSR engagement are endogenous to the firms' actual CSR investments, which in turn have direct value relevance. Moreover, different "firms may [themselves] react differently to being rated" (Clementino and Perkins, 2021). This possible heterogeneity among firms' reactions to their ESG ratings further complicates any attempt to isolate the role of ESG rating providers.

Thus far, the identification strategies used in the literature have been unable to isolate the importance of the intermediary role of ESG rating providers. We address this challenge by studying a novel shock to ESG ratings independent of the firms' internal ESG actions or CSR engagement. Since our analysis involves treatment and control groups that are sharply identified using a shock to the ESG rating itself, our empirical setting allows us to see how and why unexpected shocks to ESG ratings may impact firm value. By focusing on a single ESG data source, we avoid the complexities induced by the heterogeneity of ratings that can be observed among various ESG rating providers.

If ESG rating providers' roles were limited to representative intermediation where they would simply ensure free flow of ESG information between the firm and the markets, firms' valuation should not be affected by an unexpected exogenous change in their CSR

ratings caused by a simple change in ESG evaluation methodology. The lack of an effect on firm valuation in that setting could then imply that managing CSR activities makes business sense to managers through "doing well by doing good" (Ferrell et al., 2016; Lins et al., 2017), and ESG rating providers do not have any significant role to play beyond intermediation.

However, if the intermediation of ESG rating providers brings enough added value to make it necessary for ESG information-seekers, then an exogenous change in firms' ESG ratings caused by a change in the evaluation methodology should have an effect on firm valuation. Under the assumption that shareholders' interests are aligned with other stakeholders' interests and that CSR investments should result in an enhancement of firm value, firm valuation should be positively (negatively) affected by an increase (decrease) in ESG ratings that would result from the exogenous change. Under the opposite assumption that CSR and stakeholder orientation are detrimental to shareholders' interests (following the views of Friedman, 1970; Borghesi et al., 2014), firm valuation should be negatively (positively) impacted by an increase (decrease) in ESG ratings that would result from the exogenous change.

3. Data and Methodology

3.1. CSR Ratings and Other Data

ESG ratings were obtained using MSCI-KLD ESG Stats. MSCI independently assesses companies on several parameters that can be grouped under the following categories: community, diversity, employees, environment, human rights, governance, and product. From this data, we build our own measure of CSR performance by including governance parameters to ensure that shareholders are also represented among the firms' stakeholders and to obtain a broader perspective of CSR. Indeed, the MSCI governance indicators cover CSR aspects that we deemed relevant, including business ethics and corruption. Nevertheless, as a robustness check, we follow Kim et al. (2014) and employ an alternative CSR performance measure that excludes governance and human rights indicators. Besides the ESG indicators, MSCI data include controversial business screens,

including identifiers for firms indulging in alcohol, firearms, nuclear power, military, gambling, and tobacco sales. Since these characteristics do not really represent CSR (Hillman and Keim, 2001; Dumitrescu and Zakriya, 2021), we focus on ESG indicators only. As an alternative source of ESG data, we use Bloomberg's ESG disclosure scores.

Our initial sample consists of an unbalanced panel of firm-level ESG data from 1991 to 2018 for U.S. firms. The MSCI ESG coverage has grown over the years: while it initially reported only S&P500 companies in the early 1990s, it had already expanded to almost 3,000 companies in 2018. The full MSCI sample included in this study has more than 41,000 firm-year observations of ESG ratings.

Our measure of firm valuation (an industry-standardized Tobin's Q) and firm-level control variables were obtained from COMPUSTAT and Center for Research in Security Prices (CRSP) data, as well as the proxies of capital constraint. Additional governance characteristics including the E-Index (Bebchuk et al., 2009) and institutional ownership were computed using ISS-Riskmetrics and Thomson Reuters 13f Holdings data, respectively.

3.2. Dependent Variable

Tobin's Q – Following Gompers et al. (2003) and Bebchuk et al. (2009), we take the ratio of market-to-book value of assets as a measure of firm valuation. We obtain the market value of assets as:

$$\begin{aligned}\text{Market value of assets} = &\ (\text{book value of assets} + \text{market value of common stock}) \\ &- (\text{book value of common stocks} + \text{deferred taxes})\end{aligned} \tag{1}$$

The corresponding industry-adjusted Tobin's Q is calculated using the difference between the firm's Tobin's Q and the median Tobin's Q of the respective 2-digit SIC (Standard Industry Classification) industry of the firm.

3.3. Independent Variables

ESG data are frequently used in the literature as proxies for stakeholder engagement (Jiao, 2010), business sustainability (Khan et al., 2016; Ng and Rezaee, 2020), social

capital (Lins et al., 2017), and CSR (Bae et al., 2021; Dumitrescu and Zakriya, 2021). The most common proxies of CSR performance calculated from ESG data are composite measures that present the advantage of providing a single value that can be used to compare firms. The first measure is simply the difference between the sum of "ESG strengths" and the sum of "ESG concerns." The second measure builds on the latter and standardizes it by industry, which ensures year-on-year comparison for firms when the number of ESG indicators assessed by the MSCI vary over time (Lins et al., 2017; Dumitrescu and Zakriya, 2021). We used both measures in parallel in our tests. We also segregate the strengths and concerns indicators to study whether any asymmetry can be observed in their impact on valuation (Flammer, 2015). Thus, our measures of CSR performance are calculated as follows:

CSRs / CSRc – We use measures of CSR strengths ($CSRs$) and concerns ($CSRc$) following Jha and Cox (2015), meaning that for each firm, $CSRs$ adds up all MSCI-KLD "ESG strengths" and $CSRc$ adds up all MSCI-KLD "ESG concerns."

CSR – This variable measures the net CSR performance of a firm in a given year. It is calculated as the difference between the ESG strengths and concerns:

$$CSR = CSRs - CSRc \tag{2}$$

SCSRs / SCSRc – The standardized CSR strengths ($SCSRs$) and standardized CSR concerns ($SCSRc$) variables are industry-adjusted equivalents to the $CSRs$ and $CSRc$ measures. Following Kim et al. (2014), the standardization of these measures requires descriptive statistics on CSR performance at the industry-level. For each firm under evaluation, the maximum and minimum CSR scores ($CSRs_{max}$ and $CSRs_{min}$, respectively) were determined from the sample firms operating in the same industry, the latter being determined following Fama and French's (1997) industry classification.

$$SCSRs = \frac{CSRs - CSRs_{min}}{CSRs_{max} - CSRs_{min}} \tag{3}$$

and

$$SCSRc = \frac{CSRc - CSRc_{min}}{CSRc_{max} - CSRc_{min}} \tag{4}$$

SCSR – The standardized CSR performance measure is the industry-adjusted equivalent of the CSR measure above. This is computed as follows:

$$SCSR = \frac{CSR - CSR_{min}}{CSR_{max} - CSR_{min}} \tag{5}$$

3.4. Control Variables

Following Bebchuk and Cohen (2005), Bhagat and Bolton (2008), and Jiao (2010), the firm-specific control variables are as follows:

ROA – Firms' operating performance measured by the Return on Assets;

Size – Firm's size measured as the logarithm of its total assets;

Leverage – The firm's long-term debt to total assets ratio;

Liquidity – A measure of firm's stock liquidity calculated as the logarithm of the volume of shares traded in a fiscal year;

CAPEX – The logarithm of the firm's capital expenditures to total assets ratio;

R&D – The logarithm of the firm's research and development expenses to total sales ratio;

Firm Age – The logarithm of number of months since the firm's first coverage in CRSP;

Incorporation – The firm's incorporation location measured by a Delaware incorporation dummy.

3.5. Sub-Sampling Variables

Cost of Debt – To measure a firm's capital constraint, we use the ratio of interest expenses to long-term debt. This measure is then winsorized at 1%.

SA Index – The Size-Age Index is used as an alternative measure of capital constraint. It is measured as a function of size and age variables following Hadlock and Pierce (2010) and Cheng et al. (2014).

Monitoring – To proxy for investor monitoring, we use the share of the company's ownership held by institutional investors. The annual average of institutional ownership available on a quarterly basis is then used, and this measure is winsorized at 1%.

E-Index – To proxy for managerial entrenchment, we use Bebchuk et al.'s (2009) E-Index that measures the presence of six entrenchment provisions (namely the limited ability to amend bylaws, the limited ability to amend charters, staggered boards, poison pills, golden parachutes, and the supermajority shareholder approval for mergers) in the firm.

The summary statistics of all these variables are presented in Table 1.

3.6. Empirical Identification

For baseline causal estimates examining the role of ESG rating providers in the CSR-valuation relationship, we focus on the year 2010. This is the year when MSCI changed its data collection methodology by focusing on industry-relevant indicators for firms' CSR performance evaluation. In other words, beyond 2010, the set of ESG indicators assessed for each sample firm was restricted to a subset of key industry-specific indicators unique to the industry of the firm under evaluation.

Firms whose ESG ratings changed from 2009 to 2010 comprise the treatment group, while firms whose ESG ratings remained constant at the time of the exogenous shock comprise the control group. To understand the rationale behind this allocation of firms to the treatment or control groups, let us consider a firm that would have been granted 20 points for ESG strengths and 10 points for ESG concerns in 2009. The firm's overall CSR score in 2009 would be 10. Assuming that only 15 of the 20 ESG strengths were industry-relevant, the subsequent CSR score in 2010 would then decrease to 5. Knowing that the ESG strengths and concerns indicators for a given firm do not change considerably from one year to the next, it can be safely assumed that the change in these scores from 2009 to 2010 can be attributed to the exogenous change in the methodology. Such a firm would then be included in the treatment group, while a lack of change would make the firm fall into the control group.

Table 1

Descriptive statistics for firm-specific variables and ESG-based measures
This table presents the summary statistics including the mean, median, standard deviation (SD), 5^{th} and 95^{th} percentiles, and total number of observations (N) for all variables used in our statistical analyses. Panel A contains all ESG ratings that serve as independent variables. Panel B contains the dependent variable and all control variables. Panel C contains the sub-sampling variables. These variables were computed from the MSCI ESG, ISS Governance, Thomson Reuters 13f, COMPUSTAT, and CRSP data. All variables measured by ratios and used in the regressions (such as Tobin's Q and ROA) are winsorized at the 1^{st} and 99^{th} percentiles in the presence of extreme outliers.

Panel A: ESG ratings

	Mean	SD	5^{th} Percentile	Median	95^{th} Percentile	N
CSR	0.09	2.40	-3.00	0.00	4.00	41792
CSRs	1.51	2.26	0.00	1.00	6.00	41792
CSRc	1.39	1.73	0.00	1.00	5.00	41792
SCSR	0.39	0.24	0.00	0.33	0.88	41701
SCSRs	0.17	0.25	0.00	0.08	0.83	41701
SCSRc	0.22	0.26	0.00	0.14	0.86	41701

Panel B: Dependent and Control Variables

	Mean	SD	5^{th} Percentile	Median	95^{th} Percentile	N
Tobin's Q	0.43	3.96	-0.94	0.02	3.05	41537
ROA	0.09	1.65	-0.10	0.10	0.28	41792
Size	7.57	1.80	4.85	7.50	10.62	41681
Leverage	0.20	0.22	0.00	0.15	0.58	41792
Liquidity	18.51	1.59	15.84	18.52	21.08	41720
CAPEX	-3.79	1.47	-6.81	-3.51	-1.88	38464
R&D	-1.15	1.83	-4.81	0.00	0.00	41792
Firm Age	5.033	1.039	0.00	5.23	6.48	40870
Incorporation	0.585	0.493	0.00	1.00	1.00	39845

Panel C: Sub-sampling Variables

	Mean	SD	5^{th} Percentile	Median	95^{th} Percentile	N
Cost of Debt	0.02	0.13	0.00	0.00	0.05	34795
SA Index	-3.69	0.56	-4.61	-3.64	-2.82	31842
Monitoring	0.72	0.22	0.30	0.76	1.00	28332
E-Index	3.30	1.34	1.00	3.00	5.00	20133

We estimated the overall treatment effect on firm valuation (our industry-adjusted Tobin's Q) using triple difference (DDD or diff-in-diff-in-diff) analysis. Although we controlled for possible confounding and alternative explanations in two of the differences within the DDD—treatment versus control group and pre- versus post-treatment periods, further inclusion of firm fixed effects ensures that all other firm-specific characteristics were also controlled for.

Main Analytical Model. Following Bebchuk et al. (2009) and Jiao (2010), all our regression models employ an industry-adjusted Tobin's Q as the dependent variable.[2] The standard empirical model in the literature is either one of the two linear regression models below, with $Q_{j,t}$ the industry-adjusted Tobin's Q of firm j in year t, with $CSR_{i,t}$ being either the raw CSR or industry-standardized SCSR rating defined earlier, with $X_{j,t}$ a column vector of all control variables, and C_1 being the related row vector of coefficients.[3] The second model differs from the first model by breaking down the $CSR_{i,t}$ variable into its two sub-components that are strengths ($CSRs_{i,t}$) and concerns ($CSRc_{i,t}$). Meanwhile, μ_j and τ_t are included to control for firm and time heterogeneity using firm and year fixed effects, respectively.

Model 1 :

$$Q_{j,t} = A_1 + B_1 * CSR_{j,t} + C_1 * X_{j,t} + \mu_j + \tau_t + \varepsilon_{j,t} \tag{6}$$

Model 2 :

$$Q_{j,t} = A_2 + B_{2a} * CSRs_{j,t} + B_{2b} * CSRc_{j,t} + C_2 * X_{j,t} + \mu_j + \tau_t + \varepsilon_{j,t} \tag{7}$$

Building on these two models, our quasi-natural experiment was modeled for analysis using the DDD estimation. Additional dummy variables $Post_{j,t}$ and $Treat_{j,t}$ represent the post-treatment period (from 2010 onwards) and firms in the treatment group, respectively.

[2]While we employed Tobin's Q adjusted by the median 2-digit SIC industry Tobin's Q for each firm in the main analyses presented in this study, we also used Fama and French's (1997) industry-adjusted Tobin's Q to run the analyses and found that our results remained unaffected.

[3]In this paper we use the subscript n for each coefficient or vector of coefficients of the n^{th} regression model. We also use lowercase for scalars and uppercase for vectors of coefficients.

We first employ the following specification (Model 3), which includes the aggregate CSR measure.

Model 3 :

$$\begin{aligned} Q_{j,t} = A_3 + B_{3,1} * CSR_{j,t} + B_{3,2} * Post_{j,t} + B_{3,3} * Treat_{j,t} + B_{3,4} * CSR_{j,t} * Post_{j,t} \\ + B_{3,5} * CSR_{j,t} * Treat_{j,t} + B_{3,6} * Post_{j,t} * Treat_{j,t} \\ + B_{3,7} * CSR_{j,t} * Post_{j,t} * Treat_{j,t} + C_3 * X_{j,t} + \mu_j + \tau_t + \varepsilon_{j,t} \end{aligned} \tag{8}$$

Next, we employ an alternative specification (Model 4) using the two CSR sub-components: $CSRs$ and $CSRc$.

Model 4 :

$$\begin{aligned} Q_{j,t} = A_4 + B_{4,1a} * CSRs_{j,t} + B_{4,1b} * CSRc_{j,t} + B_{4,2} * Post_{j,t} + B_{4,3} * Treat_{j,t} \\ + B_{4,4a} * CSRs_{j,t} * Post_{j,t} + B_{4,4b} * CSRc_{j,t} * Post_{j,t} \\ + B_{4,5a} * CSRs_{j,t} * Treat_{j,t} + B_{4,5b} * CSRc_{j,t} * Treat_{j,t} \\ + B_{4,6} * Post_{j,t} * Treat_{j,t} + B_{4,7a} * CSRs_{j,t} * Post_{j,t} * Treat_{j,t} \\ + B_{4,7b} * CSRc_{j,t} * Post_{j,t} * Treat_{j,t} + C_4 * X_{j,t} + \mu_j + \tau_t + \varepsilon_{j,t} \end{aligned} \tag{9}$$

We seek to identify the impact on Tobin's Q when there is an increase (decrease) in ESG ratings from below (above) average levels for treatment firms after MSCI adopts the new industry-relevant indicator assessment. Therefore, the coefficients of the interaction terms for each CSR and its sub-components ($CSRs$ and $CSRc$) with $Post$ and $Treat$ are the ones capturing the DDD terms. These coefficients are $B_{3,7}$ for the aggregate CSR rating, and $B_{4,7a}$ and $B_{4,7b}$, for its strengths and concerns sub-components, respectively. Note that these models focus on assessing the net impact on firm value whenever there is a change (regardless of the sign) in ESG scores after the MSCI methodology update in 2010. Hence, firms in the treatment group with either an increased or decreased ESG rating were included in the model specification.

The change in the indicator assessment rule of the MSCI is an exogenous shock to the sample of firms under evaluation. However, as the new rule assesses only some

key industry indicators, one could argue that the firms' managers could have been well-informed of which ESG indicators would be deemed relevant for their industry and could have reacted accordingly to organize firms' CSR disclosures in a manner that marginalizes the impact of the shock. We conducted placebo or falsification tests to assess whether such an anticipation indeed occurred. Furthermore, we ran PS matching to account for any selection or sampling bias borne out of the differences in size between the control and treatment groups.

Note that the main identification presented above assumes that the MSCI ESG ratings are sticky and undergo only a few changes across the years. We verified this by exploring the trends in firms' CSR ratings observed in our data. Accordingly, any exogenous change in CSR ratings in 2010 is attributed to the change in MSCI methodology. However, the rating changes in 2010 could still reflect an actual change in firms' CSR engagement if some firms indeed updated their CSR policies in the same year the MSCI methodology changed. To account for this possibility, we used Bloomberg as an alternative data source to classify firms in the control and treatment groups. In this alternative classification, we identified a subset of our sample firms that had the same Bloomberg's ESG disclosure scores for 2009 and 2010. In principle, these firms have not changed their actual ESG disclosures during these years. Among this subset of firms, treatment firms are those with a change in their MSCI data based ESG ratings from 2009 to 2010.

Sub-Sampling Tests: CSR investment and disclosure decisions are largely intrinsic to any firm; they depend on the availability of resources and, more specifically, the availability of capital (Attig et al., 2013; Cheng et al., 2014). For this reason, we examine whether the findings from our quasi-natural experiment differ between firms with high financial constraints and those with low financial constraints. To do so, we formed two sub-samples based on firms' financial constraints using first, their cost of debt (COD) and second, their SA Index. Firms were then categorized into low constrained and high constrained subgroups. Next, to understand the role of governance characteristics in affecting the

value-enhancing ability of CSR ratings, we used two proxies of managerial freedom: institutional ownership (to mirror shareholders' monitoring behavior), and the E-Index (Bebchuk et al., 2009). Similar to the sub-sampling done with the proxies of financial constraints, we identify median-based sub-samples for each of these two variables.

4. Main Results

Table 2 shows the results of all the main DDD estimations. The baseline results show that an improvement in CSR due to the sudden application of industry-specific assessment has a positive effect on firm valuation, regardless of the measure we use for the ESG ratings (either raw or industry-standardized). Most importantly, the coefficients of the DDD terms are statistically significant, supporting a causal link with firm valuation.

Although the strengths and concerns indicators' assessment was industry-specific from 2010 onwards, starting in 2012 the assessment regarding concerns was reverted to being all inclusive (not just industry-specific). Thus, by disaggregating strengths and concerns sub-components, we can test the reliability of the identified treatment. Indeed, our results in Table 3 corroborate the exogeneity of the shock to the CSR ratings as only the strengths sub-component $CSRs$ show a statistically significant DDD term but not the concerns sub-component $CSRc$. In an additional unreported analysis, we restricted the sample observations to the period ending in 2011 and again found confirmatory evidence of treatment reliability. In this shortened sample period, both the strengths and concerns sub-components have a significant impact on firm value.

4.1. Internal Validity

To address the threats to the internal validity of our inferences from this quasi-natural experiment in terms of selection biases and counterfactuals, we employed propensity score (PS) matching for the treatment firms and additional placebo tests. These different results are shown in Tables 2 and 3, along with the baseline results.

Despite controlling for firm characteristics $X_{j,t}$ and the additional firm fixed effects, concerns remain regarding the nonequivalence of the treatment and control groups with

Table 2

Do exogenous shocks to ESG aggregate ratings cause changes in Tobin's Q?
This table reports the results of multiple triple difference (DDD) estimations of the impact of changes in ESG measures on Tobin's Q. All regressions in Panel A are estimated using Model 3. The independent variable is either raw CSR or industry-standardised $SCSR$. Panel B shows the results when OLS regressions are used with industry fixed effects instead of firm fixed effects panel regressions. Panel A reports within R-squared, whereas Panel B shows the adjusted R-squared. $Post$ indicates the years after the MSCI indicator assessment change (from 2010 onwards) for baseline and propensity score (PS) matched estimations. $Treat$ is a dummy representing firms that experienced a change in their ESG scores from 2009 to 2010 (firms with an unchanged score belong to the control group). The same firm controls are used in the panel and OLS estimations. However, the Delaware incorporation dummy becomes redundant with firm fixed effects, similar to the $Treat$ dummy. Standard errors are shown in parentheses. Baseline DDD estimations reflect all firms in the control and treatment groups. The PS matched DDD estimation randomly identifies a comparable control firm observation matched on the log of assets, return on assets, and leverage, for every treatment observation. The first placebo test assumes placebo treatment in 2007, and the second test applies a placebo $Post$ in 2013. Levels of significance at the 10%, 5%, and 1% levels are indicated by *,**, and ***, respectively.

Panel A: Using Panel Regressions

	Baseline DDD		PS Matched DDD		Placebo Treatment 2007		Placebo Treatment 2013	
	ESG=CSR	ESG=SCSR	ESG=CSR	ESG=SCSR	ESG=CSR	ESG=SCSR	ESG=CSR	ESG=SCSR
ESG	0.0422*	0.3946**	0.0353	0.3170**	0.0699**	0.4426**	0.0224	0.2638**
	(0.024)	(0.159)	(0.023)	(0.148)	(0.029)	(0.185)	(0.019)	(0.126)
$Post$	0.4297***	0.6316***	0.3927**	0.5334***	0.3822***	0.6087***	0.4430***	0.5858***
	(0.111)	(0.140)	(0.153)	(0.174)	(0.114)	(0.136)	(0.120)	(0.147)
$ESG * Post$	-0.0552**	-0.4390**	-0.0467**	-0.3834*	-0.0779**	-0.4859**	-0.0401	-0.4063*
	(0.025)	(0.210)	(0.023)	(0.196)	(0.031)	(0.212)	(0.030)	(0.229)
$ESG * Treat$	-0.0400	-0.4445***	-0.0531**	-0.5326***	-0.0572*	-0.4735**	-0.0248	-0.2826**
	(0.025)	(0.172)	(0.025)	(0.176)	(0.031)	(0.201)	(0.019)	(0.133)
$Post * Treat$	-0.0075	-0.2455**	-0.0061	-0.3255***	0.0465	-0.2056*	-0.0154	-0.1684
	(0.064)	(0.112)	(0.067)	(0.120)	(0.073)	(0.110)	(0.078)	(0.120)
$ESG * Post * Treat$	**0.0435*** **	**0.4666** **	**0.0627*** **	**0.6790*** **	**-0.0111**	**0.1190**	**-0.0137**	**-0.1107**
	(0.016)	**(0.228)**	**(0.021)**	**(0.235)**	**(0.011)**	**(0.104)**	**(0.016)**	**(0.145)**
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	28160	28097	9880	9862	28160	28097	28160	28097
R-squared	0.166	0.165	0.193	0.194	0.166	0.165	0.165	0.165

Panel B: Using OLS Regressions

	Baseline DDD		PS Matched DDD		Placebo Treatment 2007		Placebo Treatment 2013	
	ESG=CSR	ESG=SCSR	ESG=CSR	ESG=SCSR	ESG=CSR	ESG=SCSR	ESG=CSR	ESG=SCSR
ESG	0.1064***	0.6509***	0.0966***	0.7021***	0.1330***	0.8408***	0.0902***	0.5358***
	(0.016)	(0.110)	(0.017)	(0.114)	(0.022)	(0.144)	(0.013)	(0.093)
$Post$	-0.2465***	0.0744	-0.3483***	0.0087	-0.2508***	0.1561	-0.2805***	0.0422
	(0.089)	(0.110)	(0.119)	(0.136)	(0.090)	(0.114)	(0.095)	(0.119)
$Treat$	-0.0685**	0.2080***	-0.1097***	0.1932***	-0.0649	0.2900***	-0.0797***	0.1037**
	(0.032)	(0.057)	(0.038)	(0.070)	(0.041)	(0.073)	(0.026)	(0.044)
$ESG * Post$	-0.0437**	-0.3602*	-0.0312	-0.4270**	-0.0673***	-0.6099***	-0.0208	-0.3542
	(0.021)	(0.187)	(0.022)	(0.168)	(0.025)	(0.182)	(0.027)	(0.224)
$ESG * Treat$	-0.0793***	-0.4890***	-0.0781***	-0.5598***	-0.0971***	-0.6776***	-0.0674***	-0.3375***
	(0.017)	(0.116)	(0.019)	(0.134)	(0.022)	(0.152)	(0.013)	(0.098)
$Post * Treat$	-0.0368	-0.3397***	-0.0388	-0.4111***	-0.0212	-0.3938***	-0.0402	-0.3143***
	(0.045)	(0.083)	(0.054)	(0.098)	(0.048)	(0.089)	(0.060)	(0.099)
$ESG * Post * Treat$	0.0446**	0.5691***	0.0535**	0.8000***	0.0031	0.4626	-0.0120	-0.0432
	(0.022)	(0.195)	(0.025)	(0.209)	(0.014)	(0.390)	(0.021)	(0.172)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	27941	27878	9796	9778	27941	27878	27941	27878
R-squared	0.276	0.274	0.278	0.276	0.310	0.308	0.246	0.244

Table 3

Do exogenous shocks to ESG strengths and concerns cause changes in Tobin's Q?
This table replicates the results of multiple triple difference (DDD) estimations from Table 2 for the impact of changes in ESG strengths and concerns on Tobin's Q instead of the aggregate ESG ratings. All regressions in Panel A are estimated using Model 4. Panel B shows the results when OLS regressions are used with industry fixed effects instead of firm fixed effects panel regressions. We show the results when the model uses both raw CSR and industry-standardised $SCSR$. $Post$ represents the years after the MSCI indicator assessment change (from 2010 onwards) for baseline and propensity score (PS) matched estimations. $Treat$ is a dummy representing firms that experienced a change in their ESG scores from 2009 to 2010 (with unchanged scores belonging to firms in the control group). Standard errors are shown in parenthesis. Baseline DDD estimations reflect the control and treatment firms. The PS matched DDD estimation randomly identifies a comparable control firm observation matched on the log of assets, return on assets, and leverage for every treatment observation. Similar to Table 2, the first placebo test assumes placebo treatment in 2007 and the second test applies placebo $Post$ in 2013. Levels of significance at the 10%, 5%, and 1% levels are indicated by *,**, and ***, respectively.

Panel A: Using Panel Regressions

	Baseline DDD		PS Matched DDD		Placebo Treatment 2007		Placebo Treatment 2013	
	ESG=CSR	ESG=SCSR	ESG=CSR	ESG=SCSR	ESG=CSR	ESG=SCSR	ESG=CSR	ESG=SCSR
$ESGs$	0.0861**	0.5212**	0.0743***	0.4236***	0.0282**	0.2001***	-0.0248**	-0.0529
	(0.036)	(0.214)	(0.019)	(0.123)	(0.011)	(0.072)	(0.012)	(0.098)
$ESGc$	-0.0378	-0.2912	-0.0209	-0.2355**	-0.0163	-0.0601	0.0115	0.1118
	(0.030)	(0.183)	(0.020)	(0.119)	(0.012)	(0.065)	(0.012)	(0.085)
$Post$	0.5805***	0.5234***	0.4585***	0.3902**	0.4519***	0.4146***	0.6861***	0.6617***
	(0.128)	(0.121)	(0.165)	(0.166)	(0.081)	(0.083)	(0.099)	(0.101)
$Post * Treat$	-0.1141	-0.0873	-0.1601**	-0.0683	-0.0182	-0.0474	0.0060	-0.0223
	(0.091)	(0.080)	(0.066)	(0.063)	(0.040)	(0.040)	(0.044)	(0.044)
$ESGs * Post$	-0.1006***	-0.6020**	-0.0859***	-0.4429***	-0.0357***	-0.1996***	0.0049	-0.0107
	(0.035)	(0.261)	(0.020)	(0.150)	(0.011)	(0.077)	(0.016)	(0.133)
$ESGs * Treat$	-0.0923**	-0.5594**	-0.0822***	-0.4943***	-0.0225	-0.2754***	0.0163	0.0845
	(0.037)	(0.225)	(0.026)	(0.176)	(0.015)	(0.097)	(0.013)	(0.111)
$ESGs * Post * Treat$	**0.0916****	**0.6287****	**0.1044*****	**0.6893*****	**0.0124**	**0.2819**	**-0.0175**	**-0.0442**
	(0.037)	**(0.277)**	**(0.026)**	**(0.207)**	**(0.014)**	**(0.192)**	**(0.017)**	**(0.147)**
$ESGc * Post$	0.0253	0.2691	0.0207	0.2285*	0.0210*	0.0539	-0.0282	-0.1508
	(0.029)	(0.181)	(0.026)	(0.138)	(0.012)	(0.073)	(0.028)	(0.127)
$ESGc * Treat$	0.0330	0.3066	0.0337	0.4710***	0.0029	0.1283	-0.0143	-0.1372
	(0.031)	(0.193)	(0.025)	(0.163)	(0.015)	(0.089)	(0.013)	(0.096)
$ESGc * Post * Treat$	**-0.0141**	**-0.2713**	**0.0002**	**-0.4190**	**-0.0044**	**-0.1172**	**0.0289**	**0.1913**
	(0.031)	**(0.191)**	**(0.033)**	**(0.294)**	**(0.015)**	**(0.100)**	**(0.031)**	**(0.141)**
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	24943	24809	8811	8765	23096	22979	23213	23091
R-squared	0.174	0.173	0.196	0.195	0.197	0.195	0.122	0.121

Panel B: Using OLS Regressions

	Baseline DDD		PS Matched DDD		Placebo Treatment 2007		Placebo Treatment 2013	
	ESG=CSR	ESG=SCSR	ESG=CSR	ESG=SCSR	ESG=CSR	ESG=SCSR	ESG=CSR	ESG=SCSR
$ESGs$	0.1622***	0.8076***	0.1544***	0.7568***	0.0786***	0.4805***	0.0523***	0.3613***
	(0.025)	(0.132)	(0.026)	(0.138)	(0.014)	(0.080)	(0.010)	(0.084)
$ESGc$	-0.0640***	-0.3620***	-0.0569***	-0.3649***	-0.0139	-0.0732	0.0124	0.0516
	(0.018)	(0.112)	(0.018)	(0.116)	(0.011)	(0.069)	(0.013)	(0.097)
$Post$	-0.1273	-0.0941	-0.2589**	-0.2482**	-0.1417	-0.1283	-0.4005***	-0.2990***
	(0.098)	(0.097)	(0.123)	(0.124)	(0.089)	(0.091)	(0.106)	(0.107)
$Treat$	-0.0475	-0.0733*	-0.0872	-0.1377***	0.1628***	0.1632***	-0.0550	-0.0592
	(0.044)	(0.042)	(0.054)	(0.052)	(0.043)	(0.044)	(0.044)	(0.044)
$Post * Treat$	-0.0993	-0.0995	-0.1458*	-0.0922	-0.0580	-0.0760	0.0455	0.0437
	(0.066)	(0.062)	(0.078)	(0.075)	(0.050)	(0.051)	(0.061)	(0.062)
$ESGs * Post$	-0.0836***	-0.2959	-0.0739**	-0.2103	-0.0318**	-0.0324	0.0240	0.1728
	(0.030)	(0.184)	(0.030)	(0.184)	(0.014)	(0.091)	(0.021)	(0.163)
$ESGs * Treat$	-0.1156***	-0.5279***	-0.0987***	-0.4678***	-0.0204	-0.3386***	0.0079	0.1040
	(0.025)	(0.135)	(0.029)	(0.160)	(0.017)	(0.098)	(0.013)	(0.108)
$ESGs * Post * Treat$	**0.0782****	**0.5164*****	**0.0884****	**0.6451*****	**0.0149**	**0.3525**	**-0.0035**	**0.0626**
	(0.030)	**(0.191)**	**(0.034)**	**(0.223)**	**(0.018)**	**(0.274)**	**(0.023)**	**(0.177)**
$ESGc * Post$	0.0457*	0.3173*	0.0167	0.2453	0.0329***	0.1569**	0.0306	0.1672
	(0.028)	(0.166)	(0.029)	(0.163)	(0.012)	(0.080)	(0.031)	(0.163)
$ESGc * Treat$	0.0768***	0.5027***	0.0694***	0.5921***	0.0177	0.2565***	0.0081	0.0773
	(0.018)	(0.117)	(0.021)	(0.139)	(0.013)	(0.091)	(0.012)	(0.096)
$ESGc * Post * Treat$	**-0.0276**	**-0.3454**	**-0.0026**	**-0.4283**	**-0.0257***	**-0.2770****	**-0.0162**	**-0.1964**
	(0.028)	**(0.273)**	**(0.033)**	**(0.299)**	**(0.016)**	**(0.109)**	**(0.035)**	**(0.176)**
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	24760	24627	8745	8699	22918	22802	23032	22911
R-squared	0.302	0.299	0.291	0.287	0.335	0.332	0.257	0.254

respect to the size and characteristics. Therefore, we applied one-to-one nearest neighbor propensity score matching on the size, profitability, and leverage dimensions using a 0.001 calliper, thus randomly identifying a comparable treatment firm observation for every control firm.[4] The baseline results in Panels A and B of Table 3 remain robust for this PS matched sample with the DDD term confirming a causal link between changes in CSR ratings and Tobin's Q. The DDD term for both CSR and SCSR is statistically significant ($p < 0.01$, using the firm fixed effects model, and $p < 0.05$, using the industry fixed effects model). The PS-matched results using CSR strengths and concerns in Table 4 also confirm the respective baseline results.

We conducted two placebo tests: one to assess whether pre-shock managerial anticipation occurs within the treatment firms ($Post = 1$ for 2007 onwards), and another to check if there is a generic trend in the second-half of the MSCI ESG data sample period ($Post = 1$ for 2013 onwards) as managers grow wise with time to pay attention to the most relevant indicators. As expected, both placebo estimations have a statistically insignificant DDD term in Tables 2 and 3, indicating that the treatment was relatively exogenous.

4.2. Additional Controls and Alternative Identification of Treatment Firms

Since some aspects of corporate governance, such as managerial entrenchment, are not included within the MSCI ESG indicators, we measured them separately. Following Bebchuk et al. (2009), we included managerial entrenchment as an additional control variable. To control for investor monitoring (Buchanan et al., 2018; Konijn et al., 2011), we include institutional ownership and blockholder presence as additional control variables. Although the inclusion of these variables considerably reduced our sample size, none of the main results were affected, and they remained persistent in magnitude and statistical significance. We also employed two alternative identification strategies. First,

[4]These three characteristics were proxied using the log of total assets, return on assets (ROA) and long-term debt to total asset ratio, respectively. We find that the two groups have statistically different profitability and leverage levels.

instead of identifying treatment and control firms based on changes in ESG ratings between 2009 and 2010, we employ a more restrictive identification involving firms whose ESG ratings remain stable for two consecutive years prior to the introduction of new MSCI methodology (i.e., 2008 and 2009), and then suddenly change in 2010 (treatment group), or remain unchanged (control group). Second, we employ Bloomberg's ESG disclosures scores to select a subset of firms with stable CSR disclosures in 2009 and 2010 (i.e., the firms whose ESG disclosure scores are constant in these years) and classified the alternative treatment and control group firms from within this set of firms. Our main inferences remained robust. We present these results in Appendix Table A.1.

5. Results from the Sub-Sample Tests

For the two sub-samples based on financial constraint variables, the results are summarized in Table 4, Panel A. With the capital availability proxied using cost of debt (COD) and Hadlock and Pierce's (2010) SA Index, our results show that the value relevance of ESG ratings is largely concentrated among firms with low capital constraints. The triple difference term is statistically significant ($p < 0.01$) only for this group of firms and not for firms with high capital constraints. These findings indicate that firms' CSR investments translate into superior firm value when they are not reeling under internal and external financial constraints. In other words, if firms are severely constrained, they will have no choice but to employ all the available capital to ensure smooth business operations rather than investing in CSR activities.

Panel B of Table 4 reports the results for the two variables representing the governance mechanisms that limit managerial freedom. We find that when institutional ownership is low or institutional investors' monitoring activities are minimal, the potential benefits from CSR ratings can be maximized. We find no evidence to suggest a role for managerial entrenchment in shaping the value-relevance of CSR. Over the years, with the growth in awareness of governance aspects, the distribution of entrenchment provisions within firms has been shrinking (Dumitrescu and Zakriya, 2022). This may be the

Table 4

Explaining the relationship between ESG ratings and Tobin's Q

This table reports the results of several triple difference (DDD) estimations of the impact of changes in ESG measures on Tobin's Q using sub-samples involving capital constraints (Panel A) and governance characteristics (Panel B). The main independent variable employed was either raw CSR or industry-standardized $SCSR$. We report only the estimations using the baseline model shown in Table 2. $Post$ indicates the years after the MSCI indicator assessment change (i.e., 2010 onwards). $Treat$ is a dummy representing firms that experienced a change in their ESG scores from 2009 to 2010 (with unchanged scores belonging to control firms). In Panel A, we report the results for two proxies of capital constraints: cost of debt and the SA Index. Panel B shows the results of monitoring by institutional investors and using the E-Index. For each of these sub-sampling variables, our sample firms are divided into two groups using the respective median values of the sub-sampling variables in each year. Levels of significance at the 10%, 5%, and 1% levels are indicated by *,**, and ***, respectively.

Panel A: Capital Constraints

	Cost of Debt				SA Index			
	Low Constraint		High Constraint		Low Constraint		High Constraint	
	ESG=CSR	ESG=SCSR	ESG=CSR	ESG=SCSR	ESG=CSR	ESG=SCSR	ESG=CSR	ESG=SCSR
ESG	0.1406***	0.6419***	0.0244	0.3557***	0.1541***	0.1845	-0.0053	0.5894***
	(0.027)	(0.213)	(0.018)	(0.138)	(0.033)	(0.816)	(0.013)	(0.089)
$Post$	0.5259**	0.9749***	0.4566**	0.5634***	-0.0166	-0.4112***	0.5082***	-0.1946***
	(0.263)	(0.285)	(0.187)	(0.196)	(0.795)	(0.152)	(0.074)	(0.062)
$ESG * Post$	-0.1440***	-0.8075***	-0.0187	-0.2232	-0.1250***	0.6981***	-0.0126	0.2245**
	(0.030)	(0.264)	(0.020)	(0.174)	(0.036)	(0.269)	(0.015)	(0.097)
$ESG * Treat$	-0.1443***	-0.8281***	-0.0259	-0.4037***	-0.1318***	-0.8627***	0.0027	-0.2436*
	(0.028)	(0.226)	(0.019)	(0.148)	(0.036)	(0.331)	(0.014)	(0.131)
$Post * Treat$	0.0063	-0.5013***	-0.0422	-0.2092**	0.0025	-0.5627*	-0.0547*	-0.3463***
	(0.060)	(0.127)	(0.041)	(0.082)	(0.073)	(0.293)	(0.032)	(0.104)
$ESG * Post * Treat$	**0.1308*** (0.031)**	**0.8677*** (0.280)**	**0.0149 (0.021)**	**0.2982 (0.188)**	**0.1148*** (0.039)**	**0.7931** (0.366)**	**-0.0061 (0.016)**	**0.2599* (0.140)**
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8011	8002	13012	12990	8156	8148	14935	14897
R-squared	0.188	0.184	0.201	0.201	0.171	0.171	0.207	0.205

Panel B: Governance Characteristics

	Monitoring				E-Index			
	Low		High		Low		High	
	ESG=CSR	ESG=SCSR	ESG=CSR	ESG=SCSR	ESG=CSR	ESG=SCSR	ESG=CSR	ESG=SCSR
ESG	0.0684***	0.5573***	0.0161	-0.0641	-0.0061	0.0570	0.0288	0.4033**
	(0.013)	(0.102)	(0.019)	(0.148)	(0.021)	(0.157)	(0.020)	(0.166)
$Post$	0.0928	0.4760***	0.6844***	0.5896***	0.5559***	0.5126***	0.4419***	0.6146***
	(0.088)	(0.103)	(0.117)	(0.138)	(0.129)	(0.150)	(0.134)	(0.163)
$ESG * Post$	-0.0643***	-0.6434***	-0.0094	0.2600	-0.0165	-0.0486	-0.0527**	-0.3428
	(0.014)	(0.132)	(0.023)	(0.191)	(0.022)	(0.190)	(0.025)	(0.232)
$ESG * Treat$	-0.0771***	-0.6446***	-0.0039	0.0868	0.0059	-0.1774	-0.0260	-0.4065**
	(0.013)	(0.110)	(0.020)	(0.158)	(0.021)	(0.169)	(0.021)	(0.178)
$Post * Treat$	0.1396***	-0.2641***	0.1185***	0.1959**	-0.0230	-0.0602	0.0091	-0.1594
	(0.034)	(0.067)	(0.046)	(0.090)	(0.050)	(0.095)	(0.056)	(0.115)
$ESG * Post * Treat$	**0.0715*** (0.015)**	**0.7274*** (0.144)**	**-0.0062 (0.023)**	**-0.2513 (0.204)**	**-0.0035 (0.023)**	**0.0397 (0.204)**	**0.0406 (0.027)**	**0.3070 (0.253)**
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10815	10783	12905	12874	10170	10139	6056	6049
R-squared	0.0883	0.0892	0.189	0.188	0.235	0.232	0.210	0.210

reason why its impact on valuation may have attenuated over time.

Taken together, these results show that easy access to capital and managerial freedom are important for shaping good CSR investments; and in this regard, ESG rating providers play an important role. Thus, while higher capital access and managerial freedom allow firms' managers to react quickly to any good CSR-related investment opportunities, their eventual benefits for firms in the long run can be affected by how it is reported by ESG raters.

6. Conclusions

This study highlights the role of ESG rating providers in driving valuation benefits from CSR ratings beyond those that reflect firms' CSR disclosures and performance. To do so, we employ a novel exogenous shock to CSR ratings that affects firms' CSR ratings irrespective of their actual CSR engagement. In other words, in our quasi-natural experimental setting, we capture the impact of a sudden CSR rating shock that is completely independent of firms' CSR orientation or stakeholder focus. Our research design ensures clean identification of the impact of CSR rating providers' actions on firm valuation. Exogenous variations in CSR ratings to study valuation outcomes are rare in the literature. Moreover, they do not always allow for segregating ESG rating providers' actions from the actual CSR engagement of firms. In our quasi-natural experiment, the exogenous shock to the ESG rating unexpectedly distorted the way a firm was perceived to handle its CSR activities. This means that we can capture how firm valuation is affected even by a trivial and superficial adjustment in their CSR ratings. In doing so, we make several important contributions to the literature that have potential implications for firms, their managers, investors, and regulators.

We find that firms that get their CSR ratings artificially boosted by a change in the MSCI ESG reporting methodology tend to have significantly higher firm values. These results are robust to alternative measures of CSR ratings and after controlling for firm-specific time-variant and -invariant heterogeneities. By assessing the internal validity of

our findings, we find strong support for a causal relationship between CSR ratings and firm value driven by ESG rating providers' actions (i.e., in our case, a change in methodology). By assessing the impact of ESG strengths and concerns on firm value separately, we find that valuation benefits were mainly driven by the MSCI strength indicators. This could be expected within our experimental setting due to the fact that the treatment (or the methodology shock) was largely concentrated on the strength dimension. Together, these results suggest that ESG rating providers could play an important role in helping firms maximize the valuation benefits that can be attained from their CSR investments and engagements. Simply put, ESG rating providers do not merely play the role of representative intermediation to collect and communicate firms' CSR disclosures to outsiders.

Furthermore, we found that firms with low financial constraints and institutional ownership seemed to benefit the most from a sudden change in their ESG ratings. Considering that this change was not reflective of any change in the firms' actual ESG engagement, our findings on the heterogeneous effects of capital constraint and institutional monitoring indicate that the valuation effects of ESG rating providers' interventions are not exhaustive. Limited capital availability and higher institutional monitoring seem to attenuate the influence of rating providers on the firms.

Appendix A. Supplementary Results

Table A.1

Robustness checks: Additional controls and alternative identification strategies
This table reports the robustness checks for the results shown in Table 2. We replicate the regressions in Table 2 Panel A with either additional control variables included (Panel A) or alternative identification strategies employed (Panels B and C). The independent variable is either raw CSR or industry-standardised $SCSR$. Along with the main control variables introduced in Table 2, $Post$ indicates the years after the MSCI indicator assessment change (from 2010 onwards) for baseline and propensity score (PS) matched estimations. $Treat$ is a dummy representing firms that experienced a change in their ESG scores from 2009 to 2010 (firms with an unchanged score belong to the control group). Panel A controls for corporate governance characteristics: managerial entrenchment (E-Index), institutional ownership, and number of blockholders. Panel B shows the results with first alternative identification where $Treat$ represents firms that experienced a change in their ESG scores from 2009 to 2010 conditional on having an unchanged ESG scores in 2008 and 2009. Correspondingly, the firms with an unchanged ESG score between 2008 and 2010 belong to the control group. Panel C considers the second alternative identification that employs $Treat$ variable to indicate firms that underwent a change in their ESG scores from 2009 to 2010 conditional on having a uniform Bloomberg's ESG disclosure scores in the years 2009 and 2010. Standard errors are shown in parentheses. Baseline DDD estimations employs all firms in the identified control and treatment groups. The PS matched DDD estimation randomly identifies a comparable control firm observation matched on the log of assets, return on assets, and leverage, for every treatment observation. The first placebo test assumes placebo treatment in 2007, and the second test applies a placebo $Post$ in 2013. For brevity, we only show the coefficients for the DDD term. Levels of significance at the 10%, 5%, and 1% levels are indicated by *,**, and ***, respectively.

Panel A: With Additional Controls

	Baseline DDD		PS Matched DDD		Placebo Treatment 2007		Placebo Treatment 2013	
	ESG=CSR	ESG=SCSR	ESG=CSR	ESG=SCSR	ESG=CSR	ESG=SCSR	ESG=CSR	ESG=SCSR
$ESG * Post * Treat$	**0.0534*** (0.016)**	**0.4972*** (0.157)**	**0.0681*** (0.025)**	**0.4972*** (0.157)**	**0.0184 (0.013)**	**0.1127 (0.123)**	**-0.0274 (0.018)**	**-0.0625 (0.156)**
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	11798	11792	4151	4151	11299	11293	11130	11124
R-squared	0.226	0.226	0.238	0.238	0.219	0.217	0.213	0.212

Panel B: Alternative Identification Using Stable ESG Ratings between 2008 and 2010

	Baseline DDD		PS Matched DDD		Placebo Treatment 2007		Placebo Treatment 2013	
	ESG=CSR	ESG=SCSR	ESG=CSR	ESG=SCSR	ESG=CSR	ESG=SCSR	ESG=CSR	ESG=SCSR
$ESG * Post * Treat$	**0.0401* (0.022)**	**0.5313*** (0.192)**	**0.0580*** (0.029)**	**0.7882*** (0.265)**	**-0.0297 (0.044)**	**0.1540 (0.327)**	**-0.0274 (0.018)**	**-0.0625 (0.156)**
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14910	14905	5606	5605	12192	12189	11918	11915
R-squared	0.176	0.176	0.196	0.196	0.159	0.154	0.213	0.212

Panel C: Alternative Identification Using Stable ESG Disclosure Scores in 2009 and 2010

	Baseline DDD		PS Matched DDD		Placebo Treatment 2007		Placebo Treatment 2013	
	ESG=CSR	ESG=SCSR	ESG=CSR	ESG=SCSR	ESG=CSR	ESG=SCSR	ESG=CSR	ESG=SCSR
$ESG * Post * Treat$	**0.0402* (0.024)**	**0.4838* (0.289)**	**0.0309* (0.019)**	**0.5165* (0.335)**	**0.0335 (0.044)**	**0.1818 (0.350)**	**-0.0111 (0.044)**	**0.2075 (0.350)**
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5683	5681	2292	2291	5683	5681	5683	5681
R-squared	0.219	0.219	0.283	0.285	0.221	0.218	0.219	0.218

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