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Socially Responsible Corporate Customers

Finance Working Paper N° 560/2018
Revised July 2019

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This paper can be downloaded without charge from:
https://doi.org/10.67929/ecgi-fin-560-2018

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ECGI Working Paper Series in Finance

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We thank Ekkehart Boehmer, Richard Carney, Simba Chang, Zhenhui Chen, Tao Chen, Travers Child, Lauren Cohen, Hyunsoo Doh, Itamar Drechsler, Ying Duan, Caroline Flammer, Aurobindo Ghosh, Sadok El Ghoul, Xavier Giroud, Olga Hawn, Jie (Jack) He, Johan Hombert, Dashan Huang, Chuan Yang Hwang, Oguzhan Karakas, Andy Kim, Lloyd Kurtz, Mauricio Larrain, Long (Jason) Li, Jun Li, Weikai Li, Karl Lins, Roger Loh, Christopher Marquis, Ron Masulis, Roni Michaely, Clemens Otto, Hoonsuk Park, Hyeong-sop Shim, Victor Song, Choi Hyun Soo, Laura Starks, Neal Stoughton, Alexander Verdarushko, Cong Wang, Heli Wang, Chishen Wei, Qiping Xu, Frank Yu, Xiaoyun Yu, Bohui Zhang, Chendi Zhang, and seminar participants at the China Europe International Business School, China International Conference in Finance (CICF), City University of Hong Kong, Darla Moore School of Business-Hitotsubashi University Third International Conference on Corporate Finance, Deakin University, Massey University (Albany campus and Palmerston North campus), Monash University, Nanyang Technological University, the Schulich School of Business, Singapore Management University, Simon Fraser University, Sungykunkwan University, Telfer Annual Conference on Accounting and Finance at the University of Ottawa, and WRDS of The Wharton School, for their many helpful comments and suggestions.

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Abstract

Corporate customers are an important stakeholder in global supply chains. We employ several unique international databases to test whether socially responsible corporate customers can infuse similar socially responsible business behavior in suppliers. Our findings suggest a unilateral effect on CSR only from customers to suppliers, an evidence further supported by exogenous variation in customers' close-call CSR proposals and by product scandals. Customers exert influence on suppliers' CSR through positive assortative matching and their decision making process. Enhanced collaborative CSR efforts help improve operational efficiency and firm valuation of both customers and suppliers but increase only the customers' future sales growth.

Keywords: Corporate Social Responsibility, Corporate Customers, Global Supply Chains, Economic Benefits

JEL Classifications: G23, G30, G34, M14

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Current Version: July 2, 2019

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Abstract

Corporate customers are an important stakeholder in global supply chains. We employ several unique international databases to test whether socially responsible corporate customers can infuse similar socially responsible business behavior in suppliers. Our findings suggest a unilateral effect on CSR only from customers to suppliers, an evidence further supported by exogenous variation in customers' close-call CSR proposals and by product scandals. Customers exert influence on suppliers' CSR through positive assortative matching and their decision making process. Enhanced collaborative CSR efforts help improve operational efficiency and firm valuation of both customers and suppliers but increase only the customers' future sales growth.

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More than 1,000 of the world's largest companies ... have emissions-reduction targets for their own operations. Now, they want the thousands of companies that supply them with goods and services to reduce their own emissions.[1]

1. Introduction

Today's changing global businesses and corporate environments have brought about a new wave of corporate social responsibility (CSR) activities that go beyond the regulatory requirement of the country (Bénabou and Tirole, 2010; Kitzmueller and Shimshack, 2012). As corporations face increasing societal demands for more CSR activities,[2] there appear growing corporate efforts to integrate social, environmental and ethical concerns into their business operations. Anecdotal evidence, as well as the opening quote, has suggested that many corporate customers are concerned not only with their own CSR standards but also with those of their suppliers. Some scholars argue that the growing popularity of CSR activities around the world is, in part, in response to the repeated failures of laws and regulations protecting stakeholders, raising the need from stakeholders to protect their own interests through pushing the company to engage in CSR (Bénabou and Tirole, 2010; de Bettignies and Robinson, 2017). However, it is not apparent whether corporate customers, one of the most important stakeholders, are really taking actions to push suppliers to engage in socially responsible business practices, or whether their public mention of CSR commitment is simply a sideshow (see, e.g., Koehn and Ueng, 2010; Kitzmueller and Shimshack, 2012). Nevertheless, there is limited academic research on the role of corporate customers in influencing suppliers to conduct their business operations in a socially and environmentally responsible manner. Thus, the goal of our study is to explore whether and by which mechanisms corporate customers drive CSR practices in global supply chains around the world, and consequently, their economic implications for both customers and suppliers.

Increases in economic globalization, advancements in production and information technologies, and improvement in logistics have facilitated a dynamic growth in global supply chains. As corpo-

[1] https://www.greenbiz.com/article/how-get-suppliers-act-climate

[2] As of 2017, more than 9,500 corporations from 160 developed and developing countries have become participants of the United Nations Global Compact program, a global initiative to encourage "companies to align strategies and operations with universal principles on human rights, labour, environment and anti-corruption, and take actions that advance societal goals." https://www.unglobalcompact.org/what-is-gc/participants.

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rations exploit these expanding opportunities, they face new challenges to properly enforce their own CSR policies across their global and complex supplier networks. Investing in CSR initiatives can be especially costly for corporations grappling with the difficulties posed by managing a global supply chain, but there are various arguments for why these firms would want their suppliers to implement such initiatives. For example, corporations may push suppliers to engage in CSR activities as a means of window dressing to appease various stakeholder groups and avoid negative publicity, may help recruit, motivate, and retain employees,[3] may attract new customers and increase market share,[4] may improve the firms' image in the investment community and thereby their ability to access capital,[5] among others. Also, research by practitioners has shown that environmental and social scandals associated with suppliers increase not only the suppliers' own reputation risk index but also their customers' and that such increases in reputation risks are accompanied by falling stock prices subsequent to the release of corporate scandals.[6] Therefore, we hypothesize that customers are compelled to exert influence on suppliers for better CSR practices and that their actions have real economic consequences.

We exploit several unique international databases to test whether socially responsible corporate customers can infuse similar socially conscious business behavior in suppliers. The two primary international databases are: (1) a newly available FactSet Revere database that provides information on firm-level networks of customers and suppliers around the world, and (2) Thomson Reuter's ASSET4 Environmental (E), Social (S), and Corporate Governance (G) database (ASSET4) that contains ASSET4 ratings (i.e., a composite firm-level CSR rating) as well as more than 750 constituent ESG ratings of global publicly listed firms. After merging these two databases, our sample consists of 34,117 unique corporate customer-supplier pairs from 50 countries worldwide for the period from 2003 to 2015. Using this large international sample of corporate customer-supplier

[3]For example, Deloitte Touche Tohmatsu provides its young managers the opportunity to participate in yearlong education programs dedicated to improving their skills and abilities. The company believes "the effort should help recruit top candidates ... and increase retention rates of high-potential employees." See "Deloitte focuses on ethics," by Alina Dizik, *Wall Street Journal*, November 19 2009.

[4]For example, to court younger consumers and to reinvent their image, Louis Vuitton buys stake in organic clothing maker and has been developing eco-friendly products and supporting environmental causes. See "Luxury-goods makers brandish green credentials" by Rachel Dodes and Sam Schechner, *The Wall Street Journal*, July 2 2009.

[5]There is an increasing number of institutional investors who now factor CSR criteria into their selection processes to include socially responsible companies (Starks, Venkat, and Zhu, 2018).

[6]https://www.reprisk.com/publications.

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relationships, we find evidence of a significant unilateral effect of customers' socially responsible behavior on their suppliers', suggesting that corporate customers make real efforts to ensure suppliers engage in similar CSR standards. Suppliers, however, exhibit no influence on customers' CSR activities. In terms of economic significance, a one standard-deviation-change in the customer CSR rating will generate about an 8% aggregate increase in future CSR performance of suppliers through the customer's direct network. These results are robust to the inclusion of a multitude of firm-level control variables, the log of a country's gross domestic product per capita (ln(GDPC)), as well as different combinations of fixed effects. In addition, we find that locations of customers and suppliers matter for the working of CSR in supply chains. Customers play a crucial role in improving CSR standards at their suppliers when their countries have similar standards of CSR. Finally, our key finding is robust to using (i) differential CSR measures between customers and suppliers, (ii) alternative CSR databases (i.e., MSCI Intangible Value Assessment and Sustainalytics), (iii) social and environmental aspects of CSR, and (iv) falsification tests.

Our finding of strong correlations between customer CSR and subsequent improvement in supplier CSR might not reflect a causal relation since customers' CSR practices might be correlated with their selective preference toward suppliers who are more likely to cooperate and commit to higher CSR standards. Thus, it is apparent that identifying the impact of customers on supplier CSR performance can be empirically challenging. One may tackle this identification issue by investigating the effect of an initial implementation of a country-level ESG regulation on CSR propagation along the supply chain. But such regulatory ESG mandates often have different implications from those arising from voluntary CSR engagements. As a consequence, any mandatory response taken by customers that in turn impacts suppliers may not necessarily suggest voluntary CSR actions made by customers beyond the regulation. To circumvent this identification problem, we examine the unilateral effect of customers on supplier CSR by using a regression discontinuity design (RDD) that relies on exogenous variation generated by voting outcomes of customers' shareholder-sponsored CSR proposals that pass or fail by a small margin of votes (around the actual majority hurdle). The passage of these close-call proposals is similar to a random assignment of CSR to firms and hence should not influence the supplier's future CSR performance. Conceptually, there should be no systematic differences between suppliers whose customers pass and those whose customers

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fail a CSR proposal by a small margin of the votes. Therefore, close-call CSR proposals provide a source of random variation of a corporate customer's commitment to CSR that can be used to estimate the causal effect on its supplier's CSR practices.[7] Our results suggest that the passage of a customer's close-call CSR proposal is followed by the adoption of similar CSR practices by its supplier. The latter's CSR score in the following year is significantly higher (i.e., 24% of the standard deviation of CSR score) than the supplier's in which the vote fails by a small margin.

In another identification strategy, we employ exogenous shocks related to unexpected product safety scandals that have created global shocks to consumerism and the general public,[8] and find stronger customers' influence on supplier CSR following these unexpected global shocks. Since our analysis looks at the same customer-supplier pair before and after the shocks associated with the scandals, the positive CSR effect should be attributed to the customer's immediate push for suppliers to improve their socially responsible behavior in response to the scandal. In terms of economic significance, a one-standard-deviation increase in the customer's product responsibility rating in the scandal year will generate a 9.0%-10.9% rise in the supplier's mean product responsibility rating. An additional test also suggests that such scandals result in an increase in the supplier's reputation risk index and ultimately leads to a rise in the customer's reputation risk index as well. Combined, these results stemming from the two identification strategies allay potential endogeneity concerns on the impact of corporate customers on the CSR performance of suppliers.

Our evidence suggests that a key mechanism by which customers exert influence is through a positive assortative matching of CSR attributes. Customers tend to establish relationships with suppliers that are likely to exhibit socially and environmentally responsible behavior. On the other hand, customers may terminate these relationships if suppliers are unable to meet the customers' CSR demands (e.g., Banerjee, Dasgupta, and Kim, 2015). If the assortative matching is the mechanism, a severance of the economic link does not imply a weakened CSR spillover effect, unless such terminations are exogenous. We test this mechanism on a sample of newly linked and delinked customer-supplier relationships. Additionally, we construct a sample of target customer

[7] Flammer (2015a) and Cuñat, Gine, and Guadalupe (2012) also adopt a similar approach to study the effects of the passage of CSR proposals and of corporate governance proposals on stock returns, respectively. Cao, Liang, and Zhan (2018) employ RDD to look at peer effects induced by product-market connections.

[8] Barrot and Sauvagnat (2016) find that natural disasters propagate in production networks. Customers of suppliers hit by firm-level shocks experience a 2-3% fall in sales growth following the event.

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and supplier firms that are acquired by corporations with no prior economic link with either the target customer or the target supplier. We consider such target firms a source of exogenous variation of the CSR effect. When a supplier or a customer is targeted (i.e., such firms are targeted not necessarily by their own choice) and successfully acquired by another firm which is not part of the supply chain, we expect the stakeholder effect of CSR to become weaker. The results are in line with our expectations.

Another mechanism is through stakeholder bargaining power and/or through suppliers' decision-making process. We argue that the bargaining power of a customer depends on its reliance of the relationship-specific investment (RSI) made by its supplier and the competition intensity of an industry. When the customer depends heavily on its supplier's RSI, it has less power to impose greater, typically costly, CSR commitment on the supplier. Prior literature suggests that customers from research-intensive industries tend to involve in specialized inputs that require their suppliers to make investments consistent with their own (e.g., Armour and Teece, 1980; Levy, 1985; Allen and Phillips, 2000; Dhaliwal, Shenoy, and Williams, 2016; Chu, Tian, and Wang, 2017). Following this strand of literature, we employ a supplier's level of R&D and number of patents registered as measures of RSI. Similarly, we expect a customer to be powerful when its industry is more concentrated, or when its supplier's industry is highly competitive. The results suggest that customers are less inclined to affect their supplier's CSR performance when the supplier is highly innovative, or when the supplier's Herfindahl-Hirschman index (HHI, a measure of industry competitiveness) is low, or when the customer's HHI is high.

The extent to which a customer can push a supplier for more environmental and social responsibilities may possibly depend on network connectedness. One strand of literature suggests that common ownership produces positive externalities as shareholders aim to maximize the value of firms in their portfolio as opposed to individual firm value.[9] Another strand documents that board network via interlocked directors are conduits for common behaviors across board-linked firms.[10] We therefore expect common investor and board networks in a customer-supplier pair facilitate CSR propagation. In other words, when an investor of a customer firm subsequently also holds

[9]For example, Freeman (2017) provides evidence that common institutional ownership strengthens customer-supplier links and have synergistic effects on the related firms.

[10]For example, Chiu, Teoh, and Tian (2013) find that earnings management spreads between firms that share common directors.

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a stake in a supplier firm, or a director from the customer's board thereafter also serves on the supplier's board, such connectness allows the customer to wield influence. Our overall evidence that customers successfully influence suppliers' decisions on better responsible business practices is consistent with this prediction.

Our findings, thus far, point to collaborative or cooperative CSR efforts along the supply chain, where suppliers are willing or are coerced to align their CSR standards with those of their customers. Such efforts perhaps reflect the fact that CSR decisions are not made in a vacuum but, rather, are made through an informed understanding of the benefits reaped and the costs incurred. We then proceed to examine the economic implications of these collaborative CSR efforts between customers and suppliers. Previous studies show value enhancements in corporations that implement CSR initiatives, such as issues related to human rights, the community, the environment, and the treatment of employees (e.g., Dowell, Hart, and Yeung, 2000; Gillan et al., 2010; Edmans, 2011; Krüger, 2015; Ferrell, Liang, and Renneboog, 2016). However, implementing these CSR initiatives is costly and has negative financial implications (e.g., greater cost structure and agency problems) for their corporations (Balotti and Hanks, 1999; Masulis and Reza, 2015). Unlike these studies that focus on corporations' own CSR activities and performances, our analyses look at the economic impact of collaborative CSR efforts of customers and suppliers through their alignment of CSR standards. The increase of collaborative efforts helps improve operational efficiency and firm valuation for both the customer and supplier but enhance only the customer's future sales growth.

Our research makes two significant contributions to the literature. First, our research examines the role of a specific group of stakeholders – corporate customers – in propagating CSR along global supply chains, and shows evidence of a strong unilateral influence on CSR from the customer to the supplier only. While this evidence is interesting on its own, our study further shows that there are economic benefits associated with an improved CSR along the supply chain. A contemporaneous study by Schiller (2018) investigates whether a global supply chain acts as a mechanism through which CSR spills over from customers to suppliers. But his study looks at changes in regulation only on ESG disclosures, whereas ours utilizes both quasi-randomized and quasi-natural experiments on real ESG actions to establish the impact of customers' voluntary rather than mandatory CSR practices on suppliers', and shows that shareholders' proposals, expected product safety scandals,

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industry structure, and network connectedness all play a crucial role in propagating CSR. Our analyses offer new insights on how CSR gets transmitted around the world.

Existing studies attribute CSR to a firm's strategic pursuit for superior financial performance (Flammer, 2015a), or a manifestation of agency problems (Masulis and Reza, 2015; Cheng, Hong, and Shue, 2016). Recently, researchers begin to investigate how a firm's surrounding environment, such as national institutions (Ioannou and Serafeim, 2012; Liang and Renneboog, 2017) and interactions with other firms (Flammer, 2015b; Cao, Liang, and Zhan, 2018), plays a role in CSR. However, little is known about how CSR is influenced by economically-linked stakeholders. Our focus on an important type of stakeholders, namely corporate customers, helps to reconcile some puzzles in the emerging CSR literature, especially why firms often engage in costly CSR activity. The fact that such activity is increasingly prevalent worldwide may be a result of forces by other market players, such as powerful customers. This is especially the case when societal demand for CSR becomes greater following numerous CSR-related scandals in recent years. Our findings not only enhance our understanding on what drives CSR but also, more generally, shed light on non-economic incentives and practices of modern corporations around the world.

Second, our research contributes to the understanding of how corporate policies and behavior spillover along global supply chains and the value implications of such spillovers. It also expands the supply chain literature, such as the spillover of corporate tax avoidance (Cen et al., 2017), innovation knowledge transfers (Chu, Tian, and Wang, 2017), and information diffusion along supply chains (Cen, Doidge, and Schiller, 2016; Cen, Hertzel, and Schiller, 2017). By focusing on international corporate customer-supplier relationships, our study joins this strand of literature and further demonstrates that some corporate behaviors, such as CSR, propagate uni-directionally across countries. These institutional and firm-level nuances are often overlooked in the extant literature.

2. Data and Summary Statistics

This study employs data from several different sources: (i) information on the global network of customer-supplier relationships from the FactSet Revere ('Revere') global supply chain data ob-

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tained through the Wharton Research Data Services (WRDS); (ii) information on firm-level CSR ratings provided by Thomson Reuters ASSET4 ESG (i.e., Environment, Social, and Governance) database, together with alternative ratings information from MSCI Intangible Value Assessment, and Sustainalytics; country-level CSR ratings are obtained from Vigeo Sustainability data; (iii) M&A information from SDC Platinum from Thomson Reuters; (iv) R&D and sales information for computing a firm's industry concentration intensity from Worldscope, and patent data from the European Patent Office's worldwide Patent Statistical Database (PATSTAT); (v) international ownership information from the FactSet Global Ownership data; (vi) records of interlocking directorates from BoardEx company-level networks data from WRDS, which covers over 550,000 interlocking individuals worldwide; (vii) voting data from Institutional Shareholders Services (ISS) Global and US Voting Outcomes databases; (viii) information on firm-level reputation risk index is available from RepRisk data; (ix) news records from Ravenpack, Factiva, and Lexi-Nexis Bulk API, and (x) control variables from Datastream Worldscope. The definitions of all key variables are depicted in Appendix Table A.3.

2.1. Global economic links

Revere offers a unique database of supply chain relationships that identifies companies' interrelationships and their comprehensive geographic revenue exposures, starting from April 2003. It covers about 23,400 global companies, whose information is culled from company regulatory filings, websites, and daily updates based on new filings, press releases, and corporate actions releases. Revere gathers information on corporate direct relationships disclosed by the reporting company and on indirect relationships not disclosed by the reporting company but by companies doing business with the reporting company. For example, their public sources of US firms include regulatory filings (e.g., 8-K, 10-Q, and 10-K), investor presentations, websites, and press releases. One advantage of Revere data is that they contain information of both major and minor private and publicly-listed customers, as well as their GVKEY identities for publicly-listed firms. To illustrate the information contained in the Revere database, Figure 1 shows a 2013 snapshot of BMW with some examples of its 87 suppliers from the U.S., the Euro markets, Canada, China, Japan, South Korea, Mexico, and other countries worldwide. For example, Alfa is BMW's supplier in Mexico; Hankook, Hyundai,

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and Mobis are its suppliers in South Korea; and Baosteel in China. Under Regulation SFAS Nos. 14 and 131, firms are required to disclose any major customer that represents at least 10% of the firms' total reported sales. Unlike Revere data, the Compustat segment data, which are commonly employed in existing studies, obtain information on supply chain relationships only from companies' annual 10-K filings and hence, contain a revenue distribution of firms' major customers. A critical limitation of Compustat segment data is that it provides only names of customers instead of permanent identifiers. This further reduces the data coverage and accuracy, especially among firms that have changed names or shared similar names with other firms. Furthermore, the information is biased toward US suppliers that are SEC filers.

We merge Revere data with other sources of data, mentioned above, and our final sample consists of 34,117 unique corporate customer-supplier pairs, with customers and suppliers from 50 different countries worldwide. Columns (1)-(2) of Appendix Tables A.1 and A.2 report the numbers of suppliers and customers by year and by country, respectively. The numbers of suppliers and customers are monotonically increasing over time from 1,427 and 1,410 in 2003 to 14,427 and 13,227 in 2015, reflecting the growing coverage of firms by Revere and the expanding network of supply chain relationships. By country, Morocco has the smallest number of suppliers with CSR ratings (i.e., 3), whereas the U.S. has the largest (i.e., 38,546). On the other hand, the number of customers covered in Revere is the smallest in Egypt and Kuwait (i.e., 2) but is the largest in the U.S. (i.e., 43,741).

2.2. Global CSR Ratings

Thomson Reuters's ASSET4 database provides ESG ratings of more than 6,000 publicly-listed companies worldwide and is employed in studies such as Ferrell, Liang, and Renneboog (2016), Dyck et al. (2018), Hsu, Liang, and Matos (2017), among others. The ASSET4 database starts in 2002, but a more extensive coverage of ESG ratings of firms whose stocks are index members of SMI, DAX, CAC 40, FTSE 100, S&P 500, and NASDAQ 100 is available beginning from 2003. As the database expands, it also includes index members of DJ STOXX MSCI World in 2008, S&P/TSX Composite in 2009, Russell 1000, MSCI Emerging Markets in 2011, Bovespa in 2012, S&P ASX 300 in 2013, S&P NZX 50 in 2016, and Russell 2000, IPC 35, IPSA 40, MERVAL, COLCAP,

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PERU General Index in 2017. The ratings consist of more than 750 environmental, social, and corporate governance data points, including all exclusion (ethical screening) criteria and all aspects of sustainability performance. Every data point goes through a multi-step verification process, including a series of data entry checks, automated quality rules, and historical comparisons. These data points reflect more than 280 key performance indicators and are rated as both a normalized score (0 to 100) and the actual computed value. Thomson Reuters employs the percentile score calculation methodology to compute their Environmental, Social, and Governance (ESG) scores,[11] and evaluates the environmental and social ratings of a firm relative to those of their peers in the same industry around the world and the firm's governance rating against the country's level.

For all companies, at least three years of historical information are available, and most companies have coverage for at least 10 years. It is worth mentioning that firms in the ASSET4 sample are rated based on both their ESG compliance (regulatory requirements) and ESG engagement (voluntary initiatives), and the effectiveness of their endeavor. Therefore, a firm's CSR rating or score reflects a comprehensive evaluation of how the firm engages in stakeholder issues and complies with regulations. Columns (3)-(4) of Appendix Tables A.1 and A.2 show average composite values of supplier CSR scores (CSR^S) and customer CSR scores (CSR^C), by year and by country, respectively. The annual average CSR^S score ranges from 52.69 in 2003 to 67.43 in 2011, and the annual average CSR^C score varies between 62.83 in 2003 and 75.25 in 2015. While these across-year statistics suggest that customers, on average, are socially more responsible than suppliers, there seems no sign of improved CSR ratings through time, despite the growing expansion of CSR practices implemented by corporations worldwide in this past decade. Hence, it is important to understand how the widely-employed ASSET4 ratings, as well as the alternative CSR databases, are constructed. These ratings are rescaled every year and that explains why there seems no improvement in CSR across time.

One concern is that rescaling of a firm's rating relative to the ratings of its peers in the same industry may possibly give rise to a mechanical adjustment of ESG ratings of firms, particularly those large firms that first enter the database. As Thomson Reuters adds more firms to the ASSET4 database through the years, this addition of corporations may shift the effect of ratings of all firms

[11] https://www.refinitiv.com/content/dam/gl/en/documents/methodology/esg-scores-methodology.pdf

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in the database. As smaller and more obscure firms enter the database, the large corporations that are already in the database will result having better scoring. While the addition of these new companies to an industry may, to some extent, have an impact on CSR ratings of firms, any adjustment in ratings depends on the company's and its peers' data transparency. There are some positive polarity data measures (i.e., policy emissions, biodiversity impact reduction, environmental products, among others) that will improve the score, but there are also some negative polarity data measures (i.e., self-reported environmental fines, GMO products, animal testing, among others) that will adversely affect the score. As a result, there is no overall systematic shift in the CSR effect.

In Table 1, we present a more detailed distribution of CSR^S and CSR^C, with their mean, median, standard deviation, minimum and maximum values, and their values at 25th and 75th percentiles. In addition, we also report ESG component scores, particularly pertaining to environmental (Env), Social (Soc), and product responsibility (Product) issues. It is evident that the mean and median of CSR and ESG component scores are consistently greater for customers than for suppliers, further confirming that suppliers tend to be socially less responsible, compared to customers.

For robustness, our study also employs two alternative firm-level ESG databases, namely MSCI ESG Research Intangible Value Assessment (IVA) and Sustainalytics' ESG Research & Ratings (Sustainalytics). Both databases provide research, ratings, and analysis of companies' risks and opportunities arising from ESG factors. IVA industry-adjusted weighted average scores are between 0 and 10 and Sustainalytics' are between 0 and 100. Both ratings gauge how well companies manage CSR issues that are related to their businesses and provide an assessment of firms' ability to mitigate risks and capitalize on opportunities. Similar to ASSET4, these two alternative ratings are also industry-adjusted. In a subsequent section, we show that our baseline evidence is robust to alternative CSR ratings.

In addition, our analysis assesses a country's CSR standard using Vigeo's country-level sovereign ESG scores and benchmarks based on 120 ESG risk and performance indicators in three domains: (1) environmental protection, (2) social protection and solidarity, and (3) rule of law and governance. Countries are graded on a scale of 1 to 100 on their commitment and performance in these indicators (e.g., ratification of the Kyoto convention, the Vienna convention, the Stockholm

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convention, CO2 emissions per head, Gini index, etc.).

2.3. Identification variables

When implementing our identification strategies, we use information of CSR-related proposals from the ISS voting database for both US and international firms, which also provides information on the threshold of passage, as some proposals are not necessarily passed by more than 50% of support. For example, they may only be considered as being passed if they receive supporting votes that are over 66.7% or 75% of the cumulative votes. Our analysis uses actual thresholds of passing instead of the conventional 50% threshold.

We also employ information on the firm-level reputation risk index constructed by RepRisk, the only provider that systematically analyzes adverse ESG and business conduct data that can have a reputation and financial impact on a firm. RepRisk's research captures and analyzes information from media, stakeholders, and other public sources external to a firm. Its approach assesses whether a firm's policies and processes are translating into actual performance. For example, a corporation may have a human rights policy, and RepRisk would check whether stakeholders and sources at the local level properly report about how this corporation is handling human rights issues.

2.4. Channel variables

We describe several proxies that we employ to explore a number of possible channels through which customers affect suppliers' CSR practices. (i) The supplier's relationship-specific investment is measured by its R&D and number of patents registered. A firm's R&D information is obtained from Datastream Worldscope, whereas patent information is available from PATSTAT, which contains information on patents awarded to companies, individuals, and other institutions. (ii) A firm's Herfindahl-Hirschman index (HHI) is employed to gauge the degree of industry competitiveness. (iii) Network connectedness in a customer-supplier relationship is measured by commonality in institutional ownership and directorates of both the supplier and customer. Common ownership holdings information is obtained from the FactSet global ownership database. FactSet gathers US institutional holdings from mandatory quarterly 13F filings with the Securities and Exchange

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Commission and holdings of non-US equities from sources such as national regulatory agencies or stock exchange announcements (e.g., the Regulatory News Service in the U.K.), local and offshore mutual funds, mutual fund industry directories (e.g., European Fund Industry Directory), and company proxies and annual reports. Our analysis employs the percentage of shares held in customer and supplier firms by common owners and number of common owners in a customer-supplier pair. Our interlocking directorates (and executives) records are obtained from BoardEx company-level networks data.

Summary statistics of these channel variables are shown in the second panel of Table 1. The statistics suggest that suppliers tend to invest more in R&D than their customer counterparts. The mean (median) ratio of R&D relative to total assets is 0.05 (0.03) for suppliers and 0.04 (0.02) for customers. While there are significantly fewer firm-year observations for the number of registered patents, suppliers have slightly larger R&D and number of registered patents than customers. These statistics may reflect suppliers' investment specific to the needs of their customers. The average percentage of shares held by common owners is 0.39% in a supplier and 0.31% in a customer, and the average number of common owners is 214.5. The mean number of common directors is 0.06 with the mean number of board positions held by common directors is 0.07.

2.5. Control Variables

Our analysis controls for firm-level covariates commonly employed in the existing literature, such as leverage, return on assets (ROA), Tobin's Q, log of total assets (ln(TAssets)), the percentage of shares held by institutional investors and closely held shares (Inst/Close Holdings), and sales growth (SalesGrowth). Given the cross-country variation of our data, we control for country-level log of GDP per capita (ln(GDPC)) obtained from World Bank Indicators. The distribution of these control variables is displayed in the bottom panel of Table 1. The descriptive statistics show that on average, suppliers have marginally lower ROA and total assets, but are associated with greater Tobin's Q, larger number of closely-held shares, higher sales growth, and larger ln(GDPC), compared with those of their customers.

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3. CSR and Customer-Supplier Relationships

In this section, we examine whether corporate customers affect social and environmental engagements at their economically linked firms – the suppliers. Specifically, we investigate the CSR effect along the supply chain and determine whether any evidence of such effects depends on the locations of the customer and the supplier. We also conduct a host of additional tests to ensure robustness of our baseline evidence.

3.1. Stakeholder ('Corporate Customer') effects of CSR

To examine whether corporate customers, as stakeholders, play a role in influencing suppliers' CSR practices, we estimate the following model.

$$\text{CSR}^S \text{ Score}(t+1) \quad = \quad a_0 + a_1 \text{CSR}^C \text{ Score}(t) + \sum_{k=1}^{K} b_k \boldsymbol{X_k}(t) + \mathbf{FE}(t) + \epsilon(t+1), \qquad (1)$$

where CSR^S Score$(t+1)$ denotes a supplier's CSR rating at year $t+1$, CSR^C Score(t) is its customer's CSR rating at year t. Our hypothesis predicts that the coefficient a_1 is positive, which would suggest that the higher the customer's CSR rating, the better is the supplier's subsequent CSR performance. Conversely, it is also likely that socially responsible suppliers may likewise want to deal with customers that engage in ethical business practices. In other words, suppliers can influence customers to meet their expectations of ethical and responsible behavior. To test the effect of suppliers on customers' CSR, we reverse the roles of CSR^S and CSR^C in (1).

Drawn from the existing literature,[12] our analyses also control for firm-specific characteristics or country characteristics, as represented by $\boldsymbol{X_k}(t)$, which include a firm's leverage (Leverage), return on assets (ROA), Tobin's Q, log of total assets (ln(TAssets)), percentage of shares held by institutional investors and closely-held shares (Inst/Close Holdings), sales growth (SalesGrowth), as well as a country's gross domestic product per capita (ln(GDPC)) that have previously found to affect CSR. All these variables are defined in Appendix Table A.3. Additionally, we incorporate different combinations of fixed effects **FE**, such as the customer-supplier firm fixed effect, customer-

[12] See the references in the Introduction section.

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supplier industry fixed effect, customer-supplier country fixed effect, and year fixed effect. We employ the random-effects GLS approach to estimate the different model specifications in the table and throughout the study.

Our results from estimating various specifications of (1) are shown in columns (1)-(4) of Table 2, with those for the supplier effect of CSR in columns (5)-(6). In column (1), we report our estimates of model (1) with all the above listed fixed effects incorporated, supplier and customer firm-specific characteristics, as well as ln(GDPC). In column (2), we remove the customer-supplier firm fixed effect. It is important to stress that the purpose of incorporating the customer-supplier firm fixed effect is to capture any time-invariant unobservable factor that might simultaneously affect both the customer and supplier ratings. However, as discussed earlier, given that the ratings are rescaled each year and are fairly stable through time, the effect of the time-invariant customer-supplier CSR relationship would be unidentifiable in the model with firm fixed effects incorporated. As seen in columns (1) and (2), the coefficient of CSR^C becomes statistically and economically stronger without the firm FE but with customer-supplier industry and country fixed effects in place; the estimate increases from 0.026 (column (1)) to 0.031 (column (2)). Thus, consistent with the study of Dyck et al. (2018), our subsequent analyses should only control for industry and country fixed effects.

In column (3), we exclude customer characteristics from the specification as these variables have virtually no robust effect on supplier CSR (see columns (1)-(2)). Comparing the estimates of columns (2) and (3) also suggests that customer-specific variables are unable to subsume the strong effects of the supplier's characteristics on its own future CSR. The coefficient of CSR^C Score (i.e., 0.04 with robust standard error of 0.007) maintains its strong and positive effect on future supplier CSR, implying that customers are able to push suppliers to commit to greater CSR standards. In terms of economic significance, a one standard-deviation increase in a customer's CSR^C Score will generate, on average, a 1.67% ($= 0.04 \times 26.51/63.74$) improvement in its suppliers' next-period performance value of CSR (relative to the mean supplier CSR rating). More importantly, given that for the entire sample period, the customers have, on average, 4.6 suppliers in their supply chain, the multiplier effect is 7.58% at the customer level. This economic magnitude of our CSR effect is within the range of CSR effects (2.1%–12.83%) reported in two related studies that employ

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the same ASSET4 database (Liang and Renneboog, 2017; Dyck et al., 2018). Specifically, Liang and Renneboog report the difference of 8.33% in the environmental score and of 12.83% in the social score between civil and common law countries. Dyck et al., on the other hand, show that a one standard-deviation change in institutional ownership is associated with a 4.5% increase in environmental performance score and a 2.1% increase in social performance.

In column (4), we expand our sample to include all customer-supplier links that have even less than two years of relationships, or that the timing of the links is unclearly reported in the database. The sample size increases from 37,540 to 54,968. With brief links established between the customer and supplier, it is less likely that the customer will have the ability to coerce its supplier to commit to higher CSR standards. The finding shows only a slightly weaker, while statistically significant, customer CSR effect on the supplier; the estimate of customer CSR^C Score is 0.038, compared to 0.040 when the customer and supplier have established at least two years of relationship. Nevertheless, to be conservative, our analyses in the subsequent sections shall report results based on a larger sample of customer-supplier links.[13]

Next, in columns (5)-(6), we switch the roles of CSR^S and CSR^C in model (1) and instead test the effect of supplier CSR on the future CSR performance of the customer. But we find no significant effect of supplier CSR on future customer CSR. Combined with the estimates shown in columns (1)-(4), these results suggest a strong unilateral influence on CSR from the customer to the supplier only. Suppliers do not have a similar influence on customers' CSR activities. With corporate customers being closer to end consumers in the supply chain, the finding of a significant unilateral CSR influence from the customer to the supplier is not surprising. It is consistent with recent various food and safety scandals that show the dangers of not maintaining quality throughout the supply chain and how corporate customers manage reputation crisis by ensuring that suppliers commit to high social and ethical standards. For instance, the 2008 melamine scandal in China demonstrates how suppliers tainted milk to mitigate rising costs, and the scandal severely destroyed China's dairy industry. To rebuild consumer confidence and to restore their reputation, it is corporate customers and not suppliers that have placed new importance on product safety and

[13]Similar to the results of Table 2, the estimate of customer CSR^C Score for the remaining tables is larger in magnitude when we require that the customer-supplier link exists for at least two years. The results are available upon request.

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on accountability and ethical management in the supply chain.

However, our baseline results are also consistent with the notion that customers with weak CSR standards can lead to lower supplier CSR practices. To rule out this alternative explanation, in column (7), we test the customer effect of CSR on the change of supplier CSR. Similarly, in column (8), we also assess the supplier effect of CSR on the change of customer CSR. The coefficient of CSR^C is positive and statistically significant, whereas that of CSR^S is negative and insignificant. These findings further corroborate our baseline evidence of a unilateral CSR effect from the customer to the supplier and that the customers exhibit a positive influence on the supplier's CSR standards.

In summary, we find that, in aggregate, corporate customers, as a group of influential stakeholders, play an important role in improving CSR performance of suppliers across the world. This evidence also reflects customer activism as a disciplining mechanism in suppliers' corporate social responsible behavior.

3.2. Locations of customers and suppliers

Local institutional environments, such as socio-economic, political, and cultural factors, play an important role in CSR implementation (Iaonnou and Serafeim, 2014). Firms in advanced countries typically take regulatory and voluntary approaches to CSR issues and commit to similarly high CSR standards. Firms in emerging markets, on the other hand, tend to adopt less CSR practices than their counterparts from developed countries. For example, doing business in these economies is probably challenging as many are characterized by "either bad or weak public governance and administration, lack of public transparency, high levels of bribery and corruption, poor records of human rights, inadequate environmental, safety and labor standards, and high levels of poverty and inequality" (Nelson, 2004, p. 31). The varying socio-cultural-political contexts make it difficult for a customer to pressure its supplier to act responsibly. Therefore, CSR efforts along the supply chain will vary, depending on the country in which customers and suppliers do their businesses. We test this conjecture by replicating our baseline regression results shown in column (4) of Table 2 on a sample of suppliers and customers located in countries with high vs. low national CSR standards. We employ Vigeo sustainability country index to rank the 50 countries in our sample. We classify the top 25 countries as those with high national CSR standards and the rest as those with low

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national CSR standards. Our analysis also includes tests on a sample of customers and suppliers resided in the U.S. and on another located in non-US countries. Results are shown in Table 3.

Several notable findings emerge from the table. When both the supplier and customer are located in countries with high or in low CSR standards (columns (2-3)), the customer has the ability to influence its supplier to operate in a socially responsible way. It is plausible that both parties are in countries with similar socio-cultural-political environments and hence, recognize the economic and social importance of committing to better CSR standards. The coefficients on customer CSR^C Score are positive and strongly significant at the 1% level; they are 0.043 (standard error = 0.006) in column (2) and 0.013 (standard error = 0.008) in column (3). These findings may indicate that while the customer and supplier are in countries with similar CSR standards, there are still adequate variations in their CSR ratings that induce the supplier to improve its CSR performance. However, when the customer is located in a country with high CSR standard, it faces challenges to influence its suppliers located in countries with low CSR standards to implement similarly high CSR practices as the suppliers could find such implementations to be too costly. Similarly, the results provide no evidence of CSR spillover from a customer resided in a low CSR country to a supplier in a high CSR country. This finding is intuitive, as it is hard to impose high CSR standards on suppliers when the customer itself may not maintain a high CSR standard.

In column (5), when the locations of both the customer and supplier are restricted to the U.S., we find a marginally significant and positive CSR^C Score of 0.018 with standard error of 0.010. There appears some cross-sectional variation in the CSR rating across supplier and customer firms in the U.S., such that the customer is able to influence the supplier to engage in better CSR practices.[14] In column (6), when the customer and supplier are in non-US countries, the CSR spillover is stronger. Combined, these results are suggestive that our baseline evidence is driven by customers and suppliers from both the U.S. and non-US countries.

[14] We have also conducted a similar test based on non-US countries, but required that both the supplier and customer are in the same country. Our untabulated results suggest no strong evidence of CSR spillover effect, an indication that there is seemingly a larger degree of homogeneity in their social responsibility and ethical behaviors.

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3.3. Additional tests

3.3.1. The positive customer-supplier CSR relationship

We conduct additional tests to rule out the alternative interpretation of our baseline result that customers with weak CSR performance induce suppliers to become less socially responsible. We construct two additional CSR measures that capture the differential CSR between customers and suppliers (CSR Gap); one measures the difference between CSR^C and CSR^S ratings, whereas another is a binary indicator that equals one if CSR^C Score is greater than CSR^S Score and zero otherwise. We therefore test the following specification.

$$\begin{aligned}\text{CSR}^S\ \text{Score}(t+1) = a_0 + a_1\text{CSR}^C\ \text{Score}(t) \times \text{CSR Gap}(t) + a_2\text{CSR}^C\ \text{Score}(t) \\ + a_3\text{CSR Gap}(t) + \sum_{k=1}^{K} b_k \boldsymbol{X_k}(t) + \mathbf{FE}(t) + \epsilon(t+1).\end{aligned} \tag{2}$$

If customers have a positive influence on suppliers' subsequent CSR performance, the coefficients of both the interaction variable, CSR Gap $\times$ CSR^C Score, and customer CSR^C Score should be jointly positive. That is, the estimates of a_1 and a_2 are positive. Results displayed in columns (1)-(2) of Panel A, Table 4 further confirm our baseline finding that customers play a significant role in suppliers striving for high CSR standards. For example, the overall customer effect of CSR on supplier CSR is 0.820 (=0.016+0.804) in column (1) and is 0.177 (=0.121+0.056) in column (2). All the coefficients are statistically significant at conventional levels.

3.3.2. Alternative CSR databases

Oftentimes, one contends that the key evidence of a study is specific to the sample of data it employs.[15] In other words, it is plausible that our baseline finding of the unilateral CSR effect from customers to suppliers is attributed primarily to the ASSET4 data used in our study. The coverage of ASSET4 data is fairly extensive, and the database is also widely employed in a number of important studies, as cited in the Introduction section. Still, it is arguable that the assignment

[15] Chatterji et al. (2016) suggest that for every CSR research, one has to cross-validate the results using several different ESG samples/data sources.

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of individual firm ratings may be biased toward the methodology ASSET4 adopts. To rule out this possible bias, we employ two alternative CSR ratings databases, namely the MSCI IVA and Sustainanalytics databases, which are also widely used in the literature. We then repeat the estimation of columns (4) and (5) in Table 2 using firm-level ratings assigned by the two alternative databases. Results in Panel B of Table 4 find the customer effect of CSR on supplier CSR, but not the supplier effect of CSR on customer CSR.[16] The results of our key finding remain materially unaffected; the coefficients of CSR^C are positive and strongly significant, whereas those of CSR^S in the last two columns yield inconsistent signs and are statistically insignificant. Thus, these findings further underscore the robustness of our baseline evidence that the unilateral CSR effect along the supply chain is not specific to the ASSET4 ratings employed in our earlier analyses.

3.3.3. Environmental and social issues

Thus far, we employ firm-level composite CSR indexes to test the customer effect of CSR in the supply chain. But it is likely that the effect might be concentrated in a specific aspect of corporate social initiatives, such as those pertaining to either environmental (Env) or social (Soc) issues.[17] We again repeat the analysis of columns (4) and (5) of Table 2 by replacing the composite CSR score by each component rating (i.e., Env or Soc Score) in turn. Results presented in Panel C of Table 4 further corroborate the robustness of unilateral CSR effects in environmental and social issues only from customers to suppliers. Specifically, the greater the customer's environmental and social ratings, the higher are its supplier's subsequent environmental and social ratings. The coefficients of Env^C and Soc^C Scores are 0.032 and 0.013, respectively, and both coefficients are statistically significant at conventional levels. In contrast, those of Env^S and Soc^S Scores display no relation between the supplier's environmental and social ratings and its customer's.

[16] In Panel B of Table 4, the coefficient of IVA CSR^C is 0.014. Using IVA ratings, Liang and Renneboog (2017) find that, on average, firms in civil law countries have a 7% higher CSR score (or a half-grade on a 0 to 6 scale) than firms in common law countries (columns (1) and (2) of Table IV, p. 873), whereas our economic significance is about 3.3% (=0.014× 2.34) which is about half of Liang and Renneboog's. In other words, the customer effect of CSR is about half of the legal origin effect of CSR.

[17] We do not consider the corporate governance aspect of CSR, even though the databases contain ratings of firm-level governance. Our concern is that such ratings may not reflect the typical corporate governance issues examined by academic researchers (see Hong, Kubik, and Scheinkman, 2012). To avoid any misleading results, we focus strictly on the firm's environmental and social aspects of CSR.

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3.3.4. Falsification tests

We conduct another robustness check on the baseline evidence through falsification tests. We designate pseudo suppliers by matching true suppliers to pseudo suppliers by industry and by country in terms of the number of overlapped sectors and of similar size. Revere provides information on a firm's number of overlapped sectors to determine the firm's closest rival. For example, Yahoo and Answers.com are the closest rivals to Google in that these rivals and Google overlap substantially in the number of sectors they operate in. In a given industry,[18] we match a pseudo supplier ($S_{Industry}$) that is closest in size and in rivalry to a true supplier, but is not linked to the true supplier's customer. We repeat the same procedure by constructing another pseudo supplier ($S_{Country}$) from the same country as the true supplier. The results, reported in Panel D of Table 4, show no spillover CSR effect from a true customer to a pseudo supplier, thereby reinforcing our key result that customers can influence only their own supplier's CSR performance but not their suppliers' competitors.

4. Identification Strategies using Quasi-Randomized and Quasi-Natural Experiments

Identifying the impact of customers on their suppliers' future CSR performance poses an empirical challenge. The customer effect on supplier CSR might reflect the endogenous selection made by corporate customers. One might tackle this issue by examining the impact of government-mandated initiative or newly instituted country-level ESG regulation on CSR propagation in the supply chain. A critical problem with such approaches is that these regulatory outcomes typically bear different implications from those arising from voluntary CSR engagements. As a result, any mandatory action taken by customers that, in turn, affects suppliers does not necessarily reflect CSR, which is mostly voluntary and beyond the regulation. To circumvent such empirical issues, we instead employ two different identification strategies. First, we follow Flammer (2015a) and Cao, Liang, and Zhan (2018) by adopting the RDD approach to examine the causal effect of voting outcomes of customers' close-call CSR proposals on suppliers' future CSR performance. Second,

[18] We use the Fama-French 30-industry classifications.

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we explore a couple of exogenous shocks related to unexpected product safety scandals that have created global shocks to consumerism and the general public.

4.1. Evidence from CSR-related shareholder-sponsored proposals

Our study employs a sample of 31,634 customer CSR-related shareholder-sponsored proposals[19] that allows us to examine $t+1$'s CSR scores of suppliers whose customers marginally pass a CSR proposal in year t ("Pass" suppliers) with year $t+1$'s CSR scores of suppliers whose customers marginally reject a CSR proposal in year t ("Fail" suppliers). Using RDD, we estimate the difference in average CSR scores between Pass suppliers and Fail suppliers. RDD is based on a nonparametric, "local" linear estimation, where small "neighborhoods" (bandwidths) around the threshold are used to estimate discontinuities in the supplier's reaction. Following Imbens and Kalyanaraman (2012) and Cao, Liang, and Zhan (2018), we utilize a nonparametric linear estimation approach to capture the difference in future CSR performance between Pass and Fail suppliers with respect to the passage and failure of a CSR proposal by their associated customer firm, as follows.

$$\text{CSR}^S(t+1)\ \text{Score} = a_0 + a_1\text{Pass}(t) + a_2\ \%\text{Votes For CSR Proposal} + \epsilon(t+1), \tag{3}$$

where Pass is a binary indicator that equals 1 if the supplier's customer passes a CSR-related proposal and 0 otherwise, and %Votes For CSR Proposal is the percentage of vote shares in favor of the CSR proposal, centered at the threshold (a level specified by the firm). In (3), a_1 captures the discontinuity at the majority threshold – the difference in outcomes between Pass and Fail suppliers.

We first verify the randomness assumption of our RDD setting, which requires that the suppliers of customers whose voting shares are marginally below or above the threshold should be similar on the basis of ex ante characteristics. Otherwise, the passage of close-call CSR proposals would not be viewed as a random assignment if it is somewhat associated with supplier firm characteristics prior to the vote. Results contained in Panel A of Table 5 suggest no systematic or significant difference between Pass and Fail suppliers around the majority threshold, which lends support to

[19] Shareholder-sponsored proposals are typically non-binding.

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our identification strategy. Panel B shows RDD estimates of the difference in CSR performances between Pass and Fail suppliers, with different bandwidths. Figure 3 provides a visual confirmation of the suppliers' reactions to the outcome of their customers' voting proposals. The coefficient of the binary indicator Pass is positive and statistically significant at the 10% level across different specifications of bandwidth and when the dependent variable is measured by ΔCSR^S. The a_1 estimate is 6.988 under the data-driven optimal bandwidth, indicating that the CSR score gap between Pass and Fail suppliers is almost 7 points. Given that the mean CSR score is 63.74 with a standard deviation of 29.09, a 6.988 gap is about 24% of the standard deviation of CSR score. In comparison, Cao, Liang, and Zhan (2018) estimate the gap to be about 38% of the standard deviation of CSR score (using KLD ratings) in their investigation of US firms reacting to their product-market peers' commitment to CSR. The difference in the findings probably reflects the larger US firms that are more explicit about CSR practices (Matten and Moon, 2008), compared to our sample of international firms, which are generally smaller and would, expectedly, experience a smaller reaction.

While suppliers improve their CSR practices following the passage of the voting customer firms' proposed CSR adoption, it is unclear whether such passed proposals are implemented, or they are conducted without a proposal being passed. Thus, one may interpret that, to a certain extent, the passage of a CSR proposal simply conveys a signal about a customer's commitment to CSR. To address this imperfect compliance issue and to disentangle the effect of signaling and actual adoption, we follow Cao, Liang, and Zhan (2018) and perform a fuzzy RDD analysis to estimate the customer CSR effect on a supplier. The first stage of a fuzzy RDD is to estimate the probability of implementation at a firm-specific cutoff, whereas the second stage provides the estimate that adjusts for the imperfect compliance. We consider three definitions of CSR implementation:[20] (1) News about CSR implementation; (2) Increase in ASSET4 ratings by at least 10 grades (out of 100) but still within a reasonable range (such as within 20 grades, and we also enlarge this range in robustness tests to over 50 and obtain similar results); (3) Board recommends "YES" (or "FOR") to the proposal before the vote, as this is *ex ante* observable at the time of the vote and increases the likelihood of the voting firm actually implementing the proposal. Results are reported in Panel

[20]Details of these definitions and construction are shown in Appendix Table A.3.

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C. This probability increases by 23.9%-79.3% if the voting percentage surpasses a firm's specific threshold. The second-stage results are all positive and statistically significant after adjusting for the probability of implementation.

We now turn to testing whether an implemented proposal has a greater impact on the supplier firms than one that is not implemented. We examine all the passed proposals and then compare supplier responses, conditional on whether the customer firm implements its proposal. The results, as reported in Panel D, indicate greater and statistically significant CSR improvements in the subsample of implemented than in that of non-implemented proposals for both news of CSR implementation and board voted "For" categories, while not statistically significant for the increase in ASSET4 ratings category. For example, the adjusted CSR improvements are 5.778 based on the news about CSR implementation and 3.990 based on the definition that the Board recommends in favor of the proposal, and these improvements are statistically significant at conventional levels. Overall, the evidence suggests that the passage of a customer's CSR proposal has a real effect on its suppliers' subsequent CSR performance – the customer's CSR implementation induces its suppliers to improve their CSR practices. In other words, if a proposal is subsequently implemented, the customer CSR effect on a supplier is even stronger than simply getting it passed.

4.2. Evidence from global product-safety scandals

Our second identification strategy focuses on some of the worst product safety issues or scandals in history based on our extensive search on the Internet that have drawn global attention and heightened societal awareness and activism demanding for more socially responsible practices along supply chains. While there are a number of human rights scandals in developing countries that have also drawn public outcry and to questions the CSR across global supply chains,[21] it is conceptually difficult to comprehend why customer stakeholders would care about their suppliers' human rights issues in developing countries.[22] Thus, in this subsection, we focus on the Chinese milk scandal and

[21] For example, Nike has long been accused of abusive labor practices since the early 1970s when outsourcing its manufacturing to developing economies with labor practices which would be considered illegal in the U.S. Other examples include the 2012-2013 devastating workplace disasters in Pakistan and the collapse of a factory in Bangladesh, together claimed more than 1,300 lives.

[22] Nevertheless, we have analyzed the infamous Nike's worker abuse scandal in 2005 and the Rana Plaza building collapse (Bangladesh) in 2013, and our unreported results show stronger positive CSR spillover effects following these unexpected shocks.

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Toyota car/Takata airbag recalls that may put the light on the influence of corporate customers towards the CSR practices of their suppliers. The 2008 Chinese milk scandal involves infant milk formula adulterated with melamine exploded when 16 infants in China's Gansu Province were diagnosed with kidney stones after consuming the melamine-tainted milk powder.[23] Subsequently, an estimated 300,000 babies in China were sick from consuming the contaminated milk, and the kidney damage led to six deaths. The World Health Organization claimed this incident was one of the largest food safety events it has had to deal with in recent years, and the incident raised serious concerns about food safety, not only in China but also across the world.

The other event is the recalls issued by Takata and Toyota in 2013. At least 7 million cars worldwide had been recalled for defective airbags made by Takata, and potentially 42 million cars in the United States were affected. The problem was the defective metal airbag inflators. When deployed, the huge explosive force may disintegrate the canister of the inflator sending metal shrapnels into the passenger cabin and possibly injuring or killing the occupants in the vehicles. According to the Consumers Report,[24] this problem resulted in 16 deaths and about 180 injuries reported worldwide, and affected 19 automakers. Toyota recalled more than one million vehicles sold in the United States over faulty airbags and windshield wipers. The National Highway Traffic Safety Association has called this "the largest and most complex safety recall in U.S. history."[25]

To examine the impact of such exogenous shocks arising from product safety scandals on the customer-supplier CSR propagation, we utilize a subcomponent of the ASSET4 ESG ratings, namely the rating on product responsibility (Product), and follow Liang and Renneboog's (2017) difference-in-differences approach, as given by

$$\begin{aligned}\text{CSR}^S \text{ Product Score}(t+1) = a_0 + a_1 \text{CSR}^C \text{ Product Score}(t) \times \text{Event} + a_2 \text{CSR}^C \text{ Product} \\ \text{Score}(t) + a_3 \text{Event} + \sum_{k=1}^{K} b_k \boldsymbol{X_k}(t) + \mathbf{FE}(t) + \epsilon(t+1),\end{aligned} \tag{4}$$

In (4), CSR^S Product Score is the supplier's firm-level rating on product responsibility, CSR^C Product Score is its customer's product responsibility rating, Event is a binary indicator that

[23] https://en.wikipedia.org/wiki/2008_Chinese_milk_scandal.

[24] https://www.thestar.com/business/2017/02/27/attorneys-say-five-automakers-knew-takata-airbags-were-dangerous.html.

[25] https://www.theverge.com/2016/5/4/11591724/takata-air-bags-largest-recall-nhtsa.

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equals 1 if it is the specific event year (i.e., the event year for the China milk scandal is 2008, and for the Takata and Toyota recalls is 2013) and 0 otherwise.[26] Column (1) of Table 6 shows estimates of model (4) on a subsample of the *existing* linked firms in the global food-related industry suppliers from China. Column (2) of the same table reports those using a subsample of firms in the global auto industry with suppliers from Japan and either customers or suppliers from the auto industry in all countries.

The variable of interest is the interaction between CSR^C Product Score and Event indicator, and its coefficient is positive and statistically significant in both cases. Their coefficient is 0.250 (robust standard error= 0.145) in column (1) and 0.268 (robust standard error= 0.122) in column (2).[27] In terms of economic significance, a one-standard-deviation increase in the customer's product responsibility rating (i.e., 27.91, Table 1) in the scandal year will lead to a 9.0% ($= (0.268 - 0.082) \times 27.91/57.51$) to 10.9% ($= (0.250 - 0.026) \times 27.91/57.51$) rise in the supplier's mean product responsibility rating in columns (2) and (1), respectively. These findings suggest that the effect of a customer's product responsibility rating on the supplier's next-period product responsibility rating is more pronounced in the event year, an indication that the pressure from corporate customers driving suppliers to improve their CSR becomes more intense when public demands for responsible business practices are greater following major product safety scandals.

We also compare our results on the 2008 Chinese milk scandal with that of Liang and Renneboog (2017), whose study also includes this particular scandal. The two authors investigate firms' reactions to product safety issues across legal regimes, whereas ours focuses on whether customers respond to such issues by forcing suppliers to comply to higher CSR standards. Specifically, they find that firms in civil law countries react more strongly towards the Chinese milk scandal than firms in common law countries by about 5% (see Column (1) of Table VIII, Panel A, p. 884) post 2009 (i.e., 2009-2014). As discussed above, the economic magnitude associated with the 2008 Chinese milk scandal is 10.9% rise in the supplier's mean product responsibility rating. In other words, the supplier's average product responsibility rating will increase from 57.51 to 63.78 in the following

[26] Note that the Event indicator does not capture post-event years because we expect the CSR gap would not be long lasting after such large-scaled scandals and media exposure.

[27] It is worthwhile to mention that when we interact CSR^C Product Score with other year dummies, our unreported results show that none of the coefficients of the interaction term is statistically significant. Such placebo tests provide further reinforcing evidence of stakeholder effects in CSR activities along the global supply chain.

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year. Our results therefore suggest that the customers must have compelled their suppliers to act immediately to such a global scandal, as their resulting reaction in improved CSR performance is about twice the size of the average effect shown in Liang and Renneboog, who measure the average effect five years after the event. Overall, the evidence lends further credence to our causal inferences of our baseline finding (based on cross-sectional analyses) that the stakeholder orientation of CSR is only from customers to suppliers.

Oftentimes, scandals hurt not only the stock price, sales, and brand reputation of the corporation in question but also those of its customers. RepRisk, a leading research and business intelligence provider which specializes in ESG and responsible business conduct risks, evaluates firm-level risk exposure to ESG issues and dynamically quantifies reputation risk exposure pertaining to all ESG scandals to construct a firm's reputation risk (RepRisk) index at the monthly frequency. Based on the firm-level RepRisk index, we graph in Figure 2 the RepRisks of both suppliers and their customers following all ESG scandals that occur at $t = 0$, identified by RepRisk. The graphs provide anecdotal evidence that ESG scandals not only increase the suppliers' own reputation risk index but also their customers'. To formally examine the effect of suppliers' scandals on their customers' reputation risk, we replicate the regression model (4) by replacing Product Score by RepRisk index as follows.

$$\begin{aligned}\text{RepRisk}^C(t+1) = a_0 + a_1\text{RepRisk}^S(t) \times \text{Month} + a_2\text{RepRisk}^S(t) + a_3\text{Month} \\ + \sum_{k=1}^{K} b_k \boldsymbol{X_k}(t) + \mathbf{FE}(t) + \epsilon(t+1),\end{aligned} \tag{5}$$

Specifically, in (5), we test whether the reputation risk of suppliers associated with the above two product safety scandals occurred in a specific month (Month) of the scandal year affects the reputation risk of customers. Results from columns (3)-(4) of Table 6 suggest strong evidence of a positive association between the supplier's RepRisk index and the customer's next month's RepRisk index. The transmission of RepRisk from the supplier to the customer provides a strong incentive for the customer to strengthen its influence on its supplier's CSR when a global ESG scandal floods worldwide news media. Our unreported results show that consistent with the graph shown in Figure 2, the RepRisk transmission effect fades away three to five months after the scandal

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broke, an indication that our finding is scandal-specific rather than a result of increasing CSR over time.

Collectively, all the above tests bolster a causal interpretation of our baseline evidence that customer CSR exhibits a significant impact on the subsequent supplier CSR. We now turn to analyzing the potential mechanisms by which corporate customers can exert influence.

5. The Mechanisms

One key mechanism by which customers might influence a supplier's CSR is through assortative matching. For example, customers with high CSR are more likely to select suppliers who will meet their expectations of socially responsible behavior. Alternatively, it is also possible that the customers actively push suppliers to get more involved in CSR and embrace it. In this section, we examine these two possible avenues.

5.1. Assortative matching between customers and suppliers

A positive assortative matching between customers and suppliers is a possible channel when customers seek to form a relationship with suppliers that have the propensity to engage in similar CSR practices as theirs. On the other hand, the customers may severe their relationships with suppliers when the latter fail to meet the customers' CSR standards (e.g., Banerjee, Dasgupta, and Kim, 2015). To test this potential matching or selection channel, we compare two cases of the formation/severance of customer-supplier relationships – one is due largely to potentially endogenous reasons and the other results mostly from exogenous shocks.

First, we construct a sample of customer-supplier pairs that have experienced a change in relationships at any point in our entire sample period. For example, if a supplier (customer) reports a relationship with a customer (supplier) for the first time in the sample period, we classify the two firms as linked. Alternatively, if a supplier and a customer no longer report their relationship which has previously existed in the sample period, we consider the chain to be delinked. It is important to highlight that customer-supplier pairs that do not experience a change in the relationship during our sample period (i.e., always linked or never linked firms) do not enter into the sample. Under-

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standably, two firms being first linked or first delinked in a supply-chain relationship can be due to either endogenous reasons (such as selection and matching) or exogenous reasons such as the supply chain is interrupted by external forces.

To capture the change-status effect, we use two binary indicators, namely Post Link and Post Delink. Post Link (Delink) is a binary indicator that equals 1 if the customer and supplier first establish (severe) the relationship and 0 otherwise. We then run the following regression.

$$\begin{aligned}\text{CSR}^S\ \text{Score}(t+1) = a_0 + a_1\text{CSR}^C\ \text{Score}(t) \times \text{Post Link/Delink}(t) + a_2\text{CSR}^C\ \text{Score}(t) \\ + a_3\text{Post Link/Delink}(t) + \sum_{k=1}^{K} b_k \boldsymbol{X_k}(t) + \mathbf{FE}(t) + \epsilon(t+1),\end{aligned} \tag{6}$$

In model (6), the key independent variable is the interaction between CSR^C Score and Post Link (or Post Delink). Results are shown in Table 7. We find that in newly established economic links, the customer CSR is positively associated with the subsequent supplier CSR. The estimate of a_1 is positive and statistically significant at the 1% level after the customer and supplier firms establish an economic relationship. Column (1) shows the overall customer CSR effect of 0.013 (=0.020-0.007) on supplier CSR, suggesting some selection associated with the initial establishment of the relationship. On the other hand, when the supply chain is terminated, the customer no longer exhibits any significant influence on suppliers during the post-delink period. The interaction term of CSR^C Score and Post Delink (column (2)) is statistically insignificant in the post delinked period, even though Post Delink itself is still significant at conventional levels. If the assortative matching is the channel through which customers facilitate CSR propagation along the supply chain, a severance of the relationship between the customer and its supplier does not imply a weakened CSR spillover effect, unless such a severance is exogenous. In other words, socially conscious customers choose firms with high CSR potentials to form a supply chain relationship, and dissolve the relationship if the supplier is constrained by its ability to further improve its CSR standards.

While the baseline evidence could be driven by customers having preferences for suppliers who would be willing to assume greater corporate social responsibilities, our unreported results suggest that the customer effect of CSR still holds even after we remove the observations when customers and suppliers first establish their relationship, indicating that there is an additional effect that goes

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beyond pure selection.

Second, we focus on target firms of M&As as a relatively exogenous reason for the termination of customer-supplier relationships. The reason why we examine only targets, and not acquirers, is that target firms are typically not being acquired by their own choices. For example, when a supplier is acquired by a third party, the economic link between the supplier and its existing customer could be weakened as there is no economic link between the supplier and acquirer prior to the acquisition. Such an acquisition would be different from an M&A where a customer (i.e., the acquirer) intentionally merges with the supplier to establish an upstream integration. Similarly, when a customer is targeted by a supplier with no prior link with the customer, the customer's relationship with its existing supplier might diminish following the acquisition.

Our sample contains 839 customer or supplier firms with ASSET4 ratings that are M&A targets and eventually acquired by another firm. To implement our test, we define a binary indicator, Post M&A, which captures the supply chain relationship following the completed acquisition of a target supplier or customer, and run the following regression.

$$\begin{aligned}\text{CSR}^S\ \text{Score}(t+1) = a_0 + a_1\text{CSR}^C\ \text{Score}(t) \times \text{Post M\&A}^{\ S\ \text{or}\ C}(t) + a_2\text{CSR}^C\ \text{Score}(t) \\ + a_3\text{Post M\&A}^{\ S\ \text{or}\ C}(t) + \sum_{k=1}^{K} b_k \boldsymbol{X_k}(t) + \mathbf{FE}(t) + \epsilon(t+1).\end{aligned} \tag{7}$$

In columns (1)-(2) of Table 8, we estimate the impact of all acquisitions on the supplier's subsequent CSR performance. Columns (3)-(4) and (5)-(6) of the table show separate results of suppliers as targets and customers as targets, respectively. Columns (2), (4), and (6) report the effect of customers whose CSR ratings are above the median level of the sample customer CSR rankings. If a customer or supplier is targeted and then acquired by a third-party firm with no associated economic link, the CSR propagation effect ought to become weaker following the acquisition. For instance, in column (1), the combined customer's CSR effect on the supplier's next period CSR Score is -0.038 ($= -0.051 + 0.013$). A closer analysis suggests that the negative effect is driven mainly by acquisitions of suppliers. As seen in columns (3)-(4), when a supplier is the target, its subsequent CSR practices become negatively associated with its customer's, especially when the latter is above the median level. It is plausible that the supplier pays less attention to its CSR

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practices during and immediately after the acquisition process. Alternatively, this may imply that the supplier's acquirer is unwilling to expend more resources to maintain the sustainability of the supplier's CSR standard, or that the supply chain is severed following the acquisition. In contrast, when a customer is the target, the acquisition has no bearing on the supplier's subsequent CSR performance. The implication is that such acquisitions do not break down the supply chain and hence, display no effect on the existing CSR collaboration.

Taken together, the results of Tables 7 and 8 suggest more concrete inferences on the selection or matching mechanism. When two firms are economically delinked due to either exogenous or endogenous reasons, such delinks do not mitigate the customer effect of CSR on the supplier's CSR (i.e., the interaction term bears an insignificant coefficient, a_1). In contrast, when the severance of a relationship is more likely due to exogenous reasons (i.e., acquisitions by a third party), the propagation effect is significantly reduced. This potentially points to the presence of a selection process in explaining the CSR spillover along the supply chain.

5.2. How corporate customers actively influence suppliers' CSR activities

As stakeholders – governments, legislators, consumers, employees, activist groups – intensify their expectations of corporate responsibility to society, such demands put the light on the influence of corporate customers towards the CSR practices of their suppliers. Our analysis evaluates two ways that corporate customers can push suppliers to act; one is through bargaining power and another is through directly influencing the decision-making process of suppliers.

5.2.1. Degree of stakeholder bargaining power

The extent to which customers can exert considerable pressure on suppliers and demand for improved CSR depends on the customers' bargaining power. We argue that when customers have low bargaining power, suppliers can afford to withhold and avoid incurring cost of concession to meet the customers' demand for better CSR practices. To test this bargaining power channel of CSR effect along the supply chain, we look at suppliers' investments specific to customers as well as the intensity of industry competition for customers and suppliers.

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(a) *Relationship-specific investments*

Existing studies have established that customers from research-intensive industries tend to involve in specialized inputs that require their suppliers to make transaction-specific investments, consistent with their own investments (e.g., Armour and Teece, 1980; Levy, 1985; Allen and Phillips, 2000; Dhaliwal, Shenoy, and Williams, 2016; Chu, Tian, and Wang, 2017). Extending this strand of research, we argue that suppliers with more investments in innovation are more likely to engage in customer-specific investments. We therefore hypothesize that the greater the supplier's innovation capacity, the customers would have less power to influence their suppliers to be more socially responsible.

Following Chu, Tian, and Wang (2017), we employ the amount of R&D relative to total assets and the log of the number of registered patents as proxies for a supplier firm's investments in innovation specific to the customer's needs. We then conduct the following regression.

$$\begin{aligned}\text{CSR}^S\ \text{Score}(t+1) = a_0 + a_1\text{CSR}^C\ \text{Score}(t) \times \text{Innov}^S(t) + a_2\text{CSR}^C\ \text{Score}(t) \\ + a_3\text{Innov}^S(t) + \sum_{k=1}^{K} b_k \boldsymbol{X_k}(t) + \mathbf{FE}(t) + \epsilon(t+1).\end{aligned} \tag{8}$$

In (8), we evaluate the impact of a supplier's innovation (Innov^S) on the supplier's CSR Score,[28] conditional on its customer's CSR. We expect the coefficient of the interaction between Innov^S and the customer's CSR Score (i.e., CSR^C Score) to be negative if the customer relies heavily on the supplier's innovation. In other words, when suppliers make large investments specific to customers' needs, they would be in a better bargaining position to decide whether or not to to align their CSR practices with those of their customers. The results reported in columns (1)-(2) of Table 8 are consistent with our expectations.

We find that the interaction effect of CSR^C Score and Innov^S is negative and statistically significant for both proxies of the customer-specific investment. For instance, the coefficient of CSR^C Score x $\text{R\&D}^S$ is -0.323 and is statistically different from zero. This finding suggests that when a supplier's customer-specific investment is low, the supplier is more inclined to meet the CSR

[28] We have also examined whether a customer's innovation activity has any effect on a supplier's CSR performance. Unreported results suggest that investment in innovation does not give customers strong bargaining power to drive CSR in suppliers.

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standard of its customer. Alternatively, when there is less resource dependence in the customer-supplier relationship, the customer would have more power to demand for a higher CSR standard in its supplier. Thus, the extent of the customer-specific investment is one mechanism that drives the supplier's desire to align its CSR with that of its more socially responsible customer.

We recognize that our findings are also consistent with a learning channel. A significant part of CSR initiatives relates to product innovation and production process by using environmental-friendly technologies and engaging in R&Ds that enhance product safety and responsibility. Such processes involve learning from customers and feedback to suppliers; more innovative suppliers would have less of a need to learn from their customers. Hence, in line with the evidence, it would be harder for customers to influence highly innovative suppliers.

(b) *Intensity of industry competition*

The intensity of competition in an industry is one determining force that drives the bargaining power of suppliers and customers. A supplier has strong bargaining power if there are barriers to entry, fewer threats of substitutes, the industry is highly concentrated or low intensity of industry rivalry, and customers have weak or no power. Conversely, a customer has high bargaining power if it has fewer competitors, substitutes are available, little product differentiation, and its purchases comprise a large portion of the supplier's sales. Thus, the degree to which customers are able to pressure suppliers to achieve high CSR standards is determined by the intensity of industry competition of the supplier and customer. We measure the intensity of competition using the Herfindahl-Hirschman Index (HHI). A customer's HHI is measured by the summation of squared market share (based on sales) of each firm within the same industry, whereas a supplier's HHI is measured within the same global industry to approximate the level of competition suppliers encounter globally by squaring the market share of the firm's sales in the industry and then summing the squares.[29] We then estimate (8) by replacing the innovation variable with HHI and present the results in columns (3)-(4) of Table 9.

Column (3) evaluates the effect of a supplier's HHI^S on supplier CSR^S Score, whereas column (4) assesses the impact of a customer's HHI^C. When the supplier is in a highly competitive industry,

[29] An industry is defined using Fama and French's 48 industry classifications.

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it tends to align its CSR practices with that of its customer. The coefficient of the interaction variable, CSR^C Score x HHI^S is negative and statistically significant at the 1% level. This finding probably suggests that the supplier may lose its customer if it does not improve its CSR standard. On the other hand, when a customer is in a less competitive industry, it has strong bargaining power to influence its suppliers to be more socially responsible. The coefficient of CSR^C Score x HHI^C is positive and statistically significant at the 5% level (i.e., 0.048 with robust standard error of 0.023; column (4)). Combined, these results suggest that the stakeholder bargaining power plays a critical role in propagating CSR along the supply chain.

5.3. Influencing the decision-making process of suppliers

Extant literature has shown that corporate behavior propagates through networks of decision-making bodies, namely owners and directors. Common ownership exists between two firms whenever an investor owns shares of both firms, and two firms are board-linked whenever they have shared directors on their boards. Such network structures are one potential mechanism for spreading corporate policies from firm to firm. This subsection examines whether shared ownership and interlocking corporate boards affect CSR efforts along supply chains.

5.3.1. Common ownership

There is substantial robust evidence that institutional investors, who are large equityholders, play a critical role in corporate policies of the firms they invest in. In recent years, several studies find that institutional cross-ownership influences the outcomes of mergers and acquisitions (e.g., Matvos and Ostrovsky, 2008; Harford, Jenter, and Li, 2011), industry competitiveness (e.g., Azar, Raina, and Schmalz, 2016; Azar, Schmalz, and Tecu, 2017; He and Huang, 2017), return correlations (Antòn and Polk, 2014), CEO pay incentives (Antòn et al., 2016), and customer-supplier links (Freeman, 2017). In particular, Freeman shows that common institutional ownership in both the customer and supplier strengthens their supply chain relationship. Based on her finding, it is plausible that common ownership is a channel through which a supplier's CSR is aligned with its customer's.

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Our analysis employs two different measures of common institutional ownership. Our first measure computes the maximum percentage of ownership held by all common owners in the supplier (customer) in a given year, and this measure is labeled, "%Shares ComInst^S". We compute the same for the customer firm and label it "%Shares ComInst^C". The other measure is based on the log of the number of common institutional investors that invest in both firms in a given year and is represented by "#ComInst". Using these measures, we estimate the following model.

$$\begin{aligned}\text{CSR}^S\ \text{Score}(t+1) = a_0 + a_1\text{CSR}^C\ \text{Score}(t) \times \text{ComInst}^{S\ \text{or}\ C}(t) + a_2\text{CSR}^C\ \text{Score}(t) \\ + a_3\text{ComInst}^{S\ \text{or}\ C}(t) + \sum_{k=1}^{K} b_k \boldsymbol{X_k}(t) + \mathbf{FE}(t) + \epsilon(t+1),\end{aligned} \tag{9}$$

where ComInst is either %Shares ComInst or #ComInst in a supplier or customer firm. If common institutional investors can influence their supplier firm to engage in socially responsible practices as their customer firm does, we expect the interaction between CSR score and measures of common institutional ownership to be positively correlated. Results of model (9) are reported in columns (1)-(3) of Table 10.

The table reveals one distinct evidence – the important role of common institutional investors in aligning the CSR of their portfolio of customer and supplier firms. We find that the interaction of the two measures of common institutional ownership with customer CSR^C Score yields positively and statistically significant effects on the next period's supplier CSR^S Score. For example, in column (1), the interaction term, CSR^C Score $\times$ %Shares ComInst^S, is 0.033 with robust standard error of 0.015. Column (3) produces a qualitatively similar finding based on the log number of common institutional investors in both the supplier and customer firms. The coefficient of the interaction term is 0.068 and is statistically significant at the 1% level. Thus, common institutional investors do seek to mobilize investor voice towards positive social impact along the supply chain.

In columns (4)-(5), we test the effect of an institutional investor who has an existing stake in the customer but later also holds a stake for the first time in the already linked supplier firm. The effect seems to be much stronger for the first-time holding, especially when common ownership is measured by the % of shares held; the coefficient of CSR^C Score x %Shares ComInst increases from 0.033 in column (1) to 0.383 in column (4). These findings suggest that common ownership paves

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the way for the subsequent CSR propagation along the supply chain.

5.3.2. Board interlocks

Economically-linked firms can also be connected through shared directors, where directors serve on boards of both the customer and supplier. One advantage of having shared directors is that directors can act in concert to promote similar CSR practices at both corporations. We therefore examine whether board connections through shared directors can, in part, influence CSR policies. To evaluate this channel, we construct two measures of common directors. The first measure is based on the log of the number of directors who serve on both the supplier's and customer's boards. To cite an example of interlocking directorates, in year 2006, Rudy Provoost was an Executive Vice President, division CEO, and board member of Philips, a Dutch technology company headquartered in Amsterdam, and at the same time, he was the head of board of directors (Chairman) at Philips's supplier, LG Display Company. An alternative measure is the log number of positions held by common board members. For example, in 2003, Garo Armen was CEO and Chairman of Agenus, Inc., a Lexington, Massachusetts-based biotechnology company focused on immunotherapy, and was also Board Chair and Acting CEO of Elan Corp, Agenus's supplier located in Dublin, Ireland. In this case, Armen held two positions on the supplier's board of directors. Results are presented in Table 11. Consistent with the evidence of Table 10, the results also suggest that common directors serve as another channel through which the customer firm is able to influence better CSR practices at its supplier firms. The coefficients of both interaction terms (CSR^C Score $\times$ # of Common Directors and CSR^C Score $\times$ # of Board Positions) in columns (1) and (2) are positive and statistically significant at the 1% level.

We also investigate the impact of the customer's directors who subsequently serve on the supplier's board for the first time. As shown in column (3) of Table 11, the estimate of the interaction term in question is positive and statistically significant at the 1% level. In fact, the sensitivity of the first-time board effect is stronger in column (3), compared to that in column (1), suggesting that board members help customers to push suppliers to implement better CSR policies. Our analysis, however, does not extend to evaluate a first-time board member who will hold multiple positions on the supplier's board. Our sample suggests that it is rarely the case that a director who newly

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comes on board holds more than one position. Thus, we are unable to conduct such an analysis.

Overall, the results provide corroborating evidence that the stakeholder bargaining position and collaboration among common institutional owners and common directors are instrumental in propagating CSR practices from customers to suppliers. Such influences go beyond a pure selection channel.

6. Economic Consequences of Customer Effects of CSR

In the preceding sections, we have shown that customers have a positive impact on suppliers' CSR practices, suggesting that suppliers do respond to their customers and behave similarly in socially responsible ways. However, a question that remains is whether there is any economic benefit arising from customers pushing suppliers for greater social responsibilities.

Existing studies dispute whether the benefits of CSR outweigh its costs. Some studies find that CSR initiatives can help firms build a social reputation (e.g., Fombrun and Shanley, 2005), attract more productive employees (Burbano, 2016), exploit new markets for environmentally friendly products (Arora and Gangopadhyay, 1995), and can be financially profitable through branding/reputation effects on different stakeholders (Baron, 2001). Bénabou and Tirole (2010) argue that CSR engagements are beneficial to firms in the long run and help strengthen their market positions. Other studies, however, show that adopting CSR policies is likely to increase costs and hurt firm performance, as firms redefine their corporate social responsibilities under the pressure of various stakeholders. CSR costs include major investment costs involving construction, equipment, or new environmental technologies and processes, permanent contributions such as scholarships, and other operating costs of CSR implementation. Margolis, Elfenbein, and Walsh (2010) provide a meta-analysis of the relationship between corporate social and financial performance, and document that the overall effect is positive but small.

Here we ask whether customers are financially incentivized to impose better CSR practices on their suppliers, and whether suppliers benefit from taking greater social responsibilities. The economic implications of these collaborative CSR efforts between customers and suppliers are closely related to the growing literature linking CSR to firm financial performance (e.g., Gillan et al.,

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2010; Edmans, 2011; Deng, Kang, and Low, 2013; Servaes and Tamayo, 2013; Flammer, 2015a; Krüeger, 2015; Lins, Servaes, and Tamayo, 2017). Most of these studies consider CSR engagements as a firm's own strategic choice, and investigate their direct and indirect effects on the firm's profitability and valuation. Some recent work also studies the role of various stakeholders, such as institutional investors (Dimson, Karakas, and Li, 2015; Dyck et al., 2018; Chen, Dong, and Lin, 2018) and competitors (Cao, Liang, and Zhan, 2018) in driving CSR engagements and their value implications. Unlike these studies, our analysis focuses on the economic consequences of the stakeholder (customer) effect of CSR on suppliers and not of firms' own CSR activities.

We postulate that collaborative CSR efforts between customers and suppliers would lead to increased operating efficiency, sales growth, and firm value, probably through enhancing branding and reputation effects, attracting more consumers, and generating greater sales. Improved CSR standard along a supply chain may involve the increased focus of product responsibility and safety, which in turn lower discretionary expenses, such as selling, general, and administrative expenses,[30] through improved operational efficiency. Customers and suppliers have desires to promote a sustainable relationship, through greater CSR efforts, if such efforts produce better future sales growth and enhanced firm valuation for both the customer and supplier. Our analysis uses the ratio of selling, general, and administrative expenses to total assets (SG&A), 3-year annualized future sales growth, and market-to-book ratio as measures of firm performance (Performance) associated with increased collaborative CSR efforts in a customer-supplier relationship. To evaluate the economic benefits associated with such efforts, we run the following regression model.

$$\begin{aligned}\text{Performance}^{\,S \text{ or } C}(t+1) = a_0 + a_1 \text{CSR}^C \text{ Score}(t-1) \times \text{CSR}^S \text{ Score}(t) + a_2 \text{CSR}^C \text{ Score}(t-1) \\ + a_3 \text{CSR}^S \text{ Score}(t) + \sum_{k=1}^{K} b_k \boldsymbol{X_k}(t) + \mathbf{FE}(t) + \epsilon(t+1).\end{aligned} \tag{10}$$

The variable of interest is the interaction of CSR^C Score$(t-1)$ and CSR^S Score(t) in (10). If the CSR effect on suppliers benefits both the supplier and customer, we should expect the coefficient of a_1 to be negative for SG&A whereas positive for future sales growth and market-to-book ratio. The interpretation is that high supplier CSR leads to better firm performance only conditioned on the customer's CSR being high. Such an interpretation is consistent with our above finding of CSR propagation along the supply chain, implying some degree of cooperative or collaborative efforts

[30] Kalwani and Narayandas (1995) show that maintaining long-term relationships with their customers decreases discretionary expenses, such as selling, general, and administrative expenses, and hence, improves profitability.

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between the supplier and the customer. Estimates of (10) are shown in Table 12. The dependent variables are SG&A, sales growth, and market-to-book ratio of the supplier in columns (1), (3), and (5), while those of its customer counterparts are shown in columns (2), (4), and (6).

We find that the stakeholder effect of CSR generates favorable economic outcomes. It therefore pays for customers to influence their suppliers to act socially responsibly, as such behavior has an overall positive impact on the customer's future performance. Customers enjoy not only improved operational efficiency in terms of lower SG&A, but also greater future sales growth and, albeit small,[31] firm valuation. For example, the a_1 coefficient is negative in column (2) but is positive in columns (4) and (6). Similarly, it is also worthwhile for suppliers to strive for better CSR standard that adheres to that of their socially responsible corporate customer – suppliers also experience decreased SG&A and enhanced firm value following their adoption of improved CSR practices. However, unlike their customers, suppliers do not experience any statistically significant increase in 3-year annualized future sales growth, even though the sign of the coefficient is positive.

In summary, this section shows evidence of economic benefits associated with the customer effect of CSR along the supply chain.

7. Conclusion

Many large corporate customers around the globe increasingly recognize the importance of integrating social responsibility initiatives into their business model to build a sustainable competitive advantage in the marketplace. However, the impact of their power as customers to drive improvements in responsible business practices through their global supply chains has not been widely studied. Our research exploits several unique international databases to examine whether and how their large stakes might give them an active role in suppliers' CSR initiatives and standards.

To investigate whether corporate customers affect suppliers' CSR, and if so, through which channels, we employ a regression discontinuity design that depends on exogenous variation in customers' close-call CSR proposals that pass or fail by a small margin of votes. Passing a CSR

[31] In their meta analysis of several existing empirical studies, Margolis, Elfenbein, and Walsh (2010) conclude that the overall correlation between CSR and corporate firm performance is positive but small.

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proposal results in about a 7% improvement in the suppliers' subsequent year's CSR performance. Our analysis also shows that in response to global shocks associated with product-safety scandals, customers exert pressure to accelerate their suppliers' product responsibility practices. Our study offers new insights on the real effects of CSR initiatives and actions.

The evidence suggests that corporate customers tend to establish supply chain relationships with firms that are inclined to engage in responsible social and environmental practices. Customers with greater bargaining power and with own directors and investors also having stakes in supplier firms make them an influential voice in decisions pertaining to suppliers' responsible business operations.

Finally, the collaborative CSR efforts resulting from the alignment of CSR standards deliver economic values to both suppliers and customers. Customers have incentives to aim for better CSR at their suppliers as higher CSR standard results in improved operational efficiency, sales growth and firm value, possibly through socially and environmentally friendly production and through enhancing branding and reputation effects. Similarly, suppliers also have the desire to engage in responsible business practices that adhere to those of their customers, as such adherence contributes to improving both operational efficiency and firm valuation.

What we document in this paper is not merely how one firm's CSR practices can affect another's; in fact, the multiplier effect that we stress earlier has significant policy implications. That is, increasing one firm's CSR can potentially have a ripple effect across the extensive global supply chains. If we view the evidence of our study at face value, several ideas emerge for the improvement of social welfare and firm performance. As multinational corporations around the world are increasingly interconnected via global supply chains and making significant impacts on billions of consumers, their value creation process and social responsibilities have become the foremost issues in public debate. Despite their importance, we still have limited knowledge on how their CSR practices are influenced by each other and spilled over along supply chains. Therefore, a firm's own socially responsible practices might have a multiplier effect through economic links and generate bigger positive social payoffs. However, our finding of the uni-directional CSR effect from customers to suppliers and only in some subsamples of countries suggest that such effects are bounded by a firm's relative position in the global network and its socio-cultural and institutional environment. This potentially indicates that policies aiming at promoting socially responsible practices among

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public companies cannot be universally applied.

Our findings also shed light on some fundamental issues in industrial organization and strategic management, such as why some firms are incentivized to coerce others to adopt certain practices. The answer might simply be that it makes economic sense because as corporate customers, they can benefit from increased sales throughout the supply chain. It is therefore unsurprising that these companies are also more responsive to product safety scandals, as these events are closely related to consumer perception and future purchases of their products. These are important strategic considerations for managers, especially pertaining to indirect costs and benefits incurred by other upstream and downstream firms, when trading off their social investment and other capital expenditures with limited corporate resources.

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Figure 1
A Snapshot of FactSet Revere Information on BMW and its Worldwide Suppliers

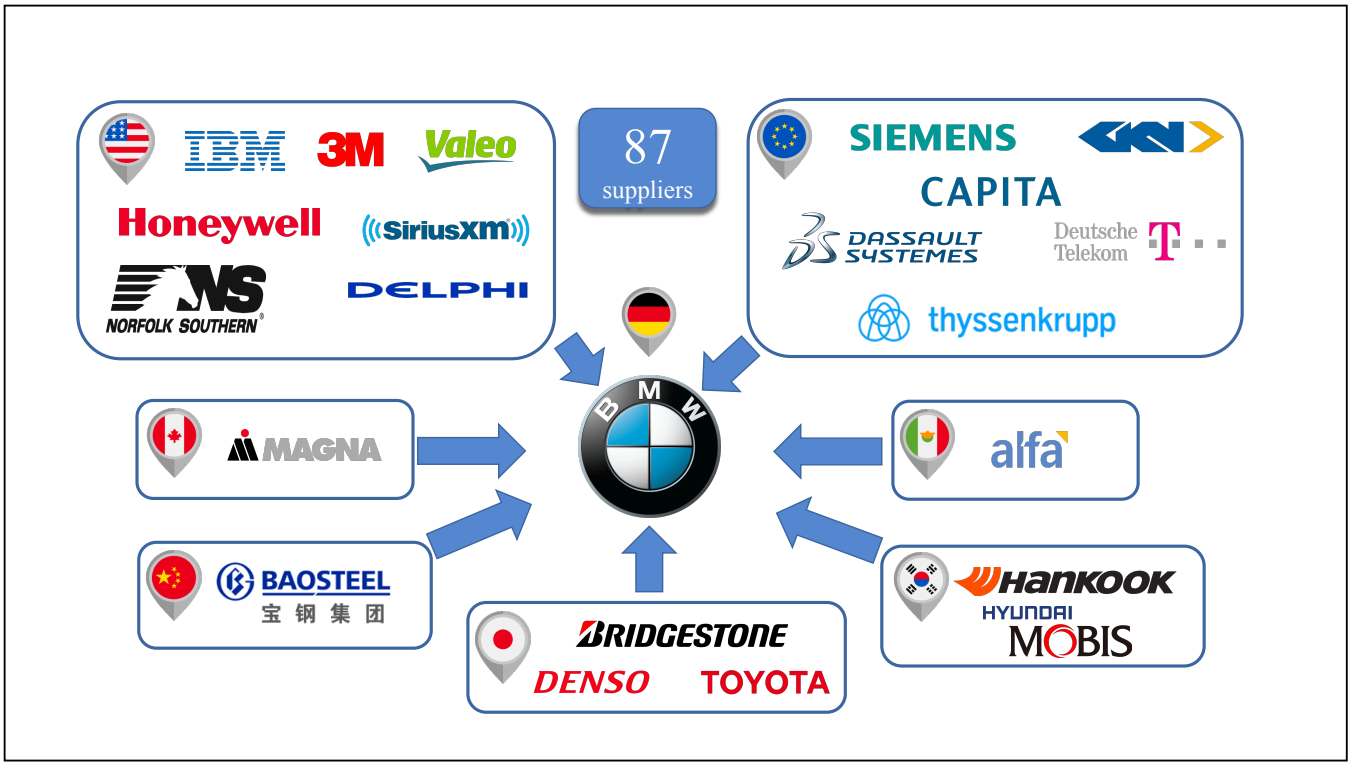

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Figure 2
Reputation Risk Indexes of Customers and Suppliers around ESG Scandal Announcement Periods

The figure shows plots of equal-weighted customer and supplier RepRisk indexes around month $t = 0$ when a supply-chain related ESG scandal broke. An equal-weighted supplier RepRisk index (RRI) is constructed by taking the average monthly RepRisk indexes of all suppliers that faced an ESG scandal. We adjust the average monthly RepRisk indexes 5 months prior to and following the month a scandal occurred, by subtracting the average mean computed over the past 12 months from $t - 17$ to $t - 6$ from the index level. We then repeat the procedure when constructing the supplier's customer's corresponding RepRisk index.

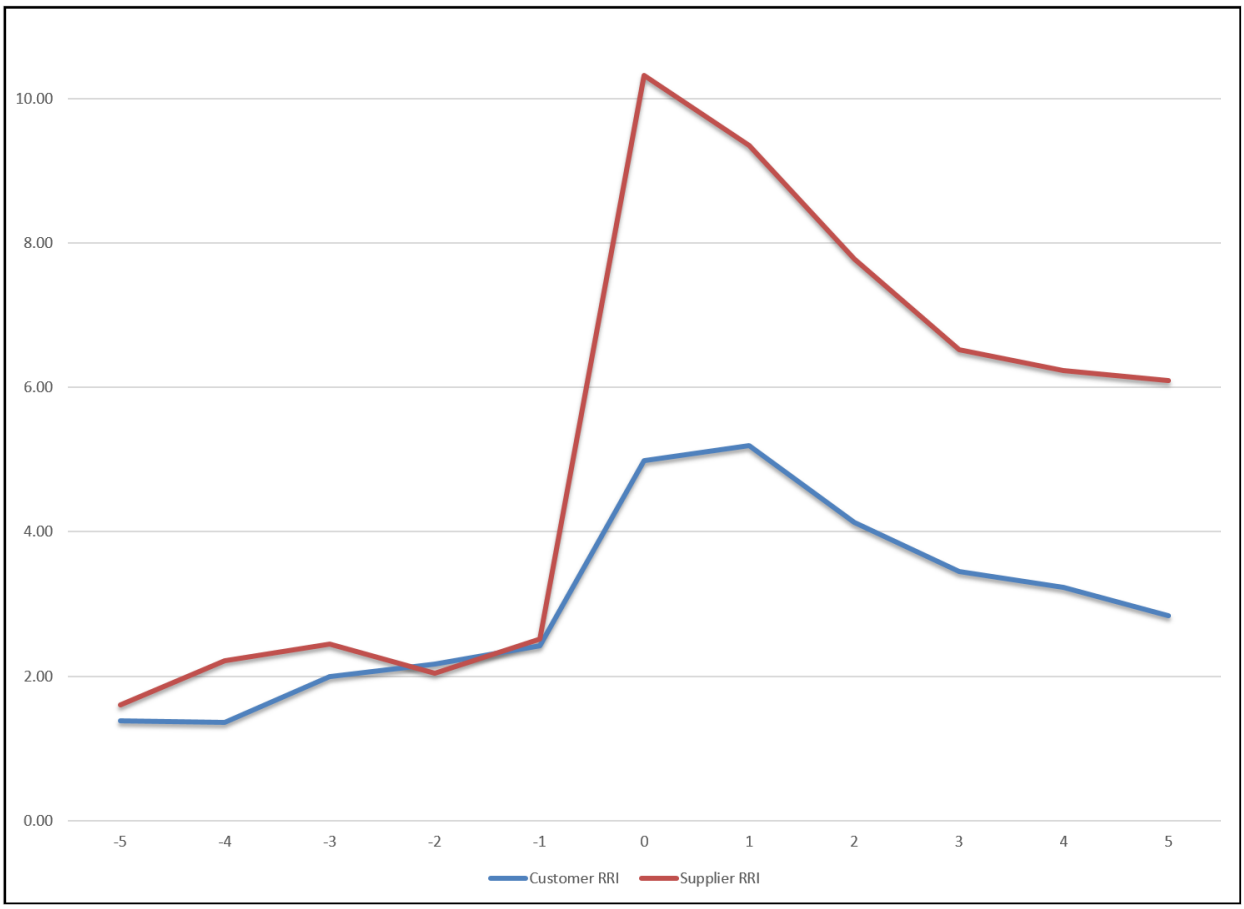

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Figure 3

Regression Discontinuity Plots of the Stakeholder Effect of CSR

The figure presents regression discontinuity and plots the average CSR score in year t+1 of corporate customers using a fitted quadratic polynomial estimate with a 95% confidence level. The x-axis is the distance (in percentage of votes) from the majority threshold by which a proposal can pass. The dots represent reactions of suppliers in terms of their CSR scores in the subsequent year. The figure is graphed based on 20 equally spaced bins (bandwidth being 5% of the vote shares), and the dashed lines represent their confidence intervals.

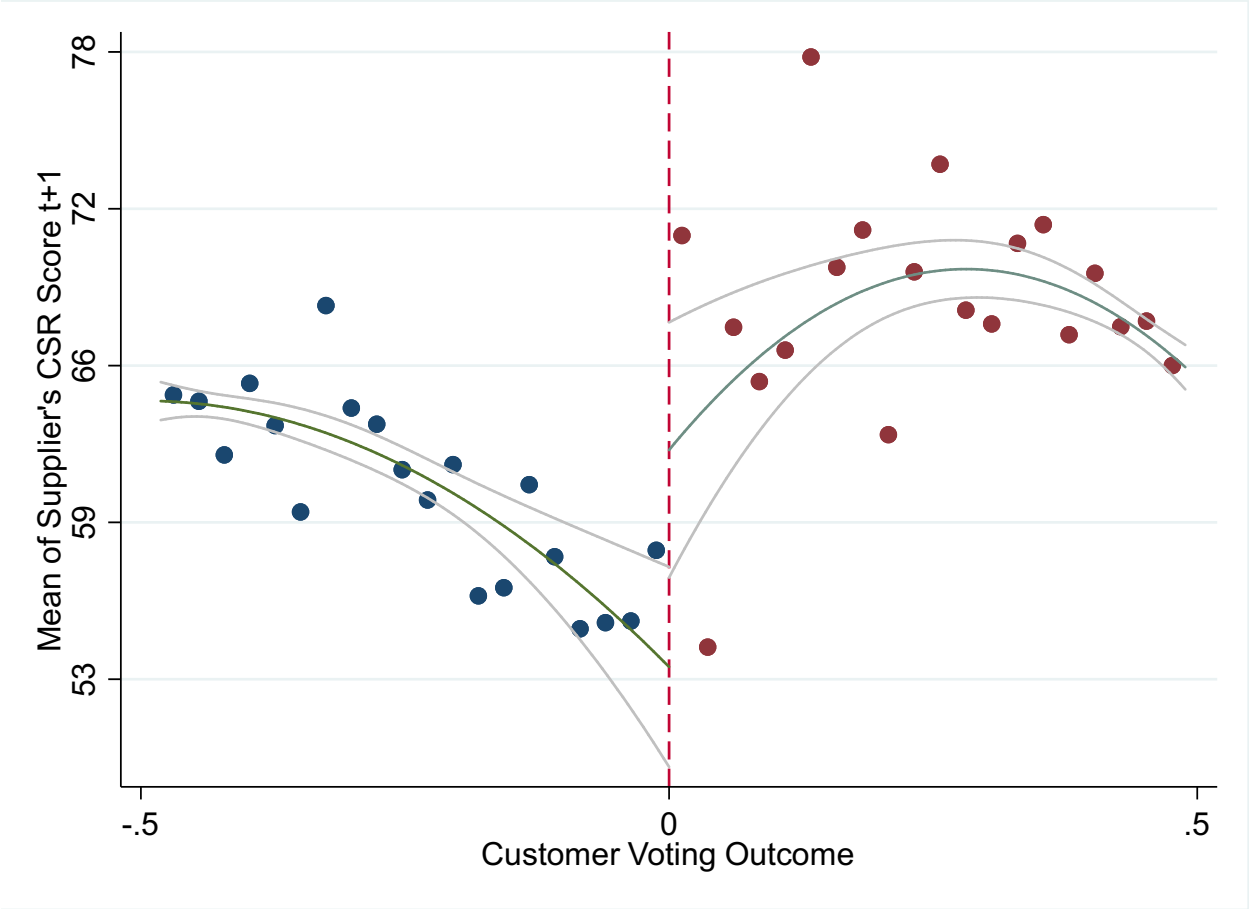

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Table 1

Summary Statistics

The table reports the number of customer-supplier pair observations (NObs) and summary statistics of various corporate social responsibility (CSR) scores, firm-level characteristics and GDP per capita employed as control variables, and the variables employed for the mechanisms of CSR propagation effects. These variables are reported for both suppliers and customers. The CSR variables are ratings associated with the composite CSR score, environmental (Env), social (Soc), and product responsibility CSR issues. Firm characteristics include leverage, return on assets (ROA), Tobin's Q (Q), log of total assets (ln(TAssets)), % of shares held by institutional investors and blockholders/insiders (Inst/Close Holdings), sales growth, as well as the country's log of gross domestic product per capita (ln(GDPC)). The channel variables include R&D, patents, Herfindahl-Hirschman Index (HHI), % of shares held by common institutional investors (%Shares ComInst), numbers of common owners (#ComInst)and directors in both customer and supplier firms , and # of common directors holding multiple board positions at the supplier. All the variables are defined in Appendix Table A.3.

	Variables associated with Suppliers								**Variables associated with Customers**							
Variable	NObs	Mean	Median	Stdev	Min	25th	75th	Max	NObs	Mean	Median	Stdev	Min	25th	75th	Max
CSR Composite and Component Scores																
CSR	55,694	63.74	73.88	29.09	2.91	37.77	90.49	98.45	55,694	71.60	83.09	26.51	2.53	56.23	92.55	98.49
Env	51,192	60.88	73.78	32.03	8.27	25.68	91.19	97.49	55694	69.20	86.27	30.24	8.27	45.11	92.72	97.50
Soc	51,192	59.98	67.71	30.14	3.54	31.68	88.05	98.80	55,694	68.73	79.82	27.17	3.54	50.64	90.65	98.88
Product	51,027	57.51	60.02	29.14	2.19	33.32	85.79	99.20	55,399	57.73	57.76	27.91	2.19	34.63	85.44	99.22
The Channel Variables																
R&D	35,501	0.05	0.03	0.05	0.00	0.01	0.08	0.18	32,892	0.03	0.02	0.04	0.00	0.00	0.05	0.14
Patents	1,364	249.62	12.00	572.10	1.00	2.00	52	2803	2,065	245.79	12.00	560.23	1.00	3.00	98	2803
HHI	55,691	0.18	0.08	0.22	0.01	0.04	0.23	1.00	52,553	0.22	0.11	0.25	0.01	0.05	0.30	1.00
%Shares ComInst	55,694	0.39	0.32	0.30	0.00	0.12	0.63	2.13	55,694	0.31	0.21	0.27	0.00	0.09	0.52	2.35
#ComInst	55,694	214.50	154	216.02	0.00	72	284	2210	55,694	214.50	154	216.02	0.00	72	284	2210
# of Common Directors	55,694	0.06	0.00	0.49	0.00	0.00	0.00	26.00	55,694	0.06	0.00	0.49	0.00	0.00	0.00	26.00
# of Board Positions	55,694	0.07	0.00	0.56	0.00	0.00	0.00	30.00	55,694	0.07	0.00	0.56	0.00	0.00	0.00	30.00
Control Variables																
Leverage	55,694	0.26	0.24	0.17	0.00	0.13	0.37	0.60	52,551	0.25	0.24	0.15	0.00	0.15	0.36	0.58
ROA	55,694	0.08	0.07	0.07	-0.10	0.04	0.12	0.21	52,201	0.08	0.07	0.07	-0.05	0.04	0.12	0.22
Q	55,694	1.80	1.52	0.88	0.86	1.16	2.15	4.27	52,551	1.61	1.35	0.71	0.89	1.08	1.89	3.58
MB	55,669	2.98	2.34	2.20	0.54	1.39	3.78	8.77	52,493	2.69	2.01	2.07	0.51	1.22	3.38	8.28
ln(TAssets)	55,694	22.94	22.78	1.57	14.87	21.89	23.97	28.86	52,551	24.13	24.15	1.57	15.63	23.03	25.30	28.96
Inst/Close Holdings	55,694	0.15	0.05	0.20	0.00	0.01	0.22	1.00	49,875	0.17	0.06	0.22	0.00	0.00	0.27	1.00
SalesGrowth	55,694	0.07	0.06	0.14	-0.16	-0.01	0.14	0.51	51,751	0.05	0.04	0.12	-0.15	-0.02	0.11	0.40
ln(GDPC)	55,694	10.76	10.79	9.47	6.90	10.66	10.91	11.69	55,029	10.72	10.78	9.58	6.90	10.63	10.87	11.69

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Table 2

Corporate Social Responsibility (CSR) Propagation along Global Supply Chains

This table reports results from the regression of supplier $\text{CSR}^S(t+1)$ Score on customer $\text{CSR}^C(t)$ Score, or from the regression of customer $\text{CSR}^C(t+1)$ Score on supplier $\text{CSR}^S(t)$ Score as follows.

$$\begin{aligned}
\text{CSR}^S \text{ Score}(t+1) &= a_0 + a_1 \text{CSR}^C(t) \text{ Score}(t) + \sum_{k=1}^{K} b_k \boldsymbol{X_k}(t) + \mathbf{FE}(t) + \epsilon(t+1). \\
\text{CSR}^C \text{ Score}(t+1) &= a_0 + a_1 \text{CSR}^S(t) \text{ Score}(t) + \sum_{k=1}^{K} b_k \boldsymbol{X_k}(t) + \mathbf{FE}(t) + \epsilon(t+1).
\end{aligned}$$

In columns (1)-(4), the dependent variable is supplier CSR Score and the key independent variable is customer CSR Score. Conversely, in columns (5)-(6), the dependent variable is customer CSR Score and the key independent variable is supplier CSR Score. In columns (7)-(8), the dependent variables, ΔCSR^S and ΔCSR^C, are defined as the change of supplier CSR and of customer CSR from t to $t+2$, respectively. Note that In column (4), we include all customer-supplier relationships with even less than two years of relationship, but for the other columns, we require that the customer-supplier link must exist for at least two years. Control variables $\boldsymbol{X}_k$ include firm-characteristics of the supplier, customer, or both. They are leverage, return on assets (ROA), Tobin's Q, log of total assets (ln(TAssets)), % of shares held by institutional investors and blockholders/insiders (Inst/Close Holdings), sales growth, as well as ln(GDPC). All the variables are defined in Appendix Table A.3. NObs is the number of firm-year customer-supplier pair observations. The regressions also include intercepts and combinations of different customer-supplier (CS) Firm fixed effects, as well as industry, country, and year fixed effects (**FE**), and all standard errors reported in parentheses are clustered at the customer-supplier-pair level. *, **, *** are significance levels denoted at the 10%, 5% and 1%, levels, respectively.

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Table 2 – Continued

Corporate Social Responsibility (CSR) Propagation along Global Supply Chains

	CSR^S				CSR^C		ΔCSR^S	ΔCSR^C
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
CSR$^C(t)$ Score	0.026**	0.031***	0.040***	0.038***			0.016**	
	(0.011)	(0.008)	(0.007)	(0.006)			(0.008)	
CSR$^S(t)$ Score					-0.002	-0.010		-0.008
					(0.008)	(0.008)		(0.007)
Leverage^S	-8.888***	-11.154***	-10.617***	-9.791***	-2.012		2.172	
	(1.717)	(1.341)	(1.249)	(1.073)	(1.409)		(1.515)	
ROA^S	32.886***	46.179***	46.159***	34.209***	-1.984		29.201***	
	(2.415)	(2.498)	(2.361)	(2.127)	(2.016)		(3.392)	
Q^S	0.454*	2.139***	2.150***	2.148***	0.185		-0.551*	
	(0.265)	(0.244)	(0.233)	(0.207)	(0.221)		(0.310)	
ln(TAssets)^S	4.014***	10.791***	10.697***	10.623***	-0.618		-1.644***	
	(0.545)	(0.142)	(0.131)	(0.110)	(0.452)		(0.147)	
Inst/Close Holdings^S	-9.853***	-20.219***	-20.031***	-17.094***	0.818		5.433***	
	(1.279)	(1.079)	(1.017)	(0.827)	(1.142)		(1.402)	
Sales Growth^S	2.838***	-23.046***	-22.555***	-17.802***	1.253		12.370***	
	(0.958)	(1.040)	(0.981)	(0.751)	(0.805)		(1.583)	
ln(GDPC)^S	14.479***	-1.810***	-1.476**	-0.238	1.123		-1.355	
	(2.000)	(0.613)	(0.576)	(0.482)	(1.604)		(0.834)	
Leverage^C	1.287	0.323			-18.200***	-8.840***		2.605*
	(2.178)	(1.298)			(1.734)	(1.781)		(1.518)
ROA^C	-1.111	-3.080			34.585***	39.558***		22.370***
	(3.207)	(3.113)			(2.579)	(2.398)		(3.721)
Q^C	-0.811**	0.588*			-0.935***	-0.921***		-2.358***
	(0.392)	(0.330)			(0.312)	(0.314)		(0.416)
ln(TAssets)^C	0.736	0.114			3.830***	2.363***		-2.091***
	(0.629)	(0.166)			(0.493)	(0.618)		(0.145)
Inst/Close Holdings^C	3.045*	0.296			-8.660***	-2.793**		5.171***
	(1.589)	(0.968)			(1.217)	(1.203)		(1.007)
Sales Growth^C	-0.052	-0.016			1.045	-0.851		11.053***
	(1.146)	(1.203)			(0.916)	(0.786)		(1.566)
ln(GDPC)^C	-0.786	0.719			7.130***	9.955***		-0.681
	(1.668)	(0.483)			(1.333)	(1.262)		(0.635)
NObs	32,633	32,633	37,540	54,968	24,015	27,345	13,240	12,911
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CS-Firm FE	Yes	No	No	No	Yes	No	No	No
CS-Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CS-Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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Table 3

Location and Country-Level CSR

This table reports results from the regression of supplier CSR score (CSR^S Score) on customer CSR score (CSR^C Score), where customers and suppliers are located in countries with high vs. low Vigeo sustainable country index, resided in the U.S., or in different countries. Countries with high sustainable country index are those that ranked above the median sustainable country index, and the remaining countries are considered low sustainable index countries.

$$\text{CSR}^S(t+1)\ \text{Score} = a_0 + a_1\text{CSR}^C(t)\ \text{Score} + \sum_{k=1}^{K} b_k \boldsymbol{X_k})(t) + \mathbf{FE}(t) + \epsilon(t+1).$$

Unreported control variables $\boldsymbol{X_k}$ include firm-characteristics of the supplier (S), and they are leverage, return on assets (ROA), Tobin's Q, log of total assets (ln(TAssets)), % of shares held by institutional investors and blockholders/insiders (Inst/Close Holdings), sales growth, as well as ln(GDPC). All the variables are defined in Appendix Table A.3. NObs is the number of customer-supplier pair observations. The regressions also include intercepts and customer-supplier (CS) pair industry, country, and year fixed effects (FE), and robust standard errors reported in parentheses are clustered at the customer-supplier-pair level. *, **, *** are significance levels denoted at the 10%, 5% and 1%, levels, respectively.

	High Customer-Country CSR		Low Customer-Country CSR			
	Supplier-Country CSR				US	Non-US
	Low	High	Low	High	Only	Countries
Variable	(1)	(2)	(3)	(4)	(5)	(6)
CSR^C	0.014	0.043***	0.013*	0.011	0.018*	0.036***
	(0.014)	(0.006)	(0.008)	(0.012)	(0.010)	(0.011)
NObs	11,820	13,787	27,987	8,223	18,311	15,312
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
CS-Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
CS-Country FE	Yes	Yes	Yes	Yes	Yes	Yes

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Table 4

Additional Tests

This table conducts a host of additional tests of CSR propagation along global supply chains. In Panel A, the key independent variables are the binary indicator which equals one if ($\text{CSR}^C > \text{CSR}^S$) and 0 otherwise, the differential CSR defined by $\text{CSR}^C - \text{CSR}^S$, and the interaction between the CSR gap and CSR^C. Panel B repeats columns (3)-(5) of Table 2 using two alternative CSR rating databases, namely MSCI IVA and SustainAnalytics (SAnalytics), while Panel C repeats the same based on ratings associated with environmental (Env) and social issues (Soc). Finally, Panel D conducts falsification tests, where we match a "false" supplier which is closest to the true supplier in terms of size, industry classification, and is the closest competitor to the true supplier ($S_{Industry}$). We construct another similar false supplier in terms of size and is the closest competitor to the true supplier from the same country ($S_{Country}$), . Across all panels, the estimations include control variables, leverage, return on assets (ROA), Tobin's Q, log of total assets (ln(TAssets)), % of shares held by institutional investors and blockholders/insiders (Inst/Close Holdings), sales growth, as well as ln(GDPC). All the variables are defined in Appendix Table A.3. NObs is the number of firm-year customer-supplier pair observations. The regressions also include intercepts and customer-supplier- (CS-) industry, country, and year fixed effects (**FE**), and all standard errors reported in parentheses are clustered at the customer-supplier-pair level. *, **, *** are significance levels denoted at the 10%, 5% and 1%, levels, respectively.

Panel A: Differential CSR Measures

Variable	$\text{CSR}^S(t+1)$	
CSR^C Score x I($\text{CSR}^C > \text{CSR}^S$)	0.121***	
	(0.916)	
CSR^C Score x ($\text{CSR}^C - \text{CSR}^S$)		0.016***
		(0.001)
$\text{CSR}^C - \text{CSR}^S$		-0.807***
		(0.458)
$\text{CSR}^C(t)$ Score	0.056***	0.804***
	(0.003)	(0.006)
NObs	48,283	48,283
Controls	Yes	Yes
Year FE	Yes	Yes
CS-Industry FE	Yes	Yes
CS-Country FE	Yes	Yes

Panel B: Alternative CSR Rating Databases

Variable	$\text{CSR}^S(t+1)$		$\text{CSR}^C(t+1)$	
IVA $\text{CSR}^C(t)$ Score	0.014**			
	(0.005)			
SAnalytics $\text{CSR}^C(t)$ Score		0.020***		
		(0.008)		
IVA $\text{CSR}^S(t)$ Score			0.010	
			(0.006)	
SAnalytics $\text{CSR}^S(t)$ Score				-0.002
				(0.008)
NObs	28,056	22,173	23,600	20,805
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
CS-Industry FE	Yes	Yes	Yes	Yes
CS-Country FE	Yes	Yes	Yes	Yes

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Table 4

Additional Tests – Continued

Panel C: Environmental and Social Ratings				
Variable	$\text{CSR}^S(t+1)$		$\text{CSR}^C(t+1)$	
$\text{Env}^C(t)$	0.032***			
	(0.006)			
$\text{Soc}^C(t)$		0.013**		
		(0.005)		
$\text{Env}^S(t)$			-0.005	
			(0.005)	
$\text{Soc}^S(t)$				-0.003
				(0.005)
NObs	55,685	55,685	51,115	51,115
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
CS-Industry FE	Yes	Yes	Yes	Yes
CS-Country FE	Yes	Yes	Yes	Yes

Panel D: Falsification Tests		
Variable	$\text{CSR}^{S_{Industry}}(t+1)$	$\text{CSR}^{S_{Country}}(t+1)$
$\text{CSR}^C(t)$ Score	-0.011	-0.010
	(-1.170)	(-0.931)
NObs	30,998	26,349
Controls	Yes	Yes
Year FE	Yes	Yes
CS-Industry FE	Yes	Yes
CS-Country FE	Yes	Yes

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Table 5

Supplier Responses to the Passage of a CSR Proposal and Subsequent CSR Implementation

Panel A of this table reports pre-voting differences in the set of observable supplier firm-specific characteristics, namely leverage, return on assets (ROA), Tobin's Q, log of total assets (ln(TAssets)), % of shares held by institutional investors and blockholders/insiders (Inst/Close Holdings), sales growth, as well as ln(GDPC) between supplier firms that are associated with the passage ("Pass" Suppliers) of a CSR proposal in customer firms and those that are associated with the rejection ("Fail" Suppliers) of a CSR proposal in customer firms by a small margin. The margin is defined as the optimal bandwidth following Imbens and Kalyanaraman (2012). Panel B presents the supplier's future CSR performance ($\text{CSR}^S(t+1)$ Score) in response to the customer's CSR votes. It reports RDD estimations from a local linear regression as specified in the model below using the optimal bandwidth.

$$\text{CSR}^S(t+1)\ \text{Score} = a_0 + a_1\text{Pass}(t) + a_2\%\text{Votes For CSR Proposal} + \epsilon(t+1).$$

where $\text{CSR}^S(t+1)$ Score is the supplier CSR score in year t+1; Pass is a binary indicator that equals 1 if the supplier's corporate customer passes a CSR-related proposal – that is, if more than a certain specified number of votes are in favor of adopting the CSR proposal and 0 otherwise; and %Votes For CSR Proposal is the percentage of vote shares in favor of the CSR proposal, centered at the threshold (a level specified by the firm and it varies across firms and countries). a_1 captures the discontinuity at the majority threshold – the difference in outcome between customers that marginally pass a CSR proposal and those that marginally reject a CSR proposal. Δ CSR measures the difference in CSR between $t-1$ and $t+1$. Panel C presents supplier firms' future CSR implementation as a response to the CSR votes estimated using a fuzzy RDD approach. We use three definitions of a CSR implementation, namely (1) there is news or information that the proposal has been implemented; (2) an increase of more than 10 points in the ASSET4 score; (3) Board recommending "For" to the proposal before the vote, as this is ex ante observable at the time of the vote and increases the likelihood of the customer firm actually implementing the proposal. The first stage of fuzzy RDD is to estimate the probability of implementation at a firm's specific cutoff. If there is a significant jump in the probability of implementation, we perform the second stage to obtain the estimate, adjusting for imperfect compliance. Panel D presents supplier firms' future CSR performance conditional on the compliance or implementation of the CSR proposals in the voting customer firms. We compare the CSR scores of the supplier firms in response to the compliance of the passed CSR proposals. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Validity for CSR Vote (Preexisting Difference)

	Fail		Pass		Difference (Fail-Pass)		Difference in Narrow Margin (Optimal Band Width)	
	NObs	Mean	NObs	Mean	Estimate	P-value	Estimate	P-value
Leverage^S	20,068	0.263	13,424	0.249	0.014	0.000	0.016	0.637
ROA^S	20,068	0.08	13,424	0.073	0.007	0.000	0.001	0.945
Q^S	20,068	1.784	13,424	1.798	-0.014	0.136	-0.069	0.265
ln(TAssets)^S	20,068	22.808	13,424	23.065	-0.257	0.000	-0.092	0.747
Inst/Close Holdings	20,068	0.144	13,424	0.151	-0.007	0.002	-0.019	0.655
Sales Growth^S	20,068	8.731	13,424	6.805	1.926	0.000	-0.947	0.752
ln(GDPC)^S	20,068	10.714	13,424	10.677	0.037	0.000	-0.137	0.165

Panel B: Supplier Reactions to the Passage of CSR Vote

	Optimal Bandwidth	50% of Optimal Bandwidth	150% of Optimal Bandwidth	ΔCSR Variable Optimal Bandwidth
Pass	6.988***	7.149*	10.742***	4.461**
$t-$stat	(3.42)	(1.83)	(8.44)	(4.85)
NObs	4,180	802	12,818	2,169

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Table 5 – Continued

Supplier Responses to the Passage of a CSR Proposal and Subsequent Implementation

Panel C: Supplier Responses to the Passage of a Customer's CSR Proposal: A Fuzzy RDD Approach

	News about Implementation		Increase in ASSET4 Ratings		Board Recommending "For"	
	First Stage	Second Stage	First Stage	Second Stage	First Stage	Second Stage
	(1)	(2)	(3)	(4)	(5)	(6)
Estimate	0.386***	32.857***	0.239***	36.309***	0.793***	15.995***
$t-$statistic	(34.87)	(7.87)	(13.11)	(2.94)	(102.36)	(8.16)

Panel D: Supplier Responses to Implementation and Nonimplementation of CSR

	News about Implementation		Increase in ASSET4 Ratings		Board Recommending "For"	
	Implementation	Nonimplementation	Implementation	Nonimplementation	Implementation	Nonimplementation
	(1)	(2)	(3)	(4)	(5)	(6)
Supplier CSR Score	69.272	63.495	60.276	59.760	68.856	61.031
Difference	5.778*		0.516		3.990**	
$t-$statistic	(1.83)		(0.11)		(1.97)	

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Table 6

Product Safety Scandals and Reputation Risk

This table tests the effect of product safety scandals on CSR propagation along the supply chain using the following two models.

$$\begin{aligned}
\text{CSR}^S \text{ Product Score}(t+1) &= a_0 + a_1 \text{CSR}^C \text{ Product Score}(t) \times \text{Event} + a_2 \text{CSR}^C \text{ Product Score}(t) + a_3 \text{Event} \\
&\quad + \sum_{k=1}^{K} b_k \boldsymbol{X_k}(t) + \mathbf{FE}(t) + \epsilon(t+1). \\
\text{RepRisk}^C(t+1) &= a_0 + a_1 \text{RepRisk}^S(t) \times \text{Month} + a_2 \text{RepRisk}^S(t) + a_3 \text{Month} \\
&\quad + \sum_{k=1}^{K} b_k \boldsymbol{X_k}(t) + \mathbf{FE}(t) + \epsilon(t+1).
\end{aligned}$$

In the first model, we regress the supplier's product responsibility rating (Product Score) on its customer's counterpart, the event year (Event; i.e., the 2008 food safety scandal in China and the 2013 Takata airbag and Toyota car recalls), and the interaction between Event and customer CSR Product Score. In the second model, we regress the customer's reputation risk index (RepRisk) on its supplier's counterpart associated with the product safety scandals, Month (i.e., the month of the year when the scandal was announced), and the interaction between Month and RepRisk. Unreported control variables $\boldsymbol{X_k}$ include the supplier's leverage, return on assets (ROA), Tobin's Q, log of total assets (ln(TAssets)), % of shares held by institutional investors and blockholders/insiders (Inst/Close Holdings), sales growth, and ln(GDPC). All the variables are defined in Appendix Table A.3. NObs is the number of customer-supplier (CS) pair observations. In columns (1)-(2), the frequency is annually, whereas in columns (3)-(4), the frequency is monthly. All regressions also include intercepts and CS-industry, CS-country, and year fixed effects (FE), and robust standard errors reported in parentheses are clustered at the customer-supplier-pair level. *, **, *** are significance levels denoted at the 10%, 5% and 1%, levels, respectively.

	$\text{CSR}^S(t+1)$		$\text{RepRisk}^C(t+1)$	
	Food Safety Scandal	Airbag & Car Recalls	Food Safety Scandal	Airbag & Car Recalls
Variable	(1)	(2)	(3)	(4)
Product Responsibility^C x 2008	0.250*			
	(0.145)			
Product Responsibility^C x 2013		0.268**		
		(0.122)		
Product Responsibility^C	-0.026	-0.082		
	(0.057)	(0.076)		
RepRisk^S x Aug 2008			0.080**	
			(0.036)	
RepRisk^S x April 2013				0.112***
				(0.018)
RepRisk^S			0.016	-0.072***
			(0.012)	(0.011)
NObs (CS-Years)	753	423		
NObs (CS-Months)			32,821	88,653
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
CS-Industry FE	Yes	Yes	Yes	Yes
CS-Country FE	Yes	Yes	Yes	Yes

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Table 7

Linked and Delinked Customer-Supplier Relationships

This table reports results from the regression of supplier CSR score on customer CSR score, linked/delinked indicator, and their interaction as follows.

$$\begin{aligned}\text{CSR}^S\ \text{Score}(t+1) &= a_0 + a_1\text{CSR}^C\ \text{Score}(t) \times \text{Post Link/Delink}(t) + a_2\text{CSR}^C\ \text{Score}(t) \\ &\quad + a_3\text{Post Link/Delink}(t) + \sum_{k=1}^{K} b_k \boldsymbol{X_k}(t) + \mathbf{FE}(t) + \epsilon(t+1).\end{aligned}$$

The dependent variable is supplier CSR score (CSR^S Score) and the key independent variables are the customer CSR score (CSR^C Score), Post Link/Delink variable, and their interaction. Post Link (Delink) is a binary variable that equals 1 if the customer and supplier first establishes (severes) the relationship and 0 otherwise. Unreported control variables $\boldsymbol{X_k}$ include supplier firm-characteristics, namely leverage, return on assets (ROA), Tobin's Q, log of total assets (ln(TAssets)), % of shares held by institutional investors and blockholders/insiders (Inst/Close Holdings), sales growth, as well as country's gross domestic product per capita (ln(GDPC)). All the variables are defined in Appendix Table A.3. NObs is the number of customer-supplier pair observations. The regressions also include intercepts and customer-supplier (CS) industry, country, and year fixed effects (FE), and robust standard errors reported in parentheses are clustered at the customer-supplier level. *, **, *** are significance levels denoted at the 10%, 5% and 1%, levels, respectively.

Variable	(1)	(2)
CSR^C Score x Post Link	0.020***	
	(0.004)	
Post Link	0.209	
	(0.275)	
CSR^C Score x Post Delink		0.001
		(0.004)
Post Delink		0.808***
		(0.296)
CSR^C Score	-0.007*	0.001
	(0.003)	(0.003)
NObs	233,881	233,881
Controls	Yes	Yes
Year FE	Yes	Yes
CS-Industry FE	Yes	Yes
CS-Country FE	Yes	Yes

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Table 8

Stakeholder Effects of CSR in Target Supplier and Customer Firms

This table reports results from the regression of supplier CSR score on customer CSR score, binary indicator for post-M&A event of either a customer or a supplier being the target firm, and the interaction between post-M&A indicator (Post M&A) and customer CSR score as follows.

$$\begin{aligned}\text{CSR}^S\ \text{Score}(t+1) \quad = \quad & a_0 + a_1\text{CSR}^C\ \text{Score}(t) \times \text{Post M\&A}^{\ S\ \text{or}\ C}(t) + a_2\text{CSR}^C\ \text{Score}(t) + a_3\text{Post M\&A}^{\ S\ \text{or}\ C}(t) \\ & + \sum_{k=1}^{K} b_k \boldsymbol{X_k}(t) + \mathbf{FE}(t) + \epsilon(t+1).\end{aligned}$$

The dependent variable is supplier CSR score (CSR^S Score) and the key independent variables are customer CSR score (CSR^C Score) and its interaction with the Post M&A indicator when a customer or a supplier is the target. The table also shows results when evaluating a customer whose CSR is above the median rating (CSR^C_{High}) in the sample of customer firms. Unreported control variables $\boldsymbol{X_k}$ include supplier firm-characteristics, namely leverage, return on assets (ROA), Tobin's Q, log of total assets (ln(TAssets)), % of shares held by institutional investors and blockholders/insiders (Inst/Close Holdings), sales growth, as well as its country's gross domestic product per capita (ln(GDPC)). All the variables are defined in Appendix Table A.3. NObs is the number of customer-supplier (CS) pair observations. The regressions also include intercepts and customer-supplier (CS) industry, country, and year fixed effects (FE), and robust standard errors reported in parentheses are clustered at the customer-supplier-pair level. *, **, *** are significance levels denoted at the 10%, 5% and 1%, levels, respectively.

	Target=Supplier/Customer		Target=Supplier		Target=Customer	
Variable	(1)	(2)	(3)	(4)	(5)	(6)
CSR^C Score x Post M&A	-0.051**		-0.075**		-0.028	
	(0.023)		(0.032)		(0.032)	
CSR^C Score	0.013**		0.013**		0.012**	
	(0.006)		(0.006)		(0.006)	
CSR^C_{High} x Post M&A		-1.595*		-2.307**		-0.038
		(0.896)		(1.153)		(1.419)
CSR^C_{High}		0.382*		0.372*		0.336
		(0.219)		(0.218)		(0.218)
Post M&A	4.492**	1.514*	7.894***	3.381***	1.603	-0.504
	(1.860)	(0.830)	(2.482)	(1.044)	(2.639)	(1.308)
NObs	52,555	52,555	52,555	52,555	52,555	52,555
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
CS-Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
CS-Country FE	Yes	Yes	Yes	Yes	Yes	Yes

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Table 9

The Effect of Bargaining Power in the Supply Chain and Supplier CSR

This table reports results from the regression of supplier CSR score (CSR^S Score) on customer CSR score (CSR^C Score), a measure of the bargaining power (Power) in the customer-supplier relationship, and the interaction between Power and CSR^C Score as follows.

$$\begin{aligned}\text{CSR}^S\ \text{Score}(t+1) &= a_0 + a_1\text{CSR}^C\ \text{Score}(t) \times \text{Power}(t) + a_2\text{CSR}^C\ \text{Score}(t) + a_3\text{Power}(t) \\ &\quad + \sum_{k=1}^{K} b_k \boldsymbol{X_k}(t) + \mathbf{FE}(t) + \epsilon(t+1).\end{aligned}$$

Our analysis examines the degree of bargaining power in a supply chain through the supplier's level of innovation, measured by its R&D to total assets and the log of the number of patents, in columns (1)-(2), and the industry competitiveness of suppliers and customers, as measured by the Herfindahl-Hirschman Index (HHI), in columns (3)-(4). The key independent variables are CSR^C Score, the proxy for Power, and their interaction. Unreported control variables $\boldsymbol{X_k}$ include supplier firm-characteristics, namely leverage, return on assets (ROA), Tobin's Q, log of total assets (ln(TAssets)), % of shares held by institutional investors and blockholders/insiders (Inst/Close Holdings), sales growth, as well as country's gross domestic product per capita (ln(GDPC)). All the variables are defined in Appendix Table A.3. NObs is the number of customer-supplier (CS) pair observations. The regressions also include intercepts, CS-industry, CS-country, and year fixed effects (FE), and robust standard errors reported in parentheses are clustered at the customer-supplier-pair level. *, **, *** are significance levels denoted at the 10%, 5% and 1%, levels, respectively.

Variable	(1)	(2)	(3)	(4)
CSR^C Score x $\text{R\&D}^S$	-0.323***			
	(0.114)			
$\text{R\&D}^S$	65.482***			
	(9.280)			
CSR^C Score x Patents^S		-0.013*		
		(0.008)		
Patents^S		0.795		
		(0.737)		
CSR^C Score x HHI^S			-0.567***	
			(0.191)	
HHI^S			32.811**	
			(13.939)	
CSR^C Score x HHI^C				0.048**
				(0.023)
HHI^C				-4.235**
				(2.004)
CSR^C Score	0.037***	0.042	0.034***	0.010
	(0.009)	(0.042)	(0.007)	(0.007)
NObs	35,493	1,364	55,682	52,552
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
CS-Industry FE	Yes	Yes	Yes	Yes
CS-Country FE	Yes	Yes	Yes	Yes

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Table 10

Common Institutional Ownership and Supplier CSR

This table reports results from the regression of supplier CSR score on customer CSR score, common institutional ownership (ComInst), and the interaction between ComInst and customer CSR score as follows.

$$\text{CSR}^S\ \text{Score}(t+1) \quad = \quad a_0 + a_1\text{CSR}^C\ \text{Score}(t) \times \text{ComInst}^{S\ \text{or}\ C}(t) + a_2\text{CSR}^C\ \text{Score}(t) + a_3\text{ComInst}^{S\ \text{or}\ C}(t) + \sum_{k=1}^{K} b_k \boldsymbol{X_k}(t) + \mathbf{FE}(t) + \epsilon(t+1).$$

The dependent variable is supplier CSR score (CSR^S Score) and the key independent variables are the customer CSR score (CSR^C Score) and common ownership variable. ComInst is measured using the percentage of shares held by common institutional investors in a supplier or customer firm (%Shares ComInst), or the log number of institutional investors holding both the supplier and customer firms (#ComInst). In columns (1)-(3), the estimates include all existing common ownership in both supplier and customer firms. In columns (4)-(5), the specifications only consider institutional owners of a customer and then owns stocks of its supplier for the first time. Unreported control variables $\boldsymbol{X_k}$ include supplier firm-characteristics, namely leverage, return on assets (ROA), Tobin's Q, log of total assets (ln(TAssets)), % of shares held by institutional investors and blockholders/insiders (Inst/Close Holdings), sales growth, as well as country's gross domestic product per capita (ln(GDPC)). All the variables are defined in Appendix Table A.3. NObs is the number of customer-supplier (CS) pair observations. The regressions also include intercepts, CS-industry, CS-country, and year fixed effects (FE), and robust standard errors reported in parentheses are clustered at the customer-supplier-pair level. *, **, *** are significance levels denoted at the 10%, 5% and 1%, levels, respectively.

	Existing Cross-Holdings			First-time Holdings	
Variable	(1)	(2)	(3)	(4)	(5)
CSR^C Score x %Shares ComInst^S	0.033**			0.383***	
	(0.015)			(0.117)	
%Shares ComInst^S	3.421***			-1.205	
	(1.244)			(6.702)	
CSR^C Score x %Shares ComInst^C		0.035**			
		(0.014)			
%Shares ComInst^C		4.160***			
		(1.078)			
CSR^C Score x #ComInst			0.068***		0.033*
			(0.024)		(0.017)
#ComInst			0.040**		5.341***
			(0.018)		(1.297)
CSR^C Score	-0.010	-0.004	-0.026	0.038***	0.027***
	(0.008)	(0.008)	(0.018)	(0.006)	(0.009)
	(0.008)	(0.008)	(0.018)		
NObs	52,555	52,555	55,685	51,745	51,745
Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
CS-Industry FE	Yes	Yes	Yes	Yes	Yes
CS-Country FE	Yes	Yes	Yes	Yes	Yes

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Table 11

Common Directors and Supplier CSR

This table reports results from the regression of supplier CSR score on customer CSR score, common directors (CDirectors), and the interaction between CDirectors and customer CSR score as follows.

$$\begin{aligned}\text{CSR}^S\ \text{Score}(t+1) &= a_0 + a_1\text{CSR}^C\ \text{Score}(t) \times \text{CDirectors}(t) + a_2\text{CSR}^C\ \text{Score}(t) \\ &\quad + a_3\text{CDirectors}(t) + \sum_{k=1}^{K} b_k \boldsymbol{X_k}(t) + \mathbf{FE}(t) + \epsilon(t+1).\end{aligned}$$

The dependent variable is supplier CSR score (CSR^S Score) and the key independent variables are the customer CSR score (CSR^C Score), CDirectors variable, and their interaction. CDirectors is measured using the log number of directors who serve on the boards of both the supplier and the customer, or the log number of common directors holding multiple positions in the supplier firm. Columns (1)-(2) look at the sample of directors who already have positions in both the supplier and customer firms. Column (3) tests the effect of a board member from the customer who later serves the supplier board for the first time. Unreported control variables $\boldsymbol{X_k}$ include supplier firm-characteristics, namely leverage, return on assets (ROA), Tobin's Q, log of total assets (ln(TAssets)), % of shares held by institutional investors and blockholders/insiders (Inst/Close Holdings), sales growth, as well as country's gross domestic product per capita (ln(GDPC)). All the variables are defined in Appendix Table A.3. NObs is the number of customer-supplier (CS) pair observations. The regressions also include intercepts, CS-industry, CS-country, and year fixed effects (FE), and robust standard errors reported in parentheses are clustered at the customer-supplier-pair level. *, **, *** are significance levels denoted at the 10%, 5% and 1%, levels, respectively.

	Existing Appointments		First-time Appointment
Variable	(1)	(2)	(3)
CSR^C Score x # of Common Directors	0.035***		0.095***
	(0.010)		(0.029)
# of Common Directors	-2.453***		-6.356***
	(0.687)		(2.335)
CSR^C Scorex # of Board Positions		0.028***	
		(0.008)	
# of Common Positions		-1.989***	
		(0.569)	
CSR^C Score	0.036***	0.036***	0.035***
	(0.006)	(0.006)	(0.006)
NObs	55,642	55,642	55,642
Controls	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
CS-Industry FE	Yes	Yes	Yes
CS-Country FE	Yes	Yes	Yes

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Table 12

Firm Performance and Customer Effects of CSR

This table reports results from regressing firm performance, measured by SG&A, 3-year annualized sales growth, and firm valuation on supplier CSR Score, customer CSR Score, and the interaction between customer CSR Score and supplier CSR Score as follows.

$$\text{Performance}^{\,S \text{ or } C}(t+1) \quad = \quad a_0 + a_1 \text{CSR}^C \text{ Score}(t-1) \times \text{CSR}^S \text{ Score}(t) + a_2 \text{CSR}^C \text{ Score}(t-1) + a_3 \text{CSR}^S \text{ Score}(t) + \sum_{k=1}^{K} b_k \boldsymbol{X_k}(t) + \mathbf{FE}(t) + \epsilon(t+1).$$

The dependent variable is the supplier's performance (Performance) in columns (1), (3), and (5), and of customer's in (2), (4), and (6), and key explanatory variables include supplier CSR score (CSR^S Score), customer CSR score (CSR^C Score) and their interaction. Performance is measured by SG&A, 3-year annualized sales growth, and market-to-book equity value. Unreported control variables $\boldsymbol{X_k}$ include supplier firm-characteristics, namely leverage, return on assets (ROA), Tobin's Q, total assets (ln(TAssets)), % of shares held by institutional investors and blockholders/insiders (Inst/Close Holdings), sales growth, as well as the country's gross domestic product per capita (ln(GDPC)). All the variables are defined in Appendix Table A.3. NObs is the number of customer-supplier (CS) pair observations. The regressions also include intercepts, CS-industry, country, and year fixed effects (FE), and robust standard errors reported in parentheses are clustered at the customer-supplier-pair level. *, **, *** are significance levels denoted at the 10%, 5% and 1%, levels, respectively.

	SG&A		3-Year Annualized Sales Growth		Market-to-Book Value	
	Supplier	Customer	**Supplier**	Customer	Supplier	Customer
Variable	(1)	(2)	(3)	(4)	(5)	(6)
CSR^C*CSR^S	-0.0003***	-0.0003***	0.021	0.029*	0.004**	0.0003*
	(0.0000)	(0.0000)	(0.149)	(0.017)	(0.001)	(0.0001)
CSR^S	0.0548***	0.0257***	0.006	0.025	0.270**	-0.065***
	(0.00747)	(0.00868)	(0.122)	(0.015)	(0.121)	(0.013)
CSR^C	0.0235***	0.0341***	0.340***	-0.021*	-0.211*	-0.014
	(0.00771)	(0.00720)	(0.108)	(0.012)	(0.109)	(0.014)
NObs	31,232	28,238	32,242	32,244	33,202	32,242
Supplier Controls	Yes	No	Yes	No	Yes	No
Customer Controls	No	Yes	No	Yes	No	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
CS-Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
CS-Country FE	Yes	Yes	Yes	Yes	Yes	Yes

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Appendix Table A.1

Distribution of the numbers of customers and suppliers, together with their mean CSR scores, by year.

This table shows numbers of suppliers and customers, as well as their average CSR scores (CSR^S and CSR^C), respectively, by year.

	Number of		**Average**	
	Suppliers	**Customers**	**CSR^S Score**	**CSR^C Score**
Year	(1)	(2)	(3)	(4)
2003	1,427	1,410	52.69	62.83
2004	2,125	2,097	58.86	71.69
2005	2,425	2,396	62.40	74.90
2006	2,538	2,523	60.31	75.17
2007	2,707	2,675	63.66	75.14
2008	3,446	3,351	62.59	72.91
2009	4,690	4,551	61.17	72.20
2010	6,772	6,534	66.06	73.52
2011	9,622	9,241	67.43	74.78
2012	9,402	9,961	66.94	75.12
2013	11,261	10,366	65.02	74.28
2014	11,271	10,492	65.52	73.43
2015	14,427	13,227	62.17	75.25

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Appendix Table A.2

Distribution of numbers of customers and suppliers, together with their mean CSR scores by country.

This table shows the numbers of suppliers and customers, as well as their average CSR (CSR^S and CSR^C, respectively) scores, by year.

	Number of		Average	
	Suppliers	Customers	CSR^S Score	CSR^C Score
Country	(1)	(2)	(3)	(4)
Australia	1,580	2,195	81.30	63.05
Austria	115	186	69.63	62.97
Belgium	178	193	76.61	72.43
Bermuda	107	303	21.95	22.40
Brazil	1,338	768	70.17	59.98
Canada	2,450	3,195	75.20	57.79
Chile	458	293	38.64	34.32
China	874	469	50.11	41.04
Colombia	61	18	80.45	74.22
Czech Republic	19	4	45.02	49.64
Denmark	246	238	75.24	72.71
Egypt	6	2	4.86	5.46
Finland	437	760	90.39	90.99
France	3,857	4,500	88.55	83.90
Germany	3,622	3,061	82.36	73.41
Greece	104	45	77.83	45.13
Hong Kong	871	639	60.75	62.45
Hungary	35	12	50.62	56.90
India	713	398	76.58	74.54
Indonesia	348	244	58.05	58.63
Ireland	215	261	62.43	64.56
Israel	274	185	38.98	56.75
Italy	811	503	82.80	88.58
Japan	5,786	3,997	70.73	67.26
Kuwait	10	2	75.13	24.99
Luxembourg	346	219	80.14	66.48
Malaysia	174	225	62.56	46.07
Mexico	298	288	40.02	43.98
Morocco	3	5	26.38	26.38
Netherlands	1,665	1,224	88.33	79.34
New Zealand	135	113	59.06	26.50
Norway	435	287	89.01	82.95
Peru	43	19	22.07	35.90
Philippines	101	61	49.10	47.32
Poland	172	267	46.75	26.23
Portugal	162	39	86.15	87.05
Qatar	13	5	7.12	9.45
Russia	554	434	51.06	51.25
Saudi Arabia	62	52	62.64	73.71
Singapore	329	678	65.80	58.92
South Africa	591	651	82.01	67.96
South Korea	2,235	1,903	68.35	64.44
Spain	799	630	90.64	87.32
Sweden	693	1,052	86.36	80.74
Switzerland	956	1,300	86.53	64.85
Thailand	197	170	81.07	83.93
Turkey	163	84	56.83	49.62
United Arab Emirates	4	3	20.00	15.38
United Kingdom	5,632	6,192	87.58	78.67
United States of America	38,546	43,741	71.13	59.12

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Appendix Table A.3

Variable Definition and Data Source

Variable	**Definition and Data Source**
CSR Component Scores and RepRisk Index	
CSR Score	An equal weighted CSR rating score (ASSET4)
Env	A score associated with the environmental pillar of CSR Rating (ASSET4)
Soc	A score associated with the social responsible pillar of CSR Rating (ASSET4)
Product	A score associated with the product responsibility pillar of CSR Rating (ASSET4)
RepRisk Index	A firm-level reputation risk index that assesses a firm's risk exposure to ESG issues (RepRisk)
Mechanism Variables	
R&D	Research and Development Expense (Worldscope item 01201)/Total assets (Worldscope item 02999)
Patents	Natural logarithm value of number of successful patent applications filed plus one in a year (PATSTAT)
HHI	Herfindahl-Hirschman Index measured by the summation of squared market share (base on sales) of each firm within the same industry)(Datastream Worldscope)
%Shares ComInst	The maximum % of ownership held by all common institutional owners in the supplier (or customer) in a given year (FactSet Global Ownership Data)
#ComInst	# of common owners who own shares of both the supplier and customer in a given year (FactSet Global Ownership Data)
# of Common Directors	# of common directors who serve on the boards of both the supplier and customer in a given year (BoardEx)
# of Board Positions	# of board positions held by common directors at the supplier in a given year (BoardEx)
Control Variables	
Leverage	Book Value of Debt (WorldScope item 03255) / Total assets (Worldscope item 02999)
ROA	Earnings before Interest and Taxes (Worldscope item 18191)/Total assets (Worldscope item 02999)
Q	Market value of common equity (Worldscope Item 08001) + Total assets (Worldscope Item 02999) - Book value of common equity (Worldscope item 03501) and then divided by the net value by Total assets (Worldscope item 02999)
ln(TAssets)	Natural logarithm value of total assets (Worldscope item 02999) plus one
Inst/Close Holdings	Percentage of outstanding shares owned by institutional investors and blockholders/insiders (Worldscope item 08021 + Factset Global Ownership data)
Sales Growth	One year net sales growth (Worldscope item 08631)
ln(GDPC)	Log of gross domestic product in USD divided by domestic population (World Bank Indicators)
Performance Variables	
SG&A	Selling, general and administrative expenses (Worldscope item 01101) divided by total assets (Worldscope item 02999)
3-Year Annualized Sales Growth	3-year net sales growth (Worldscope item 01101)
Market-to Book Ratio	Market value of common equity (Worldscope Item 08001) divided by Book value of common equity (Worldscope item 03501)

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Appendix Table A.3 – Continued

Variable Definition and Data Source

Variable	Definition and Data Source
CSR Implementation Definitions	
News about Implementation	We conduct news search to determine whether firms actually implement their proposed CSR practices within 12 months following the passage of the proposals. We first match our CSR-related proposals with news contained in Ravenpack News Analytics, based on the following screening criteria: 1) news is announced within one calendar year after the proposal date, and 2) news headlines and the text in the CSR proposal share any words that are not prepositions, articles, and pronouns. To obtain the maximum number of news matches, we use Ravenpack full package, which includes articles from over 150,000 press releases, regulatory disclosures, web aggregators, and blog sites. We remove a few news categories that are likely unrelated to CSR proposals, such as order-imbalances and technical-analysis. This matching procedure yields 23,381 proposal-to-news pairs from 8,888,788 pieces of Ravenpack news for firms with CSR-related proposals. We then calculate term frequency-inverse document frequency (TF-IDF) for each lemmatized common word shared in the voting proposal and news headlines. The TF-IDF is a numerical statistic that is intended to reflect how important a word is in a collection of sentences. We also compute the cosine similarity measure between proposals and news headlines. The cosine similarity is a textual analysis statistic, which is commonly used in the finance literature to measure the similarity among documents. Based on the two textual analysis metrics, we are able to narrow our sample to 1,723 proposal-news pairs with the maximum number of same words matched. We then manually check the 1,723 pairs and further remove 1,175 pairs due to duplications and incorrect matches. As a result, through Ravenpack, our final sample ends up with 548 proposals with implementation-related news. Since we only have access to news headlines through Ravenpack, it is possible that we may miss certain news, of which the proposals are mentioned in its content but not headlines. To mitigate this problem, we use Factiva to check all the proposals that are not matched to Ravenpack news but are within -25% to 25% around the voting pass threshold. We find proposal-related news for additional 93 proposals. To check our proposal and news match quality, we further use Lexis-Nexis bulk API to download more than 20,000 news articles for randomly selected near-the-margin (-10% to 10%) proposals and apply a similar textual analysis method mentioned above. However, we do not find any missed news, or wrongly matched news through Ravenpack and Factiva news matches. (Various news media sources)
Increase in ASSET4 Ratings	An actual CSR implementation based on the change of ASSET4 ratings after the vote. Specifically, if the voting customer's ASSET4 rating increases by more than 10 (on a scale of 1 to 100) in the year after the vote, we interpret it as an indication that the proposal has been implemented. (ASSET4)
Board Recommendationn "For"	A proposal is implemented if the board recommends "YES" (or "FOR") to the proposal before the vote, as this is ex ante observable at the time of the vote and increases the likelihood of the supplier firm actually implementing the proposal. (ISS Global and US Voting Outcomes)

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