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The role of corporate social responsibility (CSR) information in supply-chain contracting: Evidence from the expansion of CSR rating coverage

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ABSTRACT

We examine the effect of CSR information on stakeholder decision-making, specifically on supply-chain contracting. To obtain plausibly exogenous variation in CSR information, we exploit the 2017 expansion of CSR rating coverage from Russell 1000 to Russell 2000 firms (hereafter, "treated firms") by Thomson Reuters Asset4. Using a difference-in-differences design with the previously covered Russell 1000 supplier firms as the control group, we find a negative effect of the CSR information shock for treated suppliers with comparatively low CSR ratings. On average, these suppliers experience reductions in their number of contracts and corporate customers. In cross-sectional analyses, we document variation in our treatment effects consistent with two underlying mechanisms: (i) benchmarking of suppliers' CSR by corporate customers and (ii) CSR-related public pressure on customer-supplier contracting. Collectively, our findings provide novel evidence on the causal effect of CSR information on stakeholder decision-making.

1. Introduction

We examine the effect of CSR information on (non-investor) stakeholder decision-making. Policymakers and regulators, such as the European Union (EU), impose CSR transparency requirements, especially on large listed firms, with the stated objective of facilitating stakeholder monitoring of firms' CSR (Fiechter et al., 2022). There is, however, scarce academic research examining how stakeholders react to firms' CSR information. Specifically, while there is evidence that investors value CSR (e.g., Hartzmark and Sussman, 2019), it is not clear whether and how non-investor stakeholders use CSR information (Christensen et al., 2018). Related, studies investigating firms' business decisions in response to CSR disclosure mandates

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typically assume (but do not demonstrate) that these real effects—e.g., investments into labor safety (Christensen et al., 2017) or expenditures to reduce pollution (Chen et al., 2018)—are prompted by anticipated or actual stakeholder reactions. In this study, we aim to shed light on a key element of this literature's proposed underlying causal chain, that is, stakeholder responses to CSR information. Specifically, we investigate the impact of a CSR information shock, effected by a third-party information intermediary, on customer-supplier contracting decisions.

Several features make the supply-chain setting apt for investigating the effect of CSR information on stakeholder decision-making. First and foremost, customer-supplier relationships are economically important (e.g., Acemoglu et al., 2012; Acemoglu et al., 2016; Carvalho et al., 2021). Suppliers provide, on average, 45 percent of the value delivered by customer firms to the market (Carter et al., 2021). Second, empirical evidence suggests that CSR matters for customer-supplier relationships (Schiller, 2018; Dai et al., 2021; She, 2021). For example, Dai et al. (2021) show that suppliers' CSR policies can be affected by their customers' CSR practices. Third, while contractual relations (and thus decision-making) between firms and their stakeholders are typically unobservable, the supply-chain setting provides granular data at the contract level, enabling us to directly observe contractual relations between suppliers and their corporate customers. Finally, a typical Russell 1000 (2000) supplier in our sample has contracts with, on average, 15 (10) corporate customers from eight (nine) different industries each year. This indicates that, given the variation in suppliers' disclosures and reporting formats, corporate customers face nontrivial disclosure processing costs, i.e., costs of identifying, procuring, and analyzing the CSR information of their current and potential suppliers (Kim and Davis, 2016; Blankespoor et al., 2020).

Empirically isolating CSR information effects is challenging. For example, voluntary CSR disclosure settings are prone to endogeneity issues such as difficulties in separating the effects of CSR disclosures from the effects of underlying CSR activities (Christensen et al., 2021). Mandatory (regulatory) settings, in comparison, face identification challenges, such as potential anticipation, early adoption, or avoidance by firms as well as the lack of control firms within the same regulatory setting (Leuz, 2018). In our paper, we circumvent these issues by exploiting a CSR information shock, i.e., a plausibly exogenous increase in CSR information for a subset of firms. In 2017, Thomson Reuters (now Refinitiv) Asset4, a leading provider of CSR ratings, increased its index-based coverage of U.S. firms on a large scale, providing—in addition to the previously covered Russell 1000 firms—for the first time its CSR ratings for firms included in the Russell 2000 index. This shock was quite substantial for Russell 2000 firms, on average, as at the time they were not subject to (concurrent changes in) mandatory CSR reporting requirements, provided relatively few voluntary CSR disclosures, and did not experience a concurrent change in coverage by alternative ESG providers (see Section 3.1).

We build our empirical predictions on two premises: (i) suppliers' CSR is economically important for corporate customers and (ii) the CSR information shock reduces disclosure processing costs for corporate customers and other stakeholders. With respect to our first premise, recent empirical evidence (e.g., Dai et al., 2021; She, 2021) demonstrates that corporate customers care not only about their own CSR but also about their suppliers' CSR. For example, the quality of suppliers' CSR signals legal and reputational risk exposure as well as potential supply chain disruptions (e.g., relating to suppliers' long-term financial health and product quality). In addition, corporate customers may have incentives (or face pressure) to keep their own supply chain "green," thereby avoiding reputational damage, social activism (e.g., from customers, employees, investors, etc.), or policymakers' pressure.

As for our second premise, we posit that the CSR information shock represents incremental, salient CSR information to stakeholders, including corporate customers. Commercial rating providers such as Thomson Reuters are information intermediaries that collect information on firms' CSR from various sources, structure this information, and condense it into ratings based on a proprietary technology. These intermediaries therefore help reduce disclosure processing costs for stakeholders (Blankespoor et al., 2020). For example, as corporate customers face costs of identifying, procuring, and digesting information about their suppliers' CSR, they may not incorporate all available information into their decisions. Therefore, for at least some corporate customers, the provision of salient, easy-to-access CSR information (via the CSR information shock) likely reduces processing costs and hence alters their information sets.

Based on these premises, we propose two nonmutually exclusive mechanisms through which the CSR information shock potentially affects contracting between corporate customers and suppliers: benchmarking and public pressure. According to the benchmarking mechanism, customers will re-assess their contracting decisions in the light of incremental CSR information about their suppliers. While corporate customers typically possess information about their suppliers' CSR due to their close relationships (Costello 2013; Bushee et al., 2020; Crawford et al., 2020), the newly available ratings likely provide incremental information about suppliers' *relative* CSR performance, facilitating comparisons and benchmarking. A potential result is that corporate customers revise their portfolio of suppliers by, for example, deciding not to renew business relations with suppliers whose relative CSR is lower than previously assumed.

According to the public pressure mechanism, corporate customers anticipate or react to public pressure to maintain a green or socially responsible supply chain. Public pressure derives from stakeholders' attempts to impose their CSR preferences on corporate customers and comes in many shapes. For example, investors may pressure low CSR firms by selling their stock in these firms or sponsoring CSR-oriented proposals at shareholder meetings (Dimson et al., 2015). Examples of non-investor stakeholder pressure include CSR-oriented purchasing decisions by retail customers or NGO campaigns targeted at firms with poor CSR (Dyreng et al., 2016; Rauter, 2020). Again, the Asset4 coverage increase helps these other stakeholders acquire and interpret CSR information and thus enables them to single out and pressure suppliers with poor CSR and their corporate customers. If this (perceived) public pressure is economically relevant or harmful to corporate customers, we expect corporate customers to adjust their supplier portfolios.

We employ a difference-in-differences design to test the impact of the CSR information shock on customer-supplier contractual relations. The sample period spans the years from 2014 until 2018, with 2017, the year of the Asset4 coverage expansion, as the first post-treatment year. Our treatment sample comprises all supplier-year observations for suppliers included in the Russell 2000 index at the end of 2016. Because both our channels, benchmarking and public pressure, predict a negative treatment effect for low CSR firms, we split our treatment firms into low and high CSR firms based on Asset4 ratings within Russell 2000 in the post-treatment period. As our control group, we use a matched sample of suppliers included in the Russell 1000 index at the end of 2016, as these firms were subject to Asset4 coverage throughout the entire sample period. To reduce pre-treatment differences between treated and control firms, we match our sample firms based on entropy balancing weights (e.g., Hainmueller, 2012; McMullin and Schonberger, 2020). We impose a balanced sample structure on our sample firms, control for several firm characteristics (including the number of expired contracts), and include firm- and year-fixed effects to control for unobservable time-invariant firm characteristics and time-specific shocks. Using data from FactSet, we define the following two outcome variables: (i) the annual number of newly initiated customer-supplier contracts and (ii) the annual number of new corporate customers linked to these contracts.[1]

In our first set of tests, we find a negative average effect for our treatment firms (Russell 2000 suppliers) for both outcome variables, new contracts and new customers. Consistent with the benchmarking and public pressure explanations, this effect is concentrated in suppliers with relatively poor CSR performance. These findings are economically meaningful, with a relative reduction in new contracts of around 32% and a loss of customers of around 31% (both relative to the pre-treatment mean) for low CSR suppliers. These economic magnitudes likely represent upper bound estimates, notably because the effects are driven by contracts with relatively low economic importance and low relationship-specific investments (see Sections 4.2 and 5.1). In contrast to the findings for low CSR suppliers, we do not observe positive contracting effects for high CSR suppliers. This finding is not surprising, as our proposed mechanisms primarily apply to low CSR suppliers. This asymmetric response to CSR information in our supply-chain setting is also consistent with prior evidence on asymmetric investor reactions to CSR news (e.g., Flammer, 2013; Kruger, 2015).

To gauge the plausibility of the parallel-trends assumption, we estimate yearly treatment effects (with 2014 as the base year) separately for treated firms with high and low CSR performance. We find insignificant treatment effects in the pre-treatment period (2015−2016) for both low CSR suppliers and high CSR suppliers, mitigating concerns about potential pre-trends in contractual outcomes. We also find a significantly positive, sharp treatment effect for low CSR suppliers in the first post-treatment year (2017). Collectively, these results do not indicate that the parallel-trends assumption is violated. We also assess the validity of our control group and find that our results are robust to alternative matching techniques (i.e., propensity-score matching and synthetic control group matching) and unmatched sample specifications.

Next, we shed light on our two nonmutually exclusive explanations. If benchmarking affects contractual outcomes after the CSR information shock, we expect the treatment effect to be more pronounced in cases where (pre-shock) information asymmetry between the corporate customer and supplier is high. We construct an aggregate measure capturing contractual relations with high versus low information asymmetry (i.e., supplier-customer pairs not operating within the same four-digit industry, suppliers with short-term business relationships, and supplier-customer pairs with low contracting intensity) and re-define our contractual outcome measures. We find that the negative treatment effect is concentrated in low CSR suppliers that operate in high information asymmetry relationships. This finding is consistent with customers benchmarking their suppliers according to their relative CSR. In a second set of analyses, we differentiate suppliers according to the (pre-shock) Asset4 rating coverage in their industry, identifying suppliers with a relatively high (low) increase in coverage of their industry peers. As benchmarking by customers is about relative evaluation of suppliers' CSR, we expect the magnitude of the information shock and resulting benchmarking effects to be larger when previous coverage of suppliers' industry peers was relatively low. Our subsample findings are in line with this prediction.

With the public pressure explanation, we would expect our treatment effect to be more pronounced for customer-supplier pairs subject to high visibility. We aggregate contract characteristics related to customers' visibility (i.e., customer is listed and operates in a business-to-consumer industry) and re-define our outcome variables. Consistent with public pressure, we find that the negative treatment effect is more pronounced for low CSR suppliers that contract with customers subject to high visibility. We complement these findings with subsample analyses that differentiate suppliers (instead of customers), according to their visibility, which we measure based on suppliers' position within the supply chain and the media attention directed at the supplier. Consistent with public pressure, the negative treatment effect for low CSR suppliers is concentrated in suppliers facing high visibility.

Our findings are subject to at least two caveats. First, while we document negative effects on contractual relations for low CSR suppliers, we cannot directly observe which party initiates the contracting changes: corporate customers or suppliers. If corporate customers (instead of suppliers) change their contracting with low CSR suppliers in response to the CSR

[1] The choice of our treatment group (i.e., suppliers listed in the Russell 2000 index) and the corresponding dependent variables based on suppliers' portfolios of various customers (i.e., a supplier can have contracts with different customers) have important implications for our research design. In particular, we do not impose specific data availability restrictions on the corporate customers in the portfolios (besides identifying information in FactSet) to ensure that our dependent variables comprehensively capture the number of contracts with customers and the number of new customers. One limitation that follows from this approach is that we cannot (cross-sectionally) exploit firm characteristics of corporate customers beyond the key information provided by FactSet (e.g., name, identifier, industry, listing status). In addition, this is also one of the reasons why we cannot observe where (and how) customers redirect their contracting after the information shock.

information shock, we expect our treatment effect to vary with the economic importance or bargaining power of suppliers vis-à-vis corporate customers (Dai et al., 2021). We construct an aggregate measure capturing suppliers' economic importance (i.e., supply-chain relation is disclosed by customers, customers operate in industries that have higher competition vis-à-vis suppliers, and suppliers are important for customer based on FactSet ranking information) and re-define our outcome variables. Treatment effects are more pronounced for contractual relations in which the supplier has low economic importance. In addition, we do not find that low CSR suppliers experience increased financing constraints, a potential trigger for renegotiating contracts with corporate customers (Costello, 2020). Both findings are consistent with corporate customers, rather than suppliers, initiating contracting changes in response to the CSR information shock. Bolstering this interpretation, we find no evidence that our contracting results are driven by changes in customers' disclosure behavior (e.g., customers becoming opaque about their supply-chain relations with low CSR suppliers) instead of real contracting changes.

A second caveat is that the CSR information shock potentially also affects our control group, (i.e., Russell 1000 firms), because the Asset4 coverage expansion also facilitates comparison between the newly covered Russell 2000 suppliers with previously covered Russell 1000 suppliers. We address this concern by performing subsample tests comparing low and high CSR suppliers *within* Russell 2000, and we find evidence supporting our main inferences. In addition, we perform a synthetic control group analysis separately for Russell 2000 firms and Russell 1000 firms. This analysis suggests a decline in contracting for low CSR Russell 2000 suppliers, relative to high CSR Russell 2000 suppliers, consistent with our main inferences.

Finally, we investigate whether the reduction in contracting after the CSR information shock affects suppliers' financial and nonfinancial performance. First, we find that reduced contracting translates into negative firm performance effects, i.e., a reduction in sales growth (around 16 percentage points). Second, we examine one plausible response by low CSR suppliers to the CSR information shock and its contracting consequences: stepping up nonfinancial (CSR) performance (e.g., Christensen et al., 2017; Chen et al., 2018). Using the Violation Tracker database (e.g., Heese et al., 2022; Raghunandan, 2021), we find some, albeit weak, evidence of a decrease in violations of federal laws (e.g., workplace safety, wage-and-hour rules, or environmental and consumer protections) for low CSR suppliers. Additional content analysis reveals that low CSR suppliers gradually increase the number of new CSR initiatives over time.

Our study makes several contributions. Our paper is among the first to show the (causal) effect of CSR information on decision-making by non-investor stakeholders. Specifically, we show that a plausibly exogenous increase in information available about suppliers' CSR affects their contractual relations with corporate customers. Second, our findings add to the literature on real effects of CSR disclosures (Christensen et al., 2017; Chen et al., 2018; Rauter, 2020) by shedding light on a key element of this literature's proposed underlying causal chain: stakeholder responses to CSR information. Third, our study complements the findings of Dai et al. (2021) and She (2021). Dai et al. (2021) show the diffusion of socially responsible behavior from corporate customers to their suppliers (e.g., through positive assortative matching of CSR attributes). She (2021) finds that corporate customers increase their supply-chain due diligence in response to mandatory supply-chain disclosures. Our paper provides a novel angle by documenting a reduction in customer-supplier contracting upon revelation of suppliers' comparatively poor CSR quality. Fourth, we add to the growing research on the economic role of CSR rating vendors and their ratings. Our study differs from previous research (e.g., Chatterji et al., 2016; Christensen et al., 2022) by exploiting a coverage perspective (versus an isolated focus on the final rating) and showing that third-party CSR rating information facilitates comparability and visibility of CSR information.

2. Conceptual underpinning

We predict that the CSR information shock, effected by the first-time rating coverage of suppliers by a third-party information intermediary, affects supply-chain contracting decisions. Anecdotes suggest that corporate customers use CSR information in their management and evaluation of contractual relations with suppliers. In its 2018 CSR report, Daimler, a global car manufacturer, states: "To make sure that our direct suppliers comply with the sustainability standards, we regularly conduct risk analyses. We use regular database research and other measures to discover any violations of our sustainability and compliance rules by our current suppliers. We systematically follow up all reports of violations" (Daimler, 2018, p. 108). Our empirical prediction that the CSR information shock affects supply-chain contracting decisions rests on two premises: (i) suppliers' CSR is economically important for customers and (ii) the CSR information shock reduces disclosure processing costs for corporate customers and other stakeholders. Based on these premises, we propose two nonmutually exclusive mechanisms: benchmarking (section 2.1) and public pressure (section 2.2).

2.1. Benchmarking

Assessing and comparing suppliers' CSR performance likely is not a trivial task for corporate customers. Disclosure processing costs limit the extent to which corporate customers procure and process relevant CSR information from sources that vary widely in terms of structure and content.[2] The CSR information shock potentially reduces these processing costs, as the

[2] One reason for heterogenous CSR disclosures by firms is the lack of a common set of (global) reporting standards. For example, the number of ESG-related reporting frameworks increased from around 700 in 2009 to more than 1,700 in 2019 (*The Economist*, 2020). Hence the standardization of CSR disclosures across or within countries is still a long way off. This makes standalone evaluation of ESG information a futile exercise.

CSR ratings assist corporate customers in assessing individual CSR performance of each supplier. However, given the close and contractual relation between corporate customers and suppliers (Costello, 2013; Bushee et al., 2020; Crawford et al., 2020), corporate customers likely possess information about their suppliers' CSR. We thus argue that the CSR information shock primarily affects *relative* CSR information. In other words, the newly available CSR ratings facilitate the relative sorting, i.e., benchmarking of suppliers according to their CSR performance. For example, Tomar (2021) provides evidence suggesting that US manufacturing plants use their peers' mandatory greenhouse gas disclosures to benchmark (and eventually reduce) their own emissions.

Relative CSR performance information is particularly relevant in situations in which absolute indicators of performance are noisy. For example, network effects (Gao et al., 2019) suggest that the adoption of common standards increases comparability and lowers the cost of processing financial reports. The general evaluability theory (Hsee, 2000; Hsee and Zhang, 2010) argues that the usefulness of a (CSR) metric is potentially low without knowledge of the underlying value distribution of the metric (e.g., a noisy or inaccessible time series of the CSR metric) or lack of a neutral reference point (e.g., industry median). Many people, although they know that less carbon emissions are better, would not know whether a given emission rate is high or low, especially relative to the emission rate of other firms within an industry. As rating providers standardize and distribute CSR metrics mainly in an industry-specific uniform manner, the initiation of rating coverage provides relative CSR information and facilitates the comparison of noisy absolute measures; i.e., it enables benchmarking CSR performance across firms.[3] Corporate customers may then revise their portfolios of suppliers by, for example, deciding not to renew business relations with suppliers whose relative CSR is lower than previously assumed.

2.2. Public pressure

The CSR information shock potentially reduces disclosure processing costs not only for corporate customers but also for other stakeholders (e.g., retail customers, investors, or NGOs) and for intermediaries such as the financial press, by increasing awareness and salience of CSR performance (Blankespoor et al., 2020). Therefore, after the information shock, especially corporate customers with low CSR suppliers will likely face increased stakeholder actions directed at their suppliers and at the customers themselves. For example, Dyck et al. (2008) show that public pressure (via media coverage) increases with the magnitude of firms' corporate governance violations. The evidence of Dyreng et al. (2016) illustrates that a public shaming campaign by a U.K. NGO targets noncompliant firms with tax haven subsidiaries. Rauter (2020) finds that the effect of mandatory extraction payment disclosures on payments to host countries is stronger for firms facing a high risk of public shaming. To the extent that this (expected) public pressure is economically relevant or harmful to corporate customers, we expect them to adjust their supplier portfolios and related contracting by, for example, reducing contracting with low-quality CSR suppliers.

3. Empirical setup and data

3.1. Expansion of Asset4 coverage

Our identification strategy exploits a recent increase in Thomson Reuters (now Refinitiv) Asset4 coverage. In 2017, Asset4, a leading provider of CSR ratings, increased its index-based coverage of U.S. firms on a large scale, providing for the first time its CSR ratings for firms included in the Russell 2000 index. This is the largest coverage increase for a single market in the history of Asset4. Asset4 provides CSR information for over 9,000 listed firms globally with time series data going back to 2002 (Refinitiv, 2021). More than 150 research analysts collect CSR data comprising over 400 different ESG input factors to update, on a weekly basis, the information and ratings. The ESG information is collected from a variety of public sources (e.g., annual reports, regulatory or stock exchange filings, company and NGO websites, CSR reports, news sources) and then transformed into ratings based on Asset4's proprietary technology. In terms of importance and visibility, Asset4 is named as a top five rating provider in the categories "usefulness" and "quality" in a recent survey among NGOs, think tanks, and academics (SustainAbility 2019), and it is one of the three key rating providers analyzed in a recent OECD report (Boffo and Patalano, 2020). Asset4 ratings are used by major asset managers such as BlackRock in assessing ESG investment risk (Responsible Investor, 2011). This important role of Asset4 is also reflected in academic research that frequently employs Asset4 data (e.g., Lys et al., 2015; Ferrell et al., 2016; Liang and Renneboog, 2017; Dyck et al., 2019; Dai et al., 2021).[4]

[3] Comparability (and benchmarking) is also an important feature of the investment landscape. For example, the best-in-class approach refers to the investment philosophy whereby funds invest in firms that have done better on ESG principles than their competitors within the same industry. This idea applies also to our supply chain setting, where corporate customers have limited flexibility in switching to a supplier from a different industry, as the production process likely requires procurement of specific inputs.

[4] Recent research also examines the validity and convergence of ESG ratings, providing mixed evidence (e.g., Chatterji et al., 2016). For instance, Berg et al. (2022) and Diebecker et al. (2019) document rating disagreement among different data vendors. However, in this paper, we adopt a coverage perspective and do not require the ratings to perfectly reflect the underlying CSR activities of the firms. Instead, our predictions rely on the premise that market participants perceive the CSR ratings as useful benchmarks. Consistent with this premise, Serafeim and Yoon (2021) and Hartzmark and Sussman (2019) show that markets react to summary measures of CSR performance.

Asset4's coverage expansion represents a plausibly exogenous shock to firm-level CSR information. Our identifying assumption is that there are no other factors correlated with customer-supplier contracting outcomes *and* the Asset4 rating coverage initiation at the supplier level. Although Asset4 likely expected a general demand for the expanded coverage, it is unlikely that the preferences of individual Russell 2000 firms (or their stakeholders) triggered the timing of this large-scale coverage increase.[5]

Another advantage of our setting is that it provides estimation power along three dimensions. First, small and medium-cap firms, such as our treated Russell 2000 suppliers, are not subject to marketwide mandatory CSR reporting standards and, on average, provide few voluntary CSR disclosures at the time of the coverage increase: in our sample, only 7% (4%) of treated firms provided a CSR report (GRI-compliant CSR report). Second, small and medium-cap firms likely depend more on their relationship with specific business partners.[6] Third, the coverage expansion affects a large set of U.S. firms (i.e., all firms from the Russell 2000 index), providing a representative treatment sample.

3.2. Difference-in-differences analysis

In our empirical tests, we employ difference-in-differences methodology to investigate the effect of the CSR information shock on supply-chain contracting. Equation [1] states our baseline model.

$$Contracting = \beta_1 + \beta_2 POST \times TREAT \times HighCSR + \beta_3 POST \times TREAT \times LowCSR + \sum \beta_j Controls_j + \sum \beta_k Fixed\,Effects_k + \varepsilon \quad (1)$$

The idea behind this model is to compare changes in our dependent variable, *Contracting*, across treatment and control firms around the treatment event. The sample period spans the period 2014−2018, with 2017 and 2018 as post-treatment years. Our choice of a five-years sample period reflects the trade-off between sufficiently long pre- and post-windows (e.g., to assess the sharpness of our treatment effect and to allow for potential post-treatment dynamics) and the risk of importing confounding effects (e.g., via concurrent CSR events) through a longer sample period. As our treatment sample, we use all firm-year observations for suppliers included in the Russell 2000 index at the end of 2016.[7] Our control group includes all suppliers that were part of the Russell 1000 index at the end of 2016. Our indicator variable measuring firms' CSR, *HighCSR (LowCSR)*, takes the value of 1 if the supplier firm has an above (below) median CSR performance based on Asset4 rating information within Russell 2000 in the post-treatment year 2017 and 0 otherwise. Therefore the coefficient on *POST*×*TREAT*×*LowCSR* reflects the treatment effect for Russell 2000 suppliers with relatively low CSR at the time of the information shock.

We include firm- and year-fixed effects to control for unobservable time-invariant firm characteristics and time-specific shocks, respectively. In all regressions, we use standard errors that are robust and one-way clustered at the industry level.[8] To minimize potential pre-trends in our outcome variable, we use entropy balancing and estimate Eq. (1) based on entropy balancing weights (e.g., Heckman et al., 1998; see Online Appendix A and Section 3.4).[9,10]

3.3. Data and variable measurement

We employ data from various sources: (i) supply chain data at the corporate customer-supplier level from FactSet Revere, (ii) firm-level ESG data from Thomson Reuters Asset4, (iii) firm fundamentals from Thomson Reuters Datastream/Worldscope, (iv) financial analyst data from IBES, and (v) Russell index membership data from Capital IQ. Appendix A provides definitions of all variables used in our analyses.

[5] For example, we inspect other rating providers' data manuals (i.e., KLD and Bloomberg) and find no indication that our treated firms experience notable concurrent changes in rating coverage. This mitigates the concern that our findings are driven by a specific demand for CSR information (e.g., a demand by CSR-sensitive institutional investors). Our main results also remain robust (untabulated) when including a control variable capturing concurrent changes in coverage by KLD.

[6] For example, 65% of small IPO firms tend to disclose at least one major customer that accounts for a substantial portion of their sales (Johnson et al., 2010).

[7] In addition, we require that Asset4 summary ratings are available for the year 2017.

[8] Our inferences are robust to alternative clustering of standard errors, such as one-way clustered at the firm level (untabulated). We note the trade-off between selecting a few large groups for clustering (e.g., at the industry level) to accommodate more appropriately the various dependences in the data versus selecting a cluster level with a modest number of groups that more likely meet the homogeneity restriction, such as clustering by firm (Conley et al., 2018, p. 1142). In addition, our industry-level cluster choice results in a nested firm-fixed effect structure. The nonnested year-fixed effect structure is less of a concern, as the number of observations to estimate the year-fixed effects is sufficiently large and the time span relatively short (Conley et al., 2018, p. 1175).

[9] The entropy balancing is based on pre-treatment levels of our key main outcome variables (number of new contracts, number of new customers, and sales growth) as well as industry membership to mitigate concerns for nonparallel trends between our treatment and control group (e.g., Heckman et al., 1998; Ryan et al., 2015; Lindner and McConnell, 2019).

[10] Our treated and control firms differ, especially in size (even after employing different matching techniques). For example, our treatment group indicator *TREAT* (equal to 1 for Russell 2000 suppliers) is highly correlated with our firm size proxy *LN(TA)*, with a correlation coefficient of −0.73. Due to multicollinearity, we cannot include *POST*×*LN(TA)* as an additional control to capture differential pre-post size effects and trends in our difference-in-differences specification. We address potential concerns regarding firm size differences by estimating within treatment group effects in Section 4.4.3 and by examining pre-trends in our outcome variable (see also our discussion of the parallel trends assumption in Section 4.3).

Our main variable of interest, contractual relations between customers and suppliers, is based on data provided by FactSet Revere Supply Chain Relationships. FactSet Revere provides supply-chain information (e.g., identifies corporate customers' contractual relations with their suppliers) for over 20,000 firms worldwide, with information dating back to 2003. FactSet Revere collects its information from public sources (e.g., firms' regulatory filings, websites, press releases, investor presentations) and covers both minor and major private and publicly listed customers (Dai et al., 2021).[11] Using this data, we construct two main outcome variables at the supplier-year level to capture contracting between corporate customers and their suppliers: (i) number of new contracts and (ii) number of new customers.

As our identification strategy exploits the increase of Asset4 coverage in 2017, we use Asset4's environmental rating (*ENV*) and social rating (*SOC*) as well as the average of both ratings (*CSR*) to examine the cross-sectional variation in the treatment effect.[12] We employ several control variables in our model: firm size (*LN(SIZE)*) as log of total assets, leverage (*LEV*) as total debt to total assets, Tobin's Q (*TQ*) as market value scaled by total assets, operating profitability (*ROA*) as net income scaled by total assets, sales growth (*GROWTH*) as change in revenues, cash constraints (*CFO*) as cash from operations scaled by total assets, investment intensity (*PPE*) as property, plant, and equipment scaled by total assets, ownership structure (*LN(FF)*) as log of the percentage of shares in free float, analyst following (*LN(AF)*) as log of the number of financial analysts following a firm, and *CSR Reporting* indicating whether the firm publishes a CSR report. We also include variables for Russell 1000 and 2000 membership to control for changes in our outcome variable due to index switching. Finally, we control for the number of contracts that expire in a given year (*EXPCONTRACTS*), as this expiration might affect our outcome variables independent of any changes in supply-chain contracting due to the CSR information shock.[13]

3.4. Sample selection and summary statistics

The sample period covers a five-year period around the Asset4 coverage increase in 2017 (i.e., 2014−2018). After eliminating observations with missing data, we obtain a balanced panel sample of 3,510 supplier-year observations, of which 1,660 (1,850) are treated (control) supplier-year observations. Panel A of Table 1 summarizes the sample selection procedure, and Panel B documents sample composition across years. Panel C provides further details on the sample composition across industries, suggesting that treated and control firms have similar industry distributions. Panels D and E of Table 1 provide summary statistics and correlations for our main set of variables. In Panel D, we observe that control firms are on average larger, have higher CSR scores, and have larger customer portfolios with more contracts, compared to treated firms. As the same customer can have multiple contracts with the same supplier, *Number of customers* is on average lower than the *Number of new contracts*. In Panel E, the correlation analysis documents that suppliers with high CSR scores tend to have more customers and more contracts.[14]

4. Effect of CSR information shock on supply-chain contracting

4.1. Baseline results

In our first set of empirical tests, we address our principal research question of whether the CSR information shock affects customer-supplier contracting decisions. Table 2 reports the findings from estimating our difference-in-differences model for our two outcome variables, number of new contracts (Panel A) and number of new customers (Panel B). In both panels, we estimate four different regression specifications: a baseline regression as well as three total effect models based on Eq. (1) that split our treatment group into two non-overlapping groups: (a) suppliers with low (high) CSR ratings, (b) suppliers with low (high) environmental ratings ENV, and (c) suppliers with low (high) social ratings SOC. These three total effects specifications are designed to allow our treatment effect to vary with suppliers' revealed CSR.

The findings in Table 2 offer three main insights. First, the estimated average treatment effect, *POST*×*TREAT*, as reported in columns (1) of Panels A and B, is negative and statistically significant for both outcome variables. This finding suggests that, on average, contracting between the treated suppliers and their corporate customers was negatively affected by the increase in rating coverage. Second, splitting our treated suppliers according to their total, environmental, and social CSR performance (columns (2), (3), and (4), respectively) provides evidence that our average effect is driven by suppliers with low CSR

[11] FactSet Revere data offers several advantages over other traditional sources such as Compustat Segment data. First, the data is not limited to 10-K filings, but also relies on a wider set of non-firm sources. Second, FactSet Revere has unique firm identifiers facilitating matching with other databases (Compustat major customers are solely identified by firm names, making the matching process prone to errors). Third, FactSet Revere data coverage is more comprehensive including non-U.S. and private firms. In contrast, Compustat reveals at most four major customers for each business segment. Hence FactSet Revere is more suitable for capturing supply-chain networks at a granular level.

[12] See Appendix B for more information on Asset4's environmental and social ratings. Asset4 has adjusted the scoring methodology on April 6, 2020, and retroactively modified the historical scores in its database (Berg et al., 2020). Our data was downloaded on January 22, 2020, prior to this methodology change.

[13] Using the number of expired contracts at the supplier-year level controls for variation in re-contracting costs. If, for example, a larger number of contracts expires in a given year, contract negotiation for follow up contracts in this year might be more costly and time-consuming, compared to a situation with fewer expired contracts and follow up negotiations.

[14] Online Appendix K provides detailed information on our sample construction. It documents the contract-level (i.e., customer-supplier pairs) as well as the aggregated supplier-level distribution across years. Given our five-year sample period (2014−2018), the FactSet raw data underlying our sample selection process includes 112,213 customer-supplier pairs and the corresponding number of 13,115 supplier-year observations.

Table 1
Sample description.

Panel A. Sample selection

Selection criteria	**Sample**
Start: U.S. Worldscope universe (2014–2018, with ISIN and year end info available)	37,095
Less observations of firms:	
without WORLDSCOPE/IBES data	(12,389)
without FACTSET SUPPLY CHAIN data (at supplier-year)	(11,808)
without ASSET4 data	(4,400)
outside RUSSELL 1000 & 2000 index	(2,627)
without balanced sample structure	(2,361)
Final sample	3,510

Panel B. Sample distribution per year

	2014	**2015**	**2016**	**2017**	**2018**	**Total**
Control suppliers (RU1000 as of Dec. 2016)	370	370	370	370	370	1,850
Treated suppliers (RU2000 as of Dec. 2016)	332	332	332	332	332	1,660
Total	702	702	702	702	702	3,510

Panel C. Sample distribution per industry

	Russell 1000		Russell 2000	
	Firm-years	Percent	Firm-years	Percent
(1) Consumer Non-Durables	130	7.0%	55	3.3%
(2) Consumer Durables	80	4.3%	95	5.7%
(3) Manufacturing	230	12.4%	235	14.2%
(4) Oil, Gas, and Coal Extraction (Energy)	135	7.3%	55	3.3%
(5) Chemicals and Allied Products	90	4.9%	30	1.8%
(6) Business Equipment	360	19.5%	445	26.8%
(7) Telephone and Television Transmission	55	3.0%	45	2.7%
(8) Utilities	65	3.5%	25	1.5%
(9) Wholesale, Retail, and Some Services	105	5.7%	40	2.4%
(10) Healthcare, Medical Equipment, Drugs	160	8.6%	225	13.6%
(11) Finance	230	12.4%	170	10.2%
(12) Other (e.g., Hotels, Entertainment)	210	11.4%	240	14.5%
Total	1850	100.0%	1660	100.0%

Panel D. Sample description

	Russell 1000 (N=1,850)			Russell 2000 (N=1,660)		
	Mean	Min.	Max.	Mean	Min.	Max.
Factset supply chain variables:						
Number of new contracts per year	16.62	1.00	271.00	11.42	1.00	210.00
Number of customers per year	14.89	1.00	243.00	10.07	1.00	175.00
Number of expired contracts per year	14.99	0.00	783.00	11.71	0.00	226.00
Asset4 CSR scores:						
Mean CSR score	0.66	0.11	0.96	0.24	0.10	0.95
Mean ENV score	0.65	0.11	0.95	0.25	0.11	0.95
Mean SOC score	0.66	0.07	0.97	0.23	0.07	0.95
Asset4 CSR reporting:						
CSR reporting	0.53	0.00	1.00	0.07	0.00	1.00
Rep Risk:						
Total News	17.81	0.00	514	0.70	0.00	53
High Severity News	3.54	0.00	156	0.11	0.00	16
Medium Severity News	8.05	0.00	259	0.31	0.00	29
Low Severity News	6.22	0.00	210	0.29	0.00	24
Worldscope & IBES variables:						
LN(SIZE)	16.34	12.13	19.46	13.84	9.31	17.63
LEV	0.33	0.00	2.56	0.27	0.00	2.97
TQ	0.68	-0.67	3.14	0.63	-0.45	4.39
ROA	0.05	-2.83	0.49	-0.00	-6.64	0.49
GROWTH	0.08	-0.57	7.97	0.16	-0.92	11.54
CFO	0.10	-0.55	0.44	0.06	-5.23	0.44
PPE_TA	0.29	0.00	0.96	0.27	0.00	0.96
LN(FF)	4.47	2.56	4.62	4.35	2.20	4.62
LN(AF)	2.84	0.00	3.40	1.81	0.00	3.40

Table 1 (*continued*)

Panel D. Sample description

	Russell 1000 (N=1,850)			Russell 2000 (N=1,660)		
	Mean	Min.	Max.	Mean	Min.	Max.
RU1000	0.97	0.00	1.00	0.02	0.00	1.00
RU2000	0.02	0.00	1.00	0.97	0.00	1.00

Panel E. Correlations

	1	2	3	4	5	6
1 *Number of new contracts*	1.00					
2 *Number of new customers*	0.99***	1.00				
3 *Mean CSR score*	0.20***	0.20***	1.00			
4 *Mean ENV score*	0.21***	0.21***	0.97***	1.00		
5 *Mean SOC score*	0.18***	0.18***	0.97***	0.89***	1.00	
6 *CSR reporting*	0.16***	0.16***	0.75***	0.75***	0.71***	1.00

Notes: All variables are defined in Appendix A.

performance, which experience significant declines both in their number of new contracts with corporate customers and in their number of new corporate customers.[15] These findings are economically meaningful, with a relative reduction in new contracts of 32% and a loss of clients of around 31% (both relative to the mean).[16] Third, we do not observe a *positive* contracting effect for suppliers with high revealed CSR quality. This finding is not surprising, as our proposed mechanisms (benchmarking and public pressure) primarily apply to low CSR suppliers. For example, public pressure and shaming campaigns are typically targeted at poor (low) CSR firms (e.g., Dyck et al., 2008; Dyreng et al., 2016). The insignificant finding for high CSR suppliers is also consistent with prior CSR research indicating asymmetric market reactions to CSR information, with shareholders putting more weight on negative CSR-related news (e.g., Flammer, 2013; Crifo et al., 2015).[17]

4.2. Who initiates the contracting changes?

While we document a negative effect of the CSR information shock on contractual relations for low CSR suppliers, we cannot directly observe which party initiates the contracting changes, corporate customers or suppliers. Both our channels, benchmarking and public pressure, lead to a prediction that corporate customers make the actual decision, e.g., not to renew a contract with a supplier. We therefore conduct two additional tests to increase our confidence that the observed effects are driven by customer (not supplier) decisions. Specifically, we expect reduced contracting initiated by corporate customers to be contingent on the relative economic importance of the supplier (section 4.2.1) but not contingent on suppliers' financing constraints (section 4.2.2).

4.2.1. Relative economic importance of supplier

If corporate customers (instead of suppliers) change their contracting with low CSR suppliers in response to the CSR information shock, we expect treatment effects to vary with the economic importance (or bargaining power) of suppliers vis-à-vis corporate customers (Dai et al., 2021). For example, corporate customers are less likely to alter their contracting relations with suppliers that are important for the customers' production process.

In our empirical tests, we use six proxies for economic importance: (i) supply-chain relation is disclosed by customer, (ii) supply-chain relation is disclosed by supplier, (iii) customer operates in a more competitive industry vis-à-vis supplier, (iv) supplier operates in a more competitive industry vis-à-vis customer, (v) supplier is important for customer (based on FactSet ranking information), and (vi) customer is important for supplier (based on FactSet ranking information). For each proxy, we count the number of new contracts and new customers at the supplier-year level. To mitigate potential measurement errors of the underlying factors (e.g., Jennings et al., 2020), we then construct two aggregated measures for each of our two contracting variables reflecting supply-chain relationships with high economic importance to customers (*HIGH_ECON_IMPORT*) and those with low economic importance to customers (*LOW_ECON_IMPORT*).

[15] Our inferences are unaffected by alternative specifications that include an additional interaction term for *POST*×*LowCSR* as well as subsample tests based on *LowCSR* RU1000 and RU2000 suppliers (see Online Appendix B). The subsample analysis also suggests a relative decline (rather than a less pronounced increase) in contracting outcomes for *LowCSR* suppliers vis-à-vis *HighCSR* suppliers.

[16] Note that the economic magnitudes in Table 2 represent rather upper bound results for at least three reasons. First, our treated (low CSR) suppliers are on average the smallest firms in the sample with presumably lower bargaining power vis-à-vis corporate customers, likely resulting in stronger treatment effects. Second, and as documented in Sections 4.2 and 5.1, the treatment effect is largely driven by contracts with relatively low economic importance and low relationship-specific investments, respectively, likely increasing the magnitude of the treatment effect. Third, the relative decline in overall contracting value might be smaller than the decline in the number of contracts, our dependent variable.

[17] For example, a firm's removal from the Domini 400 Social Index is accompanied by substantial negative returns while its inclusion does not lead to a strong positive excess return (e.g., Doh et al., 2010; Ramchander et al., 2012). Kruger (2015) also shows that investors respond strongly negatively to bad CSR events and weakly negatively to good CSR events.

Table 2
CSR information and contracting: Baseline results.

Panel A. Number of new contracts with corporate customers per supplier-year

Dependent variable: *Number of new contracts*

	(1)	(2)	(3)	(4)
Conditional variable:		Low CSR of supplier (1=Mean CSR score below median)	Low ENV of supplier (1=Mean ENV score below median)	Low SOC of supplier (1=Mean SOC score below median)
POST×TREAT	-1.619**			
	(-2.04)			
POST×TREAT×Cond. Var. (=1)		-3.237***	-2.129***	-3.338***
		(-4.29)	(-2.73)	(-4.50)
POST×TREAT×Cond. Var. (=0)		0.009	-1.112	0.101
		(0.01)	(-0.89)	(0.07)
F-test for differences: p-value		0.040	0.455	0.030
CSR Reporting	-2.083*	-2.183*	-2.153*	-2.162*
	(-1.86)	(-1.93)	(-1.91)	(-1.92)
LN(SIZE)	0.482	0.508	0.540	0.530
	(0.49)	(0.51)	(0.55)	(0.54)
LEV	-1.176	-0.955	-1.085	-1.165
	(-0.47)	(-0.39)	(-0.44)	(-0.47)
TQ	0.659	0.614	0.620	0.635
	(0.68)	(0.63)	(0.64)	(0.65)
ROA	-1.958	-2.032	-2.043	-2.050
	(-1.46)	(-1.51)	(-1.53)	(-1.52)
GROWTH	-0.018	-0.061	-0.039	-0.056
	(-0.12)	(-0.40)	(-0.26)	(-0.38)
CFO	1.661	1.990	1.820	1.916
	(0.86)	(1.04)	(0.95)	(1.00)
PPE_TA	-4.848	-4.941	-5.005	-4.469
	(-0.97)	(-0.99)	(-1.01)	(-0.89)
LN(FF)	-0.875	-0.906	-0.942	-0.800
	(-0.40)	(-0.42)	(-0.43)	(-0.37)
LN(AF)	0.974	1.091	1.002	1.195
	(0.93)	(1.03)	(0.96)	(1.12)
EXPCONTRACTS	0.247***	0.247***	0.248***	0.248***
	(4.20)	(4.21)	(4.21)	(4.23)
RU2000	-2.784	-2.755	-2.768	-2.679
	(-1.40)	(-1.38)	(-1.39)	(-1.39)
RU1000	-1.928	-1.611	-1.881	-1.746
	(-0.89)	(-0.76)	(-0.87)	(-0.83)
Firm-fixed effects	Included	Included	Included	Included
Year-fixed effects	Included	Included	Included	Included
Adj. R^2	0.524	0.526	0.524	0.526
N	3510	3510	3510	3510

Panel B. Number of corporate customers per supplier-year

Dependent variable: *Number of new customers*

	(1)	(2)	(3)	(4)
Conditional variables:		Low CSR of supplier (1=Mean CSR score below median)	Low ENV of supplier (1=Mean ENV score below median)	Low SOC of supplier (1=Mean SOC score below median)
POST×TREAT	-1.710**			
	(-2.67)			
POST×TREAT×Cond. Var. (=1)		-2.901***	-1.921***	-2.949***
		(-3.91)	(-2.99)	(-4.03)
POST×TREAT×Cond. Var. (=0)		-0.512	-1.500	-0.471
		(-0.55)	(-1.62)	(-0.52)
F-test for differences: p-value		0.041	0.665	0.026
CSR Reporting	-1.621**	-1.723**	-1.636**	-1.718**
	(-2.10)	(-2.19)	(-2.10)	(-2.18)
LN(SIZE)	0.511	0.571	0.539	0.628
	(0.75)	(0.85)	(0.80)	(0.95)
LEV	-0.583	-0.568	-0.565	-0.643
	(-0.22)	(-0.22)	(-0.22)	(-0.25)
TQ	0.792	0.708	0.781	0.689
	(1.06)	(0.97)	(1.04)	(0.91)
ROA	-1.624*	-1.723*	-1.666*	-1.773*
	(-1.77)	(-1.82)	(-1.73)	(-1.84)

Table 2 (*continued*)

Panel B. Number of corporate customers per supplier-year				
Dependent variable: *Number of new customers*				
	(1)	(2)	(3)	(4)
Conditional variables:		Low CSR of supplier (1=Mean CSR score below median)	Low ENV of supplier (1=Mean ENV score below median)	Low SOC of supplier (1=Mean SOC score below median)
GROWTH	-0.074	-0.121	-0.080	-0.123
	(-0.76)	(-1.11)	(-0.80)	(-1.12)
CFO	1.866	2.088	1.923	2.165
	(1.42)	(1.61)	(1.45)	(1.63)
PPE_TA	-1.650	-1.704	-1.625	-1.341
	(-0.39)	(-0.41)	(-0.39)	(-0.32)
LN(FF)	0.472	0.509	0.449	0.521
	(0.21)	(0.22)	(0.20)	(0.23)
LN(AF)	0.334	0.454	0.336	0.563
	(0.24)	(0.33)	(0.24)	(0.41)
EXPCONTRACTS	0.207***	0.206***	0.206***	0.206***
	(3.21)	(3.23)	(3.21)	(3.19)
RU2000	-3.192	-3.171	-3.186	-3.117
	(-1.55)	(-1.53)	(-1.54)	(-1.55)
RU1000	-2.679	-2.446	-2.660	-2.548
	(-1.29)	(-1.20)	(-1.28)	(-1.26)
Firm-fixed effects	Included	Included	Included	Included
Year-fixed effects	Included	Included	Included	Included
Adj. R^2	0.540	0.541	0.540	0.541
N	3510	3510	3510	3510

Notes: All regressions are estimated based on weights (*pweights*) taken from an entropy balancing estimation. The entropy balancing estimation is based on pre-treatment levels of our key main outcome variables (number of new contracts, number of new customers, and sales growth) as well as industry membership to address concerns for non-parallel trends between our treatment and control group (e.g., Heckman et al., 1998; Ryan et al., 2015; Lindner and McConnell, 2019). Findings are virtually identical when using analytical weights (*aweight*) instead of probability weights (*pweights*). Panel C of Table 1 reports results from estimating linear probability regressions. All variables are defined in Appendix A. ***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively, using two-tailed tests and standard errors clustered at the industry level.

Table 3 Panel A reports findings from estimating our baseline analyses using modified outcome variables: number of contracts based on supply-chain relationships with high (low) economic importance (Columns 1 and 2) and number of new customers based on supply-chain relationships with high (low) economic importance (Columns 3 and 4). If corporate customers (not suppliers) initiate contracting changes in response to the CSR information shock, we expect our treatment effects to be more pronounced for contractual relationships with low economic importance. Consistent with this, findings in Table 3 show significantly stronger treatment effects (both in terms of economic magnitude and statistical significance) for contractual relations with low economic importance to corporate customers.[18]

4.2.2. Suppliers' financing constraints

One reason suppliers may reduce contracting after the information shock is that revelation of their poor CSR performance potentially reduces their access to external credit (Cheng et al., 2014). In response to these increased financing constraints, suppliers may reduce their trade credit, reduce their output, or raise prices, all of which will involve renegotiating contracts with their corporate customers (Costello, 2020). In this scenario, suppliers under financing constraints, rather than customers, might initiate contracting decisions. To address this concern, we estimate our difference-in-differences model using as outcome variable the Whited and Wu (2006) financial constraints index. Our findings in Table 3 Panel B do not indicate reduced access to external credit for low CSR treated suppliers, as coefficient estimates for *POSTxTreatxLowCSR* are insignificant for all specifications.

4.3. Parallel trends and alternative matching strategies

One critical underpinning to our identification approach is the parallel-trends assumption, i.e., the assumption that our control firms represent valid counterfactuals to our treated firms, indicating the hypothetical development of supply-chain contracting for our treated firms had they not been treated (e.g., Atanasov and Black, 2016; Glaeser and Guay, 2017). The parallel-trends assumption is not directly testable. However, its plausibility can be investigated by checking for parallel trends during the pre-treatment period (Atanasov and Black, 2016).

[18] Online Appendix J provides the respective findings of the six underlying proxies. The findings are generally consistent with our aggregated findings in Table 3.

Table 3
Who initiates the actual contracting decisions?.

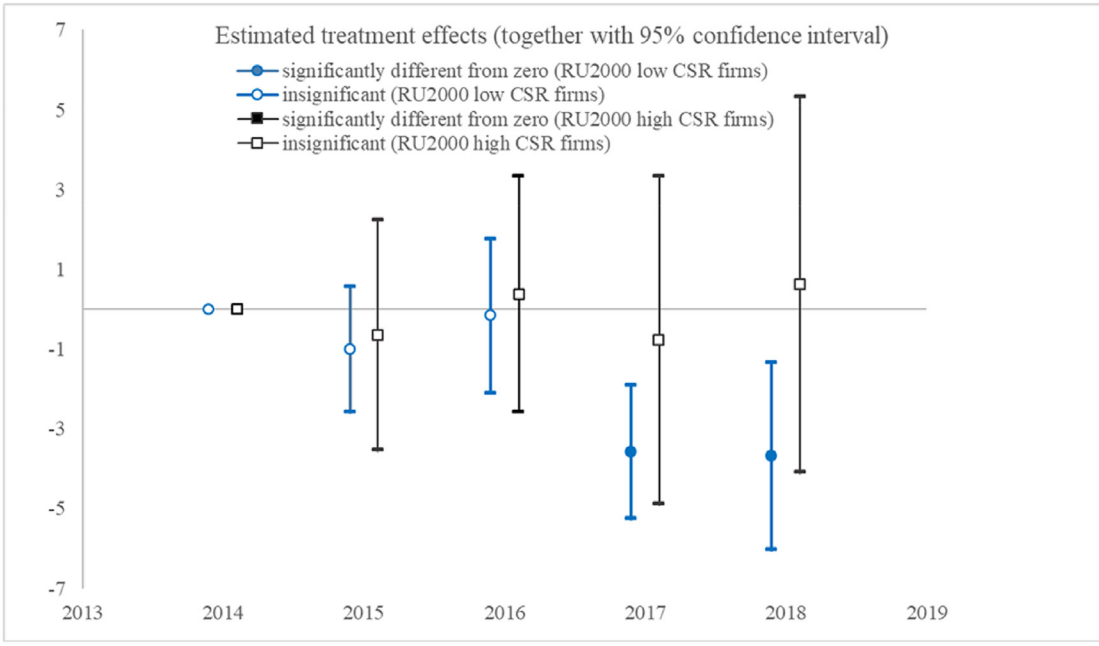
Panel A. Economic importance of supplier				
Dependent variables:	Number of new contracts based on supply-chain relationships identified as:		Number of new customers based on supply-chain relationships identified as:	
	HIGH_ECON_IMPORT	*LOW_ECON_IMPORT*	*HIGH_ECON_IMPORT*	*LOW_ECON_IMPORT*
	(1)	(2)	(3)	(4)
POST×TREAT×Low CSR$_{supplier}$	-0.272	-2.965***	-0.429	-2.506***
	(-0.91)	(-4.47)	(-1.63)	(-4.41)
POST×TREAT×High CSR$_{supplier}$	0.630	-0.621	0.210	-0.780
	(1.39)	(-0.68)	(0.58)	(-1.06)
F-test (High vs. Low): p-value	0.057	0.009	0.093	0.020
Chi2 test (Low vs. Low): p-value	0.000		0.000	
Control variables	Included	Included	Included	Included
Firm-fixed effects	Included	Included	Included	Included
Year-fixed effects	Included	Included	Included	Included
Adj. R^2	0.492	0.558	0.497	0.583
N	3510	3510	3510	3510
Panel B. Financial Constraints				
Dependent variable: *Financial Constraint Index*				
	(1)	(2)	(3)	(4)
Conditional variables:		Low CSR of supplier (1=Mean CSR score below median)	Low ENV of supplier (1=Mean ENV score below median)	Low SOC of supplier (1=Mean SOC score below median)
POST×TREAT	-0.009			
	(-0.27)			
POST×TREAT×Cond. Var. (=1)		0.075	0.045	0.056
		(0.48)	(0.31)	(0.41)
POST×TREAT×Cond. Var. (=0)		-0.094	-0.063	-0.075
		(-0.63)	(-0.47)	(-0.58)
F-test for differences: p-value		0.575	0.692	0.615
Control variables	Included	Included	Included	Included
Firm-fixed effects	Included	Included	Included	Included
Year-fixed effects	Included	Included	Included	Included
Adj. R^2	0.114	0.116	0.115	0.115
N	3510	3510	3510	3510

Notes: *HIGH_ECON_IMPORT* and *LOW_ECON_IMPORT* are composite measures. *HIGH_ECON_IMPORT* is the weighted average number of contracts or customers based on (i) supply chain relation disclosed by customer, (ii) less industry competition among suppliers than customers, and (iii) supplier is important for customer based on FactSet ranking information. *LOW_ECON_IMPORT* is the weighted average number of contracts or customers based on (i) supply chain relation disclosed by supplier, (ii) less industry competition among customers than suppliers, and (iii) customer is important for supplier based on FactSet ranking information. The Chi2 test compares the coefficient estimate of *POST×TREAT×Low CSR$_{supplier}$* across *HIGH_ECON_IMPORT* and *LOW_ECON_IMPORT*. All variables are defined in Appendix A. Regressions include same set of control variables and fixed effects as well as are estimated based on weights (*pweights*) taken from an entropy balancing estimation as introduced in Table 2. Online Appendix J provides results for the underlying proxies. ***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively, using two-tailed tests and standard errors clustered at the industry level.

We gauge the plausibility of the parallel-trends assumption by estimating yearly treatment effects (with the year 2014 as the benchmark year). For expositional purposes, we focus on the treatment split based on the comprehensive CSR rating. Figures 1A (for new contracts) and 1B (for new customers) illustrate the results by plotting point-estimates (together with two-tailed 95% confidence intervals) for all four yearly treatment effects for both low CSR suppliers and high CSR suppliers (Online Appendix C tabulates the underlying regression results). Graphical inspection of Fig. 1A and B reveals two insights. First, treatment effects in the pre-treatment period (2015−2016) are insignificant for both sets of firms, which means that we find no evidence of different pre-trends between our treatment and our control firms with respect to our two outcome variables. Second, the treatment effect of our CSR information shock turns out sufficiently sharp, as it obtains when it should (Atanasov and Black, 2016): As early as 2017, the treatment effect is significantly negative for low CSR suppliers, while high CSR suppliers do not experience significant changes in their supply-chain contracting, relative to the control group. In additional analyses, we repeat this inspection of pre-treatment trends for an extended pre-shock period of five years (2012−2016) instead of three years (2014−2016), and we find no significant pre-treatment trends between treatment and control firms.[19] Taken together, these yearly difference-in-differences results provide some confidence about the plausibility of the parallel-trends assumption.

[19] See Online Appendix L. Extending the sample period by including years 2012 and 2013 reduces the number of unique firm observations in our balanced sample from 702 to 560.

A. Number of new contracts



B. Number of new customers

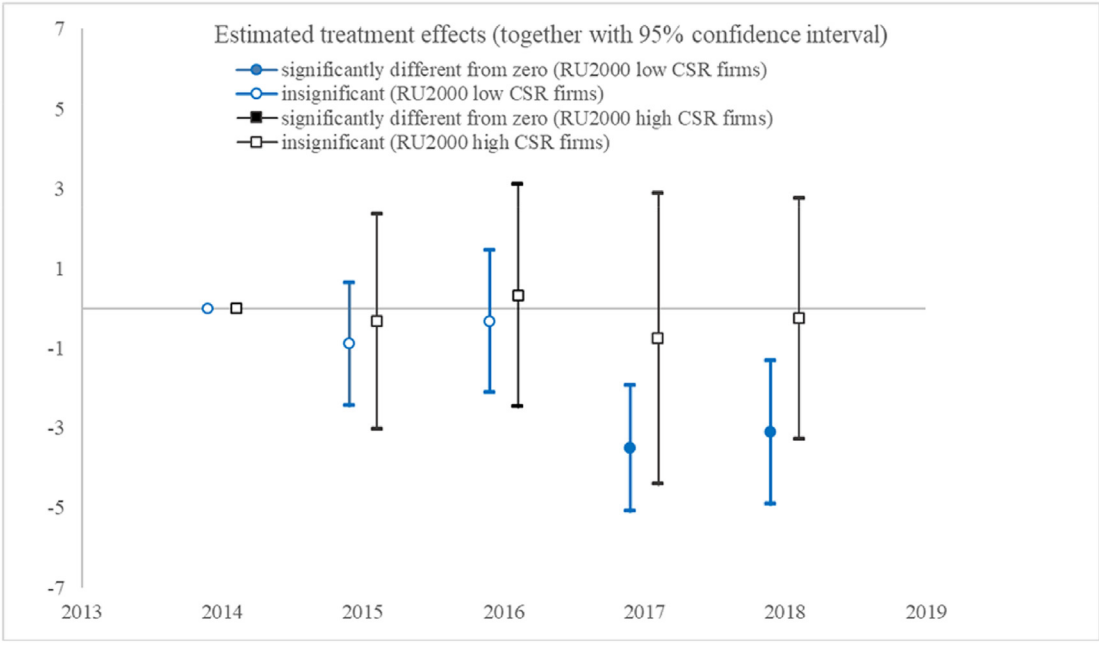


Fig. 1. Treatment effects over time. Notes: This figure illustrates treatment effects over time. The point-estimates are generated by estimating the following regression model (without subscripts): DV = β_0 + $\beta_1$2015 × $TREAT_{LowCSR}$ + $\beta_2$2015 × $TREAT_{HighCSR}$ + $\beta_3$2016 × $TREAT_{LowCSR}$ + $\beta_4$2016 × $TREAT_{HighCSR}$ + $\beta_5$2017 × $TREAT_{LowCSR}$ + $\beta_6$2017 × $TREAT_{HighCSR}$ + $\beta_7$2018 × $TREAT_{LowCSR}$ + $\beta_8$2018 × $TREAT_{HighCSR}$ + Controls + FE + ε. As we omit the indicators 2014 × $TREAT_{LowCSR}$ and 2014 × $TREAT_{HighCSR}$, the year 2014 serves as the benchmark year. The solid points indicate point-estimates and the lines represent 95% confidence intervals.

Next, we assess the sensitivity of our results to the choice of our matching strategy, i.e., entropy balancing. We re-estimate our baseline model using unmatched treatment and control samples as well as propensity score matched samples. Results of these tests (reported in Online Appendix D) are in line with our main findings (as tabulated in Table 2). In particular, we find very similar economic magnitudes and significance levels for all three specifications, suggesting a low sensitivity of the results to the choice of matching strategies.

4.4. Construct validity

4.4.1. Change in the number of expired contracts?

We replicate our baseline analyses with an alternative (placebo) contracting variable as the dependent variable: the annual number of expired contracts. The underlying idea is to test whether our main outcome variables respond to the treatment (CSR information shock) instead of omitted factors from the pre-treatment period. The advantage of the variable "number of expired contracts" is that it only relates to pre-treatment conditions and potential omitted factors from the pre-treatment period (because the underlying contracts date back to the pre-treatment period) but is unrelated to the actual treatment event. Since the average contract duration of Russell 1000 (Russell 2000) suppliers in our sample spans 450 days (427 days), it is highly implausible that corporate customers would—in response to the CSR information shock in 2017—cancel existing contracts that would expire anyway in the post-treatment period. Instead, and as shown in Table 2, corporate customers are more likely to reduce new or follow up contracts. We therefore do not expect a significant treatment effect for our placebo test using the number of expired contracts as outcome variable. The corresponding results (insignificant treatment effects) in Online Appendix G are in line with this expectation.

4.4.2. Change in customers' disclosure behavior?

Another concern is that changes in customers' disclosures about their contractual relations with suppliers rather than *real* contracting changes in response to our CSR information shock explain our baseline findings in Table 2. If customers have some discretion over their supply-chain reporting (e.g., by terminating disclosures about specific supply chain relations), they could (alternatively) respond to our CSR information shock by becoming opaque about their relations to low CSR Russell 2000 suppliers. This in turn could lead to a decline in *observable* contracts and customers.[20]

We address this disclosure concern by estimating our baseline model for an alternative (placebo) dependent variable, the percentage of contracts disclosed by customers per supplier-year. If our main findings reflect *real* rather than observable contracting changes, we do not expect changes in these disclosed contracts. We use Factset data to define, at the supplier-year level, the placebo variable *Percentage of contracts disclosed by customers* by all customers of the supplier (i.e., customer disclosed contracts as a percentage of all contracts for the supplier-year in the database).[21] The results reported in Online Appendix H do not suggest a significant decrease in disclosed contracts by corporate customers. This increases confidence that our main findings in Table 2 reflect real contracting changes, rather than corporate customers' choice to discontinue disclosure of their relations with low CSR Russell 2000 suppliers.

4.4.3. Within treatment group tests

The CSR information shock potentially also affects our control group, the Russell 1000 firms. This is because, by expanding the universe of peer firms to Russell 2000 firms, the Asset4 coverage expansion also facilitates comparison of newly covered suppliers with previously covered Russell 1000 suppliers. We address this concern in two additional sets of tests. First, we perform subsample tests within Russell 2000, defining treated suppliers as firms with low CSR (low ENV or low SOC). Consistent with our baseline results, this test shows significant and negative treatment effects for both our outcome variables (Online Appendix I). Second, we employ synthetic control group matching separately for our Russell 2000 suppliers and the Russell 1000 suppliers. This approach visualizes the parallel-trends assumption for our outcome variable and its degree of pre-treatment differences. Moreover, synthetic control group matching is a useful alternative method in our setting to illustrate *within* treatment effects (low CSR Russell 2000 suppliers versus high CSR Russell 2000 suppliers) as well as placebo tests based on within control group effects (low CSR Russell 1000 suppliers versus high CSR Russell 1000 suppliers).

Fig. 2A and C, respectively, document the annual number of new contracts and new customers over time for synthetic low CSR Russell 2000 suppliers and high CSR Russell 2000 suppliers. The plotted results suggest that, while pre-treatment trends across low CSR Russell 2000 suppliers and high CSR Russell 2000 suppliers exhibit a similar pattern, contracting deteriorates for low CSR suppliers vis-à-vis high CSR suppliers in the post-period. In comparison, Fig. 2B and D plot the annual number of new contracts and new customers, respectively, over time for synthetic low CSR Russell 1000 suppliers versus high CSR Russell 1000 suppliers. If anything, these graphs indicate a marginal increase in contracting for low CSR Russell 1000 suppliers, rather than a decrease.

Two takeaways emerge from these analyses. First, we find evidence consistent with our main finding of a negative treatment (contracting) effect for low CSR Russell 2000 suppliers, which experience a decline in the number of contracts and

[20] This would assume that FactSet cannot offset customers' disclosure choices by retrieving the same information from the supplier side.

[21] Factset provides data on whether a contract is disclosed by the supplier or the corporate customer. Factset collects this information from either customer- or supplier-related public sources (e.g., firms' regulatory filings, websites, press releases, investor presentations).

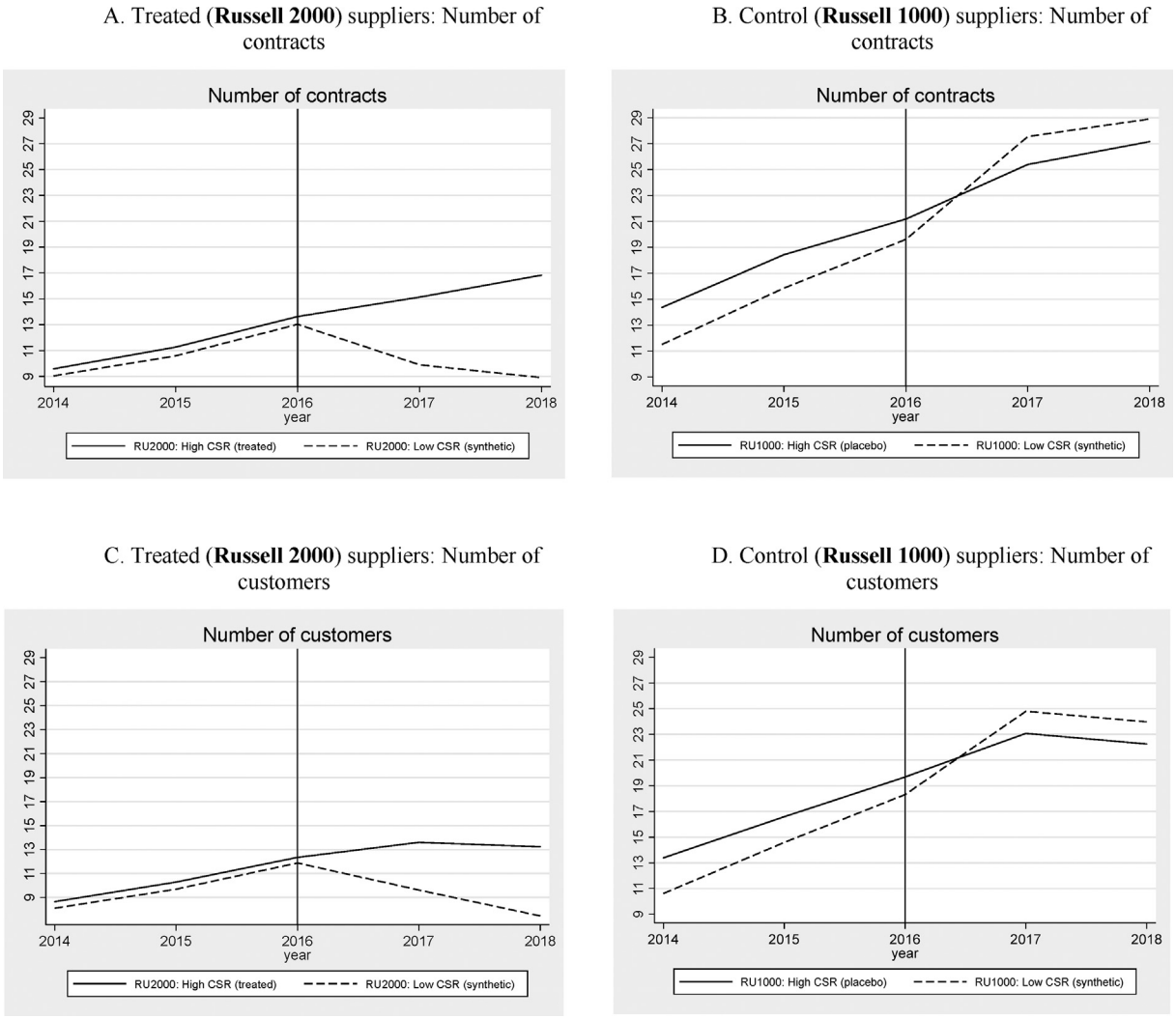


Fig. 2. Synthetic control group matching. Notes: Fig. 2 plots the average *Number of contracts* and the average *Number of customers* over the five years of our sample period. The solid line in Fig. 2A and C (Fig. 2B and D) represents high CSR Russell 2000 suppliers (high CSR Russell 1000 suppliers), whereas the dashed line represents a synthetic control group of low CSR Russell 2000 suppliers (low CSR Russell 1000 suppliers). For synthetic control group matching, see Abadie and Gardeazabal (2003), Abadie et al. (2010), Abadie (2021).[34]

customers. Second, our findings suggest a potential positive externality (spillover) of the CSR information shock for low CSR Russell 1000 suppliers, which appear to benefit from being more comparable with the newly covered Russell 2000 firms, because their CSR quality is high, relative to these Russell 2000 suppliers.[22] This is a casual observation, however, as data limitations (we cannot trace contract movements) do not allow us to observe how customers compensate for or shift their reduced contracting volume with low CSR Russell 2000 suppliers.

5. The role of benchmarking and public pressure

In this section, we shed more light on our main effects by exploring whether the treatment effect exhibits plausible variation with respect to our two channels: (i) corporate customers benchmarking their suppliers based on relative CSR (Section 5.1) and (ii) corporate customers yielding to (expected) public pressure to ensure sufficient levels of CSR along their supply chains (Section 5.2).

[22] For example, the mean CSR score of low Russell 1000 firms is 0.43, whereas the mean CSR score for high (low) CSR Russell 2000 firms is 0.36 (0.13).

Table 4
CSR information and contracting: The role of benchmarking.

Panel A. Information asymmetry

Dependent variables:	Number of new contracts based on supply-chain relationships identified as:		Number of new customers based on supply-chain relationships identified as:	
	HIGH_INFO_ASYMMETRY	*LOW_INFO_ASYMMETRY*	*HIGH_INFO_ASYMMETRY*	*LOW_INFO_ASYMMETRY*
	(1)	(2)	(3)	(4)
POST×TREAT×Low CSR$_{supplier}$	-2.626***	-0.611**	-2.455***	-0.481**
	(-3.74)	(-2.17)	(-3.86)	(-2.18)
POST×TREAT×High CSR$_{supplier}$	-0.056	0.065	-0.433	-0.137
	(-0.05)	(0.18)	(-0.49)	(-0.51)
F-test (High vs. Low): p-value	0.013	0.084	0.023	0.233
Chi2 test (Low vs. Low): p-value	0.000		0.000	
Control variables	Included	Included	Included	Included
Firm-fixed effects	Included	Included	Included	Included
Year-fixed effects	Included	Included	Included	Included
Adj. R^2	0.514	0.303	0.555	0.431
N	3510	3510	3510	3510

Panel B. Variation in Asset4 industry coverage

Dependent variables:	Number of new contracts		Number of new customers	
Subsample:	Suppliers in industries with below average pre-treatment Asset4 coverage			
	Yes	No	Yes	No
	(1)	(2)	(3)	(4)
POST×TREAT×Low CSR$_{supplier}$	-3.800***	-1.782	-3.686***	-1.253
	(-2.99)	(-1.16)	(-2.96)	(-0.97)
POST×TREAT×High CSR$_{supplier}$	0.489	-0.490	-0.490	-0.645
	(0.36)	(-0.26)	(-0.63)	(-0.51)
F-test (High vs. Low): p-value	0.011	0.603	0.033	0.737
Chi2 test (Low vs. Low): p-value	0.286		0.145	
Control variables	Included	Included	Included	Included
Firm-fixed effects	Included	Included	Included	Included
Year-fixed effects	Included	Included	Included	Included
Adj. R^2	0.593	0.462	0.590	0.490
N	1520	1990	1520	1990

Notes: *HIGH_INFO_ASYMMETRY* and *LOW_INFO_ASYMMETRY* are composite measures. *HIGH_INFO_ASYMMETRY* is the weighted average number of contracts or customers based on (i) supplier is in a different industry as customer, (ii) supplier with short-term relationships, and (iii) supplier and customer have low contracting intensity. *LOW_INFO_ASYMMETRY* is the weighted average number of contracts or customers based on (i) supplier is in the same industry as customer, (ii) supplier with long-term relationships, and (iii) supplier and customer have high contracting intensity. The Chi2 test compares the coefficient estimate of *POST×TREAT×Low CSR$_{supplier}$* across *HIGH_INFO_ASYMMETRY* and *LOW_INFO_ASYMMETRY* (or across industries with below or above Asset4 coverage). All variables are defined in Appendix A. All regressions are estimated based on weights (*pweights*) taken from an entropy balancing estimation (as described in the notes section of Table 2). Online Appendix E provides results for the underlying proxies. ***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively, using two-tailed tests and standard errors clustered at the industry level.

5.1. Benchmarking

We perform two sets of tests that explore whether the negative effect of the CSR information shock on low CSR suppliers' contracting varies consistent with corporate customers benchmarking their suppliers based on relative CSR. First, we expect this benchmarking effect to increase with the degree of information asymmetry between suppliers and customers at the time of the shock. In the presence of disclosure processing costs, the information that corporate customers have about their suppliers varies. For example, corporate customers with close (e.g., long-term) contracting relations likely possess better information about their suppliers than customers with less close (e.g., short-term) contracting relations. Customers' information also likely affects their ability to create their own natural reference points (e.g., through industry expertise) or to assess the time series distribution of their suppliers (e.g., to form absolute rankings relative to the suppliers' own track record).

We use six proxies to empirically measure the information asymmetry between customers and suppliers. First, we identify whether suppliers and customers do (not) operate within the same industry. The idea behind this differentiation is that customer-supplier pairs across industries face a higher *operational distance* and thus higher information asymmetry, compared to pairs in the same industry. Second, we use suppliers' average (pre-shock) contractual durations to identify

[34] Our firm-year setting differs along several dimensions to the standard application of synthetic control group matching (e.g., Abadie and Gardeazabal, 2003; Abadie et al., 2010, 2015; Abadie, 2021). For one thing, our setting is not limited to only one treatment observation and a set of control observations, which would impede any plain vanilla regression technique. In addition, and given our relative short sample period, we are not able to assess the predictive power based on training and validation periods. Finally, we note that, given the complexity of our "repeated" estimation design (i.e., in which we estimate synthetic controls for each treated firm individually and plot the average per group), we cannot easily map out the individual weights of the donor pool and abstain from including any predictors or manipulate the donor pool (individually for each treated firm) to increase the fit of the synthetic control group.

suppliers with long-term (versus short-term) business relations. The idea is that contracting duration is positively associated with corporate customers' *relationship-specific investments* into their suppliers (and their subsequent supplier-specific information endowment). Third, we measure the contracting intensity (high versus low) for each supplier-customer pair. This differentiation also follows the idea of relationship-specific investments and subsequent supplier-specific information. For each proxy, we again count the number of new contracts and new customers at the supplier-year level. We then construct two aggregated measures for each of our two contracting variables reflecting supply-chain relationships with high (*HIGH_INFO_ASYMMETRY*) and those with low (*LOW_INFO_ASYMMETRY*) information asymmetry.

We replicate our baseline analyses using these modified outcome variables. The results in Panel A of Table 4 show that the negative treatment effect for both of our outcome variables is more pronounced (both in terms of economic magnitude and statistical significance) for low CSR suppliers that operate in high information asymmetry business relationships. In Online Appendix E, we also show that the inferences obtain across the various underlying contract characteristic proxies. These findings are consistent with the benchmarking channel.

In our second set of tests, we differentiate suppliers according to the Asset4 rating coverage within their industry at the time of the information shock (coverage increase). This is to identify suppliers with a relatively high (low) increase in coverage of their industry peers. As benchmarking by customers is about relative evaluation of their suppliers' CSR, we expect the magnitude of the information shock and thus benchmarking effects on contracting to be larger when previous coverage of suppliers' industry peers was relatively low. Subsample findings reported in Panel B of Table 4 are in line with this prediction. For both outcome variables, the negative contracting effect is concentrated in low CSR suppliers from industries that experience high increases in coverage.

5.2. Public pressure

To shed light on our second proposed mechanism, we use four proxies that relate to customer visibility. First, we identify supplier contracts with listed (nonlisted) corporate customers. Listed firms generally face higher regulatory risks, are more visible, and their managers are more sensitive to share price (volatility). Therefore listed (nonlisted) customers are likely more (less) concerned about revelation of potentially unfavorable CSR performance of their suppliers. Second, we posit that customer visibility relates to the customer's business model, business-to-consumer (B2C) versus business-to-business (B2B). Visibility of socially responsible investments plays an important role for individuals' decisions, especially for customers, and this visibility is higher for final products, particularly consumer products (Bénabou and Tirole, 2010). Therefore firms with business-to-consumer (business-to-business) business models are more (less) likely exposed to potential pressure by customers or by NGOs enforcing customers' preferences. For each proxy, we again count the number of new contracts and new customers at the supplier-year level. We then construct two aggregated measures for each of our two contracting outcome variables reflecting contracts and customers based on supply-chain relationships with high visibility (*HIGH_VISIBILITY*) and those with low visibility (*LOW_VISIBILITY*).

Panel A of Table 5 shows that the negative treatment effects for low CSR suppliers for both outcome variables are more pronounced (both in terms of economic magnitude and statistical significance) for *HIGH_VISIBILITY* customer-supplier relationships. In Online Appendix F, we also show that our inferences are largely consistent across the underlying contract characteristic proxies. These findings support our proposed public pressure channel.

We shed additional light on the public pressure channel by using two measures of supplier (instead of customer) visibility. First, we posit that the visibility of suppliers is associated with their position in the supply chain, because it is more difficult for stakeholders (e.g., CSR sensitive customers or NGOs) to identify and pressure suppliers that are further down the supply chain. For example, while it may be easy to identify and scrutinize the supplier of tires to a car manufacturer, such an investigation gets more cumbersome once stakeholders attempt to identify the suppliers of rubber to the tire manufacturer. Our second measure of suppliers' visibility is media attention. Revelation of low CSR quality for firms that have been in the media spotlight makes them an easier target for activist campaigns (e.g., Watts and Zimmerman, 1978). Similarly, the reputational costs of negative CSR coverage, e.g., in the shape of increased regulatory scrutiny, are likely augmented by public scrutiny and visibility of the supply-chain relation. To proxy for media attention, we employ RepRisk and measure negative media coverage of suppliers' material CSR risks and violations.[23]

In line with our predictions, Panels B and C of Table 5 show that the negative treatment effects for low CSR suppliers for both outcome variables are concentrated in customer-supplier pairs where suppliers are subject to relatively high visibility: suppliers operating in the middle of the supply chain as opposed to those at the bottom (columns (1) and (2)) and suppliers with negative CSR-related media attention prior to 2017 (columns (3) and (4)).

Taken together, our analyses in Section 5 demonstrate that our main treatment effect exhibits variation that is consistent with both our proposed channels. While we cannot rule out additional mechanisms at work, this cross-sectional variation of our treatment effect increases confidence in the causal effect of the CSR information shock on customer-supplier contracting decisions.

[23] We use the RepRisk database to identify suppliers with high (pre-shock) media attention, which we measure using the incidence of negative CSR-related news coverage in the years before the coverage increase in 2017. Out of the 332 suppliers in our treatment sample, we identify 212 firms (63.85%) with negative news coverage. A subset of firm-years in our sample (1,180 observations) cannot be linked to the RepRisk dataset. We assume these firms do not have media coverage and replace the missing values of news with zero. Our results are robust to replicating our analysis in a subsample of firms with nonmissing RepRisk data.

Table 5
CSR information and contracting: The role of public pressure.

Panel A. Visibility of customer				
Dependent variables:	Number of new contracts based on supply-chain relationships identified as:		Number of new customers based on supply-chain relationships identified as:	
	HIGH_VISIBILITY	*LOW_VISIBILITY*	*HIGH_VISIBILITY*	*LOW_VISIBILITY*
	(1)	(2)	(3)	(4)
POST×*TREAT*×*Low CSR*$_{supplier}$	-2.264***	-0.973**	-1.948***	-0.987**
	(-4.26)	(-2.11)	(-4.79)	(-2.25)
POST×*TREAT*×*High CSR*$_{supplier}$	-0.512	0.521	-0.781	0.211
	(-0.60)	(0.84)	(-1.50)	(0.44)
F-test (High vs. Low): p-value	0.037	0.079	0.039	0.079
Chi2 test (Low vs. Low): p-value	0.026		0.011	
Control variables	Included	Included	Included	Included
Firm-fixed effects	Included	Included	Included	Included
Year-fixed effects	Included	Included	Included	Included
Adj. R^2	0.540	0.495	0.568	0.497
N	3510	3510	3510	3510
Panel B. Middle versus bottom position of supplier in the supply chain				
Dependent variables:	Number of new contracts		Number of new customers	
Subsample:	Supplier's position within the supply chain			
	Middle	Bottom	Middle	Bottom
	(1)	(2)	(3)	(4)
POST×*TREAT*×*Low CSR*$_{supplier}$	-5.176***	-1.336	-4.326***	-1.595
	(-3.77)	(-0.77)	(-3.55)	(-0.98)
POST×*TREAT*×*High CSR*$_{supplier}$	-0.785	1.752	-0.356	0.366
	(-0.55)	(0.80)	(-0.33)	(0.24)
F-test (High vs. Low): p-value	0.044	0.118	0.031	0.142
Chi2 test (Low vs. Low): p-value	0.006		0.018	
Control variables	Included	Included	Included	Included
Firm-fixed effects	Included	Included	Included	Included
Year-fixed effects	Included	Included	Included	Included
Adj. R^2	0.606	0.389	0.632	0.390
N	1940	1570	1940	1570
Panel C. Media attention of supplier				
Dependent variables:	Number of new contracts		Number of new customers	
Subsample:	Suppliers with at least one negative CSR-related news coverage prior to 2017			
	Yes	No	Yes	No
	(1)	(2)	(3)	(4)
POST×*RU2000*×*Low CSR*$_{supplier}$	-4.09***	-1.68	-3.21***	-2.03*
	(-3.09)	(-1.37)	(-2.89)	(-1.79)
POST×*RU2000*×*High CSR*$_{supplier}$	-1.43	1.96	-1.61	0.80
	(-0.73)	(1.08)	(-1.09)	(0.52)
F-test (High vs. Low): p-value	0.209	0.041	0.322	0.057
Chi2 test (Low vs. Low): p-value	0.009		0.033	
Control variables	Included	Included	Included	Included
Firm-fixed effects	Included	Included	Included	Included
Year-fixed effects	Included	Included	Included	Included
Adj. R^2	0.544	0.511	0.572	0.516
N	1790	1720	1790	1720

Notes: *HIGH_VISIBILITY* and *LOW_VISIBILITY* are composite measures. *HIGH_VISIBILITY* is the weighted average number of contracts and customers based on (i) corporate customer is listed, and (ii) corporate customer operates in B2C industries. *LOW_VISIBILITY* is the weighted average number of contracts and customers based on (i) corporate customer is not listed, and (ii) corporate customer operates in B2B industries. The Chi2 test compares the coefficient estimate of *POST*×*TREAT*×*Low CSR*$_{supplier}$ across *HIGH_VISIBILITY* and *LOW_VISIBILITY* (or middle vs. bottom of supply chain or negative vs. non-negative CSR-related news coverage). All variables are defined in Appendix A. All regressions are estimated based on weights (*pweights*) taken from an entropy balancing estimation (as described in the notes section of Table 2). Online Appendix F provides results for the underlying proxies. ***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively, using two-tailed tests and standard errors clustered at the industry level.

6. Additional analyses

In this section, we provide two additional sets of tests that investigate whether the documented reduction in contracting for low CSR suppliers also affects suppliers' financial (Section 6.1) and nonfinancial (CSR) performance (Section 6.2).

Table 6
CSR information shock and suppliers' financial and non-financial performance.

Panel A. Sales Growth				
Dependent variable: *Sales Growth*	(1)	(2)	(3)	(4)
Conditional variables:		Low CSR of supplier (1=Mean CSR score below median)	Low ENV of supplier (1=Mean ENV score below median)	Low SOC of supplier (1=Mean SOC score below median)
POST×TREAT	-0.052***			
	(-3.19)			
POST×TREAT×Cond. Var. (=1)		-0.161***	-0.138***	-0.166***
		(-3.46)	(-3.32)	(-3.69)
POST×TREAT×Cond. Var. (=0)		0.057	0.033	0.061
		(0.95)	(0.73)	(1.11)
F-test for differences: p-value		0.032	0.035	0.017
Control variables	Included	Included	Included	Included
Firm-fixed effects	Included	Included	Included	Included
Year-fixed effects	Included	Included	Included	Included
Adj. R^2	0.195	0.198	0.197	0.199
N	3510	3510	3510	3510
Panel B. ROA				
Dependent variable: *ROA*	(1)	(2)	(3)	(4)
Conditional variables:		Low CSR of supplier (1=Mean CSR score below median)	Low ENV of supplier (1=Mean ENV score below median)	Low SOC of supplier (1=Mean SOC score below median)
POST×TREAT	-0.004			
	(-0.46)			
POST×TREAT×Cond. Var. (=1)		-0.012	-0.018*	-0.015
		(-1.22)	(-1.81)	(-1.45)
POST×TREAT×Cond. Var. (=0)		0.004	0.010	0.007
		(0.47)	(0.87)	(0.70)
F-test for differences: p-value		0.111	0.058	0.068
Control variables	Included	Included	Included	Included
Firm-fixed effects	Included	Included	Included	Included
Year-fixed effects	Included	Included	Included	Included
Adj. R^2	0.771	0.772	0.772	0.772
N	3510	3510	3510	3510
Panel C. CSR violations based on indicator variable				
Dependent variable: *CSR_VIOLATION*	(1)	(2)	(3)	(4)
Conditional variables:		Low CSR of supplier (1=Mean CSR score below median)	Low ENV of supplier (1=Mean ENV score below median)	Low SOC of supplier (1=Mean SOC score below median)
POST×TREAT	-0.053			
	(-0.97)			
POST×TREAT×Cond. Var. (=1)		-0.196**	-0.137*	-0.151**
		(-2.55)	(-1.77)	(-2.15)
POST×TREAT×Cond. Var. (=0)		0.008	-0.007	-0.005
		(0.13)	(-0.10)	(-0.08)
F-test for differences: p-value		0.024	0.194	0.088
Control variables	Included	Included	Included	Included
Firm-fixed effects	Included	Included	Included	Included
Year-fixed effects	Included	Included	Included	Included
Adj. R^2	0.205	0.208	0.206	0.207
N	1865	1865	1865	1865
N of Cond. Var. (=1)		35	42	38
N of Cond. Var. (=0)		80	73	77

Notes: All regressions are estimated based on weights (*pweights*) taken from an entropy balancing estimation (as described in the notes section of Table 2). In Panels A–B, control variables include *number of contracts*, *number of expired contracts*, *LN(SIZE)*, *LEV*, *CFO*, *PPE_TA*, *LN(FF)*, *LN(AF)*, *RU1000 index membership*, and *RU2000 index membership*. In Panel C, control variables include *number of contracts, number of expired contracts, LN(SIZE), LEV, LN(TQ), ROA, Sales Growth, CFO, PPE_TA, LN(FF), LN(AF), RU1000 index membership,* and *RU2000 index membership*. In Panel C, the dependent variable *CSR_VIOLATION* is an indicator variable equal to 1 for suppliers with at least one CSR-related violations in year t. All variables are defined in Appendix A. ***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively, using two-tailed tests and standard errors clustered at the industry level.

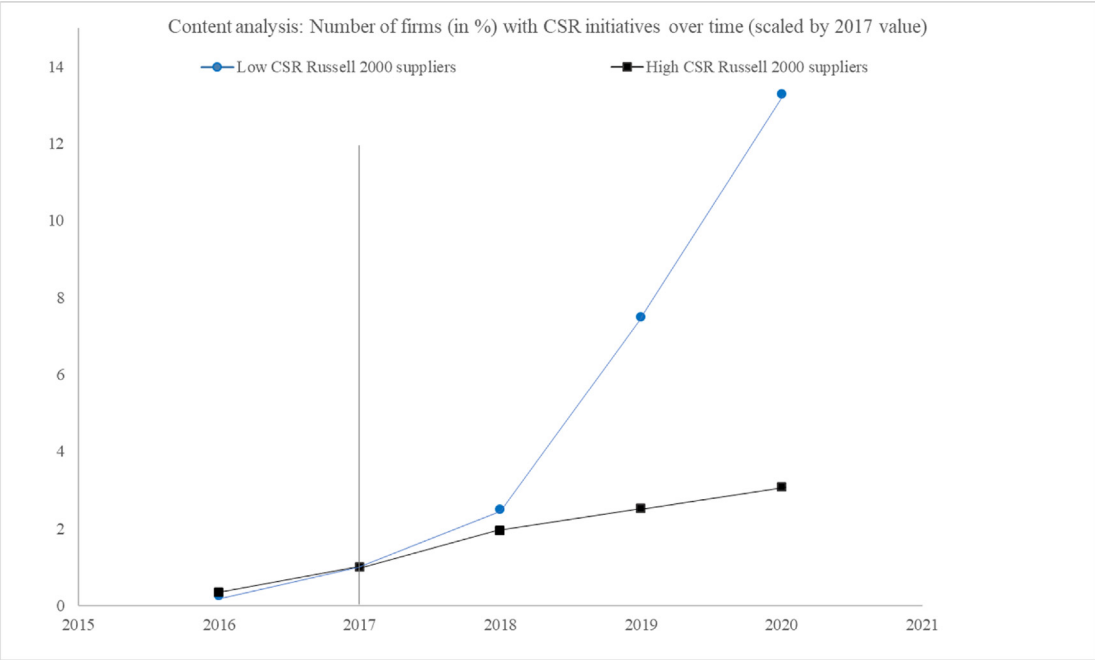


Fig. 3. Growth rate of new CSR initiatives. Notes: The growth rate of CSR initiatives is defined as the change in the number of CSR initiative firms (firms with at least one CSR initiative in the current year or the previous years) scaled by the number of firms in 2017. Online Appendix N provides information about the data generating process underlying our content analysis and provides information about the underlying sample.

6.1. Effects on suppliers' financial performance

To examine whether the reduced contracting also translates into discernible firm performance effects for the treated suppliers, we estimate our main difference-in-differences model (Eq. (1)) for two measures of suppliers' financial performance: sales growth and return on assets (ROA). Panel A of Table 6 shows that the average treatment effect is significantly negative for sales growth and is concentrated in low CSR suppliers. This finding is also economically meaningful, with a relative reduction in sales growth of around 16 percentage points. The results for ROA reported in Panel B are weaker. Although the coefficient estimates for low CSR suppliers are negative, the effect is significant only for suppliers with low levels of environmental CSR performance (Low ENV). Collectively, these results suggest that our main finding—low CSR suppliers experience a reduction in contracting due to the CSR information shock—translates into negative performance effects for these suppliers.

To explore the potential long-term performance consequences, we extend the post-treatment sample period by two years, i.e., from 2017 to 2018 (original post-period) to 2017–2020 (extended post-period). Panels A and B of Online Appendix M report firm performance effects for the extended balanced sample from 2014 to 2020 with 587 unique firms (as opposed to 702 unique firms in the main analyses). Results are similar to those based on the original sample period, with slightly weaker effects (in terms of economic magnitude) on revenue. For example, the reduction in sales growth for low CSR suppliers is around 10 percentage points, as compared to the 16 percentage points in Table 6. One potential explanation is that low CSR suppliers in the longer term respond "successfully" to the reduction in contracting, e.g., by increasing CSR (see also our analyses in the next Section 6.2). We caution, however, that our extended post period might be affected by the Covid-19 crisis.

6.2. Effects on suppliers' nonfinancial (CSR) performance

Affected low CSR suppliers may respond to the CSR information shock and the ensuing reduction in contracting by increasing their CSR performance. Consistent with this argument, the literature on the real effects of mandatory CSR disclosures shows that firms respond to actual or anticipated stakeholder reactions by increasing their CSR activities (e.g., Christensen et al., 2017; Chen et al., 2018; Fiechter et al., 2022). We therefore investigate whether suppliers respond to the CSR information shock and its consequences by increasing CSR performance. To proxy for CSR performance, we use data from the Violation Tracker database. This database, which is compiled by the nonprofit organization Good Jobs First, provides a comprehensive coverage of violations of federal laws written by US Federal Agencies (e.g., workplace safety, wage-and-hour rules, or environmental and consumer protection).[24] If our treated

[24] For further information about the Violation Tracker data, see, e.g., Heese et al. (2022), Li and Raghunandan (2021), and Raghunandan (2021).

suppliers increase their CSR performance after the CSR information shock, we would expect a reduction in violations of federal laws.

Table 6 Panel C reports the results from estimating our main model (Eq. (1)) using *CSR_VIOLATION* as outcome variable. *CSR_VIOLATION* is an indicator variable that equals 1 for suppliers with at least one compliance violation in year t.[25] To ensure that firms without violations are "true zeros" rather than firms not covered by the Violation Tracker, we estimate the regressions on a subsample with treated and control firms having at least one violation incident during our sample period.[26] The corresponding results in columns (2) to (4) suggest a significant decrease in violations for low CSR suppliers, indicating improvements in CSR performance. However, when we use the complete balanced sample, our results (untabulated) become marginally insignificant (e.g., t-stats range between −1.08 and −1.36).

To derive a complementary measure of firms' CSR performance, we use content analyses of firm disclosures about CSR initiatives. We use CSR initiatives, as this construct closely maps into the concept of firms' real actions (Leuz and Wysocki, 2016, p. 545). Specifically, we hand-collect data on whether (and when) firms launch new CSR-related initiatives during the period 2016 to 2020. We obtain data on CSR initiatives from company reports and company websites at different dates between 2016 and 2020 by using the Wayback Machine.[27] Firms that initiated at least one new CSR-related activity are categorized as "CSR initiative firms."[28]

Fig. 3 summarizes findings from our content analysis, showing the growth rates of new CSR initiatives for high and low CSR suppliers over the years 2016–2020 (see online Appendix N for the underlying data used to calculate these growth rates).[29] The graph for high CSR firms indicates a steadily increasing growth rate of new CSR initiatives over time. In comparison, for low CSR firms, we observe a stark increase in the growth rate of CSR initiatives after 2018. The observation that low CSR firms launch initiatives mainly in 2019 and 2020 aligns with the interpretation that low CSR suppliers improve their CSR performance following the CSR information shock and ensuing reductions in contracting. We caution, however, that our content analysis provides descriptive evidence only, focuses solely on one dimension of firms' CSR activities (i.e., new CSR initiatives), and critically hinges on the credibility of the information provided by the firms.

7. Conclusion

This paper exploits a CSR information shock to examine the role of CSR information in stakeholder decision-making, specifically supply-chain contracting decisions. Our findings demonstrate that corporate customers respond to the 2017 rating coverage expansion by Thomson Reuters Asset4 from Russell 1000 to Russell 2000 firms by reducing contracting with low CSR Russell 2000 suppliers. We propose that these reactions by corporate customers are consistent with two mechanisms: CSR-related benchmarking and public pressure. Our empirical findings are consistent with these proposed explanations, as our main effects are concentrated in customer-supplier pairs with high (pre-shock) information asymmetry and in customer-supplier pairs subject to high visibility.

Our findings have several implications. As we are among the first to provide evidence on the causal effect of CSR information on non-investor stakeholder decision-making, our findings have implications for policymakers and regulators considering increased CSR transparency as a policy tool to increase firms' CSR orientation (e.g., Directive 2014/95, recital 3 of the European Union). A key assumption of these policy initiatives is that stakeholders act on increased CSR information. Our study provides evidence of stakeholder decision-making. We caution, however, that our study does not in detail investigate the impact of these stakeholder decisions on CSR outcomes, e.g., net improvements in CSR along supply chains. Affected suppliers may react to customer pressure in various ways, including ramping up of CSR (we provide some evidence on that in our additional analyses) or avoiding CSR rating coverage by strategies such as delisting. Relatedly, due to data restrictions, we cannot trace where customers direct the contracting volume they reduce with low CSR suppliers. For example, customers

[25] Our inferences remain the same when we use the log of the number of violations per firm-year and the log of the US dollar amount of penalties for violations per firm-year, respectively, as dependent variables. In addition, similar to the financial performance tests, we also run tests using an extended post-treatment period (2017–2020). Results in Online Appendix M, Panel C, are largely consistent with those tabulated in Table 7, suggesting a reduction in violations.

[26] Due to this rather conservative approach, the Violation Tracker tests are based on a substantially reduced subsample of firms; for example, the number of unique firms in the low CSR treatment group ranges between 35 and 42, as compared to the 166 unique low CSR suppliers in the main analyses.

[27] We find very little CSR-related information in company filings, and thus we focus mainly on company reports and webpages as information source. However, even when using the Wayback Machine, information beyond (for) the year 2016 is nearly impossible (very difficult) to obtain. Therefore the year 2016, i.e., the year before the CSR information shock, is the first sample year for these descriptive analyses, and the 2016 results should be interpreted with particular caution.

[28] Online Appendix N provides a detailed description of the data collection process and the classification of firms. What follows are three examples of firms that we classified as CSR initiative firms. (i) "In fiscal 2019, Extreme installed a 2.2-MW Bloom Energy Fuel Cell System to generate power at its San Jose headquarters to operate as a utility microgrid. The fuel cell technology reduces carbon dioxide emissions and nearly eliminates the water required to produce energy" (Extreme Networks, Inc., 2019). (ii) "In 2019, we began installation of solar panels on our Acton, MA manufacturing facility to help reduce our energy costs and carbon footprint. In 2019, we launched a mentoring initiative, which paired high potential employees with a senior leader mentor. Additionally, we launched Employee Resource Groups, a program designed to support various diversity and inclusion efforts in the organization" (Insulet Corp., 2019). (iii) "Through our Integrated Talent Management System, launched in 2018, monthly 'Learning Playlists' are comprised of videos or podcasts on topics ranging from LGBTQ issues and emotional intelligence to tools and tactics for having difficult conversations" (Pattern Energy Group Inc., 2018).

[29] The growth rate of CSR initiatives is defined as the change in the number of CSR initiative firms (firms with at least one CSR initiative in the current year or the previous years) scaled by the number of firms in 2017.

may direct their contracting volume to high CSR suppliers, contract with less visible (e.g., nonlisted) suppliers with low CSR, or break up the business between two or more suppliers so that neither supplier needs to be disclosed as material to the customer.[30] We leave it to future research to explore these issues and improve our understanding of the economic implications of increased CSR information.

Our findings also enhance our understanding of the (CSR) management of global supply chains. Specifically, our evidence suggests that the diffusion of socially responsible behavior from corporate customers to their suppliers (Dai et al., 2021) represents but one out of various policies that corporate customers adopt to keep their supply-chain green. We document another such policy: deliberate reduction of contracting with low CSR quality suppliers. Finally, our findings inform the discussion about the role of CSR ratings vendors and their ratings. Our study differs from previous research (e.g., Chatterji et al., 2016; Christensen et al., 2022) by exploiting a coverage perspective and providing evidence that third-party CSR rating information facilitates comparability and visibility of CSR information.

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Appendix A

Definition of variables

Panel A. Key variables used in our study

Variable	Description	Data source
Difference-in-differences variables		
POST	Dummy variable indicating years≥2017	Worldscope
TREAT	Dummy variable indicating Russell 2000 firms as of Dec. 2016	Capital IQ
Factset supply chain		
Number of new contracts	Number of newly initiated contracts with corporate customers per supplier and year.	Factset Revere
Number of customers	Based on *Number of new contracts* and counts the number of unique corporate customers per supplier and year.	Factset Revere
Number of expired contracts	Number of expired contracts with corporate customers per supplier and year	Factset Revere
Percentage of contracts disclosed by customers	Contracts disclosed by customers as a percentage of all contracts for the supplier-year in the database	Factset Revere
Asset4 CSR Scores		
CSR score	Average environmental and social score ((socscore + envscore)/2) as of 2017	ASSET4
ENV score	Environmental Score (envscore) as of 2017	ASSET4
SOC score	Social Score (socscore) as of 2017	ASSET4
Firm characteristics		
*LN(SIZE)**	Log of fiscal year's total assets (wc02999)	Worldscope
*LEV**	Total debt (wc03255) to total assets (wc02999)	Worldscope
*LN(TQ)**	Log of yearly average market value (dwta+(mv*1000) - dwse) scaled by yearly average total assets (dwta)	Worldscope
*ROA**	Net income available to common shareholder (wc01751) deflated by total assets (wc02999)	Worldscope
*GROWTH**	Changes in revenues (wc01001)	Worldscope

[30] Our synthetic control group findings lend some (graphical) support for the interpretation that some of the contracts are redirected to low CSR Russell 1000 firms whose CSR quality is high relative to the newly revealed CSR quality of Russell 2000 suppliers.

[31] Consumer goods: 0000–0999, 2000–2399, 2500–2599, 2700–2799, 2830–2869, 3000–3219, 3420–3429, 3523, 3600–3669, 3700–3719, 3751, 3850–3879, 3880–3999, 4813, 4830–4899, 5000–5079, 5090–5099, 5130–5159, 5220 5999, 7000–7299, 7400–9999; Finance: 6000–6999 (see Lev et al., 2010, p. 188; Flammer, 2018).

[32] This variable is only available for around 40% of the underlying contracts in Factset. If this variable is not available, we assume that the supplier is not more important for the customer than vice versa.

*CFO**	Cash from operations (wc04860) to total assets (wc02999)	Worldscope
DIV	Dummy variable indicating positive dividend (wc05101)	Worldscope
*PPE_TA**	Property, plant & equipment (wc02501) divided by total assets (wc02999)	Worldscope
*LN(FF)**	Log of percentage of shares in free float (noshff)	Worldscope
*LN(AF)**	Log of number financial analyst following a firm (rec)	I/B/E/S
CSR reporting	Indicates whether CSR report is published (cgvsdp026)	ASSET4
Financial Constraint Index	The index is based on Whited and Wu (2006). WW Index = ((-0.091)* ((wc01551+wc04049)/wc02999)) - (0.062*DIV) + (0.021 * (wc03255/wc02999)) - (0.044 * (log(wc02999))) + (0.102 * GrowthInd) - (0.035 * GROWTH). With GrowthInd = mean GROWTH by FFI48 and year.	Worldscope
CSR_VIOLATION	Indicator that equals 1 if firm i had at least one violation (regardless of the penalizing agency or fine amount) in year t.	Violation Tracker
RU2000	Dummy variable indicating Russell 2000 index membership	Capital IQ
RU1000	Dummy variable indicating Russell 1000 index membership	Capital IQ

Panel B. Factset supply chain: Types of contracts

Variable	Description	Data source
Information asymmetry and benchmarking		
Supplier in different (same) industry as customer	Industries are identified via Factset's "primary_sic_code" variable. Industry match is measured at a four-digit sic industry level.	Factset Revere
Supplier with short-term (long-term) business relations	Short-term (vs. long-term) business relations are based on pre-treatment period contracting duration. Suppliers with short-term (long-term) business relations have below (above) average contract durations in the pre-treatment period.	Factset Revere
Supplier and customer with low (high) contracting intensity	Contracting intensity is based on the number of contracts per supply-customer pair and year. Suppliers with low (high) contracting intensity have below (above) average numbers of contracts with their customer for a given year.	Factset Revere
HIGH_INFO_ ASYMMETRY	Average number (of contracts or customers) based on the following contract characteristics: (i) supplier is in different industry as customer, (ii) supplier with short-term business relation, and (iii) supplier-customer with low contracting intensity.	Self-constructed based on Factset Revere
LOW_INFO_ ASYMMETRY	Average number (of contracts or customers) based on the following contract characteristics: (i) supplier is in same industry as customer, (ii) supplier with long-term business relation, and (iii) supplier-customer with high contracting intensity.	Self-constructed based on Factset Revere
Visibility and public pressure		
Supplier contracts with listed (private) customer	Listed customers are identified via Factset's "entity_type" variable (listed="PUB"; non-listed otherwise).	Factset Revere
Supplier contracts with customer from B2C (B2B) industry	Industries are identified via Factset's "primary_sic_code" variable. B2C industries include consumer goods industries and finance.[31]	Factset Revere
HIGH_VISIBILITY	Average number (of contracts or customers) based on the following contract characteristics: (i) customer is listed and (ii) customer operates in B2C industry.	Self-constructed based on Factset Revere
LOW_VISIBILITY	Average number (of contracts or customers) based on the following contract characteristics: (i) customer is not listed and (ii) customer operates in B2B industry.	Self-constructed based on Factset Revere
Economic importance of supplier for customer		
Supply-chain relation disclosed by customer (supplier)	Based on Factset's "source_factset_entity_id" variable. This variable reveals whether the supply-chain link is disclosed by the corporate customer or the supplier.	Factset Revere
Less (more) industry competition among suppliers than customers	Market share of customers (suppliers) to proxy for industry competition is identified via Herfindahl-Hirschman Index (HHI). HHI is based on four-digit sic	Factset Revere

	industry groups-years and includes the number of the customer's (supplier's) new contracts relative to the overall number of contracts in its industry. Contracts with less industry competition among suppliers than customers are linked to suppliers that have a higher HHI values than their customers.	
Supplier is important for customer (or vice versa*)*	Supplier's importance is identified via Factset's "supplier_ranking" and "customer_ranking" variables. Supplier importance is defined as "supplier_ranking" is larger than "customer_ranking" (i.e., supplier is more important for customer than vice versa).[32]	Factset Revere
HIGH_ECON_IMPORT	Average number (of contracts or customers) based on the following contract characteristics: (i) supply-chain link is disclosed by customer, (ii) more industry competition among customers than suppliers, and (iii) supplier is important for customer.	Self-constructed based on Factset Revere
LOW_ECON_IMPORT	Average number (of contracts or customers) based on the following contract characteristics: (i) supply-chain link is disclosed by supplier, (ii) more industry competition among suppliers than customers, and (iii) customer is important for supplier.	Self-constructed based on Factset Revere

Notes: * Winsorized at 1% level.

Appendix B

Description of ASSET4's CSR data[33]

Panel A. Overview

Since its foundation in 2003 and its subsequent acquisition by Thomson Reuters in 2009, ASSET4 compiles data on firms' environmental, social, and governance (ESG) activities. Data sources commonly include (a) company reports, (b) company filings, (c), company websites, (d) NGO websites, (e) CSR reports, and (f) selected media outlets. More than 120 ASSET4 research analysts covered more than 4,600 firms worldwide and collected ESG data on more than 500 separate data items. These data items translated into 226 Key Performance Indicators (KPIs).

Panel B. Environmental score

ASSET4's *environmental* score is based on 70 KPIs and comprises factors such as resource usage and reduction, emissions, environmental activism, and environmental-related product or process innovation.

Component	*KPIs*
Emission reduction (with 28 KPIs)	Policy, Implementation, Monitoring, Improvements, Biodiversity Impact, Biodiversity Controversies, Greenhouse Gas Emissions, Cement CO2 Emissions, CO2 Reduction, F-Gases Emissions, Ozone-Depleting Substances Reduction, NOx and SOx Emissions Reduction, VOC Emissions Reduction, Waste, Waste Recycling Ratio, Hazardous Waste, Discharge into Water System, Waste Reduction, Innovative Production, Environmental Partnerships, Environmental Management Systems, Environmental Restoration Initiatives, Transportation Impact Reduction, Spills and Pollution Controversies, Spill Impact Reduction, Climate Change Risks and Opportunities, Environmental Compliance, Environmental Expenditures
Product innovation (with 25 KPIs)	Policy, Implementation, Monitoring, Improvements, Environmental Products, Energy Footprint Reduction, Environmental R&D Expenditures, Environmental R&D, Noise Reduction, Hybrid Vehicles, Renewable/Clean Energy Products, Water Technologies, Environmental Asset Management, Environmental Project Financing, Renewable Energy Supply, Liquefied Natural Gas, Eco-Design Products, Labelled Wood Percentage, Organic Products, Product Impact Minimization, GMO Free Products, Sustainable Building Products, Animal Testing, Environmental Labels and Awards, Product Impact Controversies
Resource reduction (with 17 KPIs)	Policy, Implementation, Monitoring, Improvements, Materials, Materials Recycled and Reused Ratio, Toxic Chemicals, Energy Use, Cement Energy Use, Renewable Energy Use, Green Buildings, Energy Efficiency Initiatives, Water Use, Water Recycling, Environmental Supply Chain Management, Land Use, Environmental Resource Impact Controversies

Panel C. Social score

ASSET4's social score relies on 88 KPIs and covers factors such as employment quality, health and safety issues, human rights, community involvement, and product responsibility.

Component	*KPIs*
Product Responsibility (with 19 KPIs)	Policy, Implementation, Monitoring, Improvements, Quality Management, Product Access, Technology Know-How Sharing, Social Labels, Sustainable Consumption, Clinical Trials and Research Guidelines, Retailing Responsibility, Social

[33] Based on the 2013 Thomson Reuters/ASSET4 CSR Rating and Ranking/Rules and Methodologies documentation (https://financial.thomsonreuters.com/content/dam/openweb/documents/pdf/tr-com-financial/methodology/corporate-responsibility-ratings.pdf) (last accessed: October 24, 2017).

	Exclusion Controversies, Responsible Marketing Controversies, Responsible Asset Management, Customer Controversies, Product Compliance, FDA Warning Letters, Drug Delay, Product Recalls/Withdrawals
Community (with 15 KPIs)	Policy, Implementation, Monitoring, Improvements, Total Donations, Donations in General, Income Taxes, Corporate Responsibility Awards, Diseases of the Developing World, Critical Countries - Indigenous People Controversies, Patent Infringement, Crisis Management, Public Health Controversies, Bribery/Corruption and Fraud Controversies, Business Ethics Compliance
Human Rights (with 8 KPIs)	Policy, Implementation, Monitoring, Improvements, Suppliers Social Impact, Freedom of Association Controversies, Child Labour Controversies, Human Rights Controversies
Diversity/Opportunity (with 10 KPIs)	Policy, Implementation, Monitoring, Improvements, Managers Female Male Ratio, Management Equal Opportunity, Work-Life Balance, Family Friendly, Diversity Controversies, Diversity Compliance
Employment Quality (with 17 KPIs)	Policy, Implementation, Monitoring, Improvements, Salaries, Salaries Distribution, Bonus Plan, Generous Fringe Benefits, Employment Awards, Salary Gap, Trade Union Representation, Net Employment Creation, Personnel Turnover, Announced Lay-offs, Key Management Departures, Strikes, Wages or Working Condition Controversies
Health and Safety (with 9 KPIs)	Policy, Implementation, Monitoring, Improvements, Injuries, Lost Days, HIV-AIDS Programme, Health & Safety Controversies, Health & Safety Compliance
Training/Development (with 10 KPIs)	Policy, Implementation, Monitoring, Improvements, Training Hours, Training Costs, Internal Promotion, Management Training, University Partnerships, Supplier ESG Training

Appendix C. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jacceco.2022.101525.

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