

How and Why does a Business-to-Business Firm's Corporate Social Responsibility Disclosure Impact its Dependence on its Major Customers and Major Suppliers?

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Abstract

Prior research has documented that a firm's disclosure of corporate social responsibility (CSR) makes it a more attractive business partner, boosting its sales. The authors extend this finding to business-to-business (B2B) firms. Using a regulatory change in China as a quasi-natural experiment, they demonstrate that a firm's disclosure of its CSR lowers by 2.1% the firm's dependence (for sales revenue) on its major customers but raises by 3.7% its dependence (for purchases) on its major suppliers. They further show that the firm's production efficiency (marketing efficiency) is a mechanism underlying the effect of CSR disclosure on dependence on major customers (suppliers). Next, they demonstrate that the CSR report's emphasis on the firm's supply chain partners weakens (strengthens) the effect on dependence on major customers (suppliers). The findings contribute to the multidisciplinary evidence on the B2B value of CSR disclosure, and the operations and marketing literature streams on determinants of supply-chain dependence.

Keywords

CSR Disclosure, Supply-chain Dependence, Marketing Efficiency, Production Efficiency

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1 Introduction

A firm discloses its corporate social responsibility (CSR¹) hoping that it will improve the firm's financial performance. However, such disclosure is fraught with risk because shareholders may perceive that the managers are not honoring their duty to maximize the firm's profits (e.g., Husted and de Jesus Salazar, 2006), and the disclosure may reveal proprietary information to the firm's rivals and thus hurt its outcomes (e.g., Chen et al., 2022). Consistent with these two-sided arguments on the benefits and risks of CSR disclosure, the empirical evidence is mixed on whether CSR disclosure pays off. Some studies have reported that a firm's CSR disclosure increases its costs and lowers its accounting returns and market value of equity (Chen et al., 2018; Lu et al., 2021; Ren et al., 2020). Others have documented that the firm's CSR disclosure lowers its cost of debt (Xu et al., 2021) and systematic risk (Amadi and Zhu, 2020). The mixed evidence may give managers reason to hesitate in their CSR disclosure.

While the evidence on CSR disclosure's impacts on the firm's accounting and financial outcomes is mixed, academics and practitioners know little about the consequences of the firm's CSR disclosure on supply-chain outcomes. Prior

research has theorized that a firm's CSR disclosure provides *new* and *better nonfinancial* information to its stakeholders

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(Buell and Kalkanci, 2021; Hung et al., 2013; Wang et al., 2018), lowering the stakeholders' information disadvantage and increases their preference for the firm. However, academics and practitioners do not know how and why this preference might impact the firm's outcomes associated with suppliers and customers. This knowledge is critical because a firm's outcomes with its suppliers and customers account for a significant share of the economy (B2BHouse.com, 2023). The prior mixed evidence on the impacts of the firm's CSR disclosure on accounting and financial outcomes does not offer a clear a priori prediction. The absence of this evidence prevents supply-chain managers from contributing to the CSR discourse in their firms. The current paper provides this evidence.

Following up on the evidence that a firm's CSR disclosure makes it attractive to stakeholders, marketing (Ailawadi et al., 2014; Inoue et al., 2017; Nickerson et al., 2022) and operations management (OM) (Buell and Kalkanci, 2021) academics have documented that the attractiveness manifests in additional sales for the focal firm. However, managers would want to know not only whether sales are increasing but also what proportions of the additional sales are made to the firm's major customers and minor customers (Marketing Charts, 2024). If the sales are attributed to major customers, the insight is that CSR disclosure has helped the firm penetrate its major customer accounts. If these sales are made to minor customers, the insight is that CSR has penetrated a minor account.

The question is theoretically interesting because the concentration of sales is a double-edged sword. It can benefit the firm (e.g., Kalwani and Narayandas, 1995) while exposing it to risk (Dhaliwal et al., 2016). Specifically, if the additional sales—attributed to CSR disclosure—are made to the firm's major² customers, its sales revenue gets further “concentrated” (Ak and Patatoukas, 2016; Patatoukas, 2012). Such concentration raises the firm's *dependence* (for sales revenue) on major customers (Dhaliwal et al., 2016; Kim and Henderson, 2015; Kim and Zhu, 2018; Patatoukas, 2012; Zhong et al., 2021). Conversely, if the firm's additional sales are made to minor customers, the dispersion of sales lowers the firm's dependence on major customers (Leung and Sun, 2021).

We next shift our attention to the underlying mechanism. Exchanges between a firm and its customers and suppliers are fraught with information asymmetry (Akerlof, 1970; Williamson, 1991). Prior research has shown that a firm's CSR disclosure mitigates this information asymmetry, making its existing customers prefer the firm and prospective customers aware of the firm (Hung et al., 2013; Wang et al., 2018). We reason that this increase in preference and awareness would make the firm expend fewer input resources for the same level of output, and/or achieve more output for the same level of input—that is, CSR disclosure boosts its resource efficiency. Two types of efficiencies are relevant to the firm's supply chain: production efficiency and marketing efficiency (Chakravarty et al., 2022; Mishra et al., 2022). We hypothesize that a firm's CSR disclosure raises its production efficiency,

which allows it to diversify its sales and thus is negatively associated with its dependence on major customers.

If a firm's CSR disclosure boosts its sales, one would expect the disclosure to increase its purchases as well. A question that parallels our earlier question is: Are these additional purchases sourced from the firm's major suppliers or minor suppliers? If the firm purchases additional supplies from its major suppliers, such purchases will raise its dependence on these suppliers (Casalin et al., 2017; Zhang et al., 2020). Conversely, if the firm sources the purchases from minor suppliers, the dispersion will lower its dependence on its major suppliers. We hypothesize that the firm's CSR disclosure lifts its marketing efficiency, which is associated with disproportionately higher purchases from major suppliers.

Three reasons drive *dependence* as our outcome of interest. First, as noted above, prior research has shown that CSR disclosure makes the firm an attractive partner and increases its sales (Buell and Kalkanci, 2021). However, academics and managers lack evidence of whether the increase comes from major customers or minor customers. Thus, in answering this question, we extend academics' and managers' prior knowledge. Second, commonly used measures of firm performance, such as stock return and its volatility, profit, and innovation, are specific to a firm and not to its relations with customers or suppliers. That is, these outcomes are unilateral and thus not relevant to business-to-business (B2B). In contrast, dependence—by definition—is a bilateral variable and appropriately captures the firm's B2B performance. Third, dependence is uniquely insightful because it helps measure the firm's performance on both sides of its supply chain: customers and suppliers. That is, because the firm sells to customers and purchases from suppliers, it depends on partners on both sides. Therefore, dependence as outcome allows us to offer a comprehensive picture of the firm's performance on both sides of the supply chain.

Following prior research (e.g., Chen et al., 2018; Lu et al., 2021; Wang et al., 2018), we use a regulatory mandate in China to identify our (causal) effect. Specifically, on December 30, 2008, the Shanghai Stock Exchange (SHSE) and the Shenzhen Stock Exchange (SZSE)—under the directive of the Government of China—mandated a subset of firms (“treatment firms”) listed on these two exchanges to issue an annual and standalone CSR report along with their annual financial report (refer to Appendix A of the e-companion). Using this mandate as an exogenous shock, we measure the (causal) effects of a firm's CSR disclosure. We observe firms from 2005 to 2012, with 2005–2008 as the 4-year premandate period and 2009–2012 as the 4-year postmandate period.

We measure a firm's *dependence on major customers* in a year (our dependent variable no. 1, DV1) as the proportion of annual sales revenue the firm received from its top (in terms of sales revenue) five customers.³ By extension, the firm's *dependence on major suppliers* in a year (our DV2) is the proportion of the monetary value of its annual purchases from its top (in terms of costs of purchases) five suppliers (Saboo et al., 2017).

A propensity score matching (PSM) enables us to identify an empirical twin (control firm) for each treatment firm. A subsequent difference-in-differences (DiD) analysis reports that CSR disclosure *lowers* a firm's dependence on its major customers by a marginally significant 2.1%, whereas it *raises* its dependence on its major suppliers by 3.7%.

We next shift our attention to the underlying mechanism. Exchanges between a firm and its customers and suppliers are fraught with information asymmetry (Akerlof, 1970; Williamson, 1991). Prior research has shown that a firm's CSR disclosure mitigates this information asymmetry, making its existing customers prefer the firm and prospective customers aware of the firm (Hung et al., 2013; Wang et al., 2018). We reason that this increase in preference and awareness would make the firm expend fewer input resources for the same level of output, and/or achieve more output for the same level of input—that is, CSR disclosure boosts its resource efficiency. Two types of efficiencies are relevant to the firm's supply chain: production efficiency and marketing efficiency (Chakravarty et al., 2022; Mishra et al., 2022). Mediation tests (e.g., Astvansh and Jindal, 2022; Zhao et al., 2010) support our proposed mechanisms. Specifically, we find that—on the one hand—a firm's CSR disclosure raises its production efficiency, which allows it to diversify its sales and thus is negatively associated with its dependence on major customers. On the other hand, the firm's CSR disclosure lifts its marketing efficiency, which is associated with disproportionately higher purchases from major suppliers.

We have thus far measured the effect of a firm's CSR disclosure on its dependence on major customers and its dependence on major suppliers. We next transition from the effect of “whether to disclose” to the effect of “what to disclose.” Intuitively, a firm's customers and suppliers should be concerned more about the focal firm's responsibility toward its supply chain rather than its responsibility toward all stakeholder groups (e.g., investors and employees) (Dai et al., 2021; She, 2022). Building on this intuition, we measure a firm's *supply-chain emphasis in the CSR report* by the number of mentions of “customer” and its synonyms plus the number of “supplier” and its synonyms in the firm's CSR report in the focal year, divided by the number of words in the focal CSR report. Results suggest that a firm's supply-chain emphasis strengthens the negative effect of its CSR disclosure on its dependence on major customers and weakens the positive effect of its CSR disclosure on its dependence on major suppliers.

Our primary contribution is to the multidisciplinary literature on supply-chain dependence. While multiple studies have demonstrated the effects of dependence, the evidence is scant on what causes a firm to depend more (vs. less) on its supply-chain partners (Chen et al., 2021; Feng et al., 2020; Leung and Sun, 2021). Intersecting the interfirm dependence literature with the CSR research, we contribute by showing that a firm's CSR disclosure boosts its efficiency, impacting its dependence on its supply-chain partners. Our secondary contribution is to the multidisciplinary literature on CSR, which

has thus far focused on firm outcomes related to stakeholder groups other than the supply-chain partners (e.g., Buell and Kalkanci, 2021; Lu et al., 2021).

Our findings make two contributions to practice. First, we inform firms that CSR disclosure yields benefits and costs for the firm's supply-chain outcomes. Further, the more these firms emphasize their suppliers and customers in their CSR reports, the stronger the benefits and the weaker the costs. Now, consider the disclosing firm's existing and prospective customers and suppliers. While managers of these firms likely know that the focal firm will disclose its CSR, we report that the disclosure has informational value for these firms. Managers of these firms may thus benefit from knowing that they can use the focal firm's CSR as a source of information. Second, our findings inform financial market regulators (e.g., the U.S. Securities and Exchange Commission) and proponents of CSR to make a better-informed business case for CSR disclosure.

2 Institutional Background

2.1 China Mandates CSR Disclosure

Rapid economic development in China has combined with social disparity, threatening to disconnect economic growth from social harmony (Han, 2008). In response, in October 2005, the Government of China revised Article 5 of the Companies Law to state, “In its operational activities, a company shall abide by laws and administrative regulations, observe social morals and commercial ethics, persist in honesty and good faith, accept supervision by the government and the public, and assume social responsibility” (https://www.chinadaily.com.cn/m/supremepeoplescourt/2015-08/17/content_21622790_2.htm, p. 1). Relatedly, in 2006, the Government started a series of initiatives to encourage Chinese public firms to demonstrate their social responsibility. These initiatives include (1) the China Banking Regulatory Commission tying a firm's access to bank financing to its CSR performance, (2) the State-owned Assets Supervision and Administration Commission issuing *Guidelines to the State-owned Enterprises Directly under the Central Government* that incentivizes central state-owned enterprises to fulfill their social responsibilities, (3) the Chinese Academy of Social Science publicizing CSR performance ranking, and (4) the official newspaper of the Chinese Communist Party granting CSR awards to firms (Chen et al., 2018). These initiatives rewarded firms with high social performance while penalizing those with low performance.

Aiming to further boost public firms' transparency about their CSR, the SHSE, and the SZSE, *for the first time*, mandated a subset of public firms in December 2008 to disclose in each of the following years a CSR report separate from their annual financial report.⁴ The SHSE and SZSE are fully owned by the Government of China and directly regulated by the China Securities Regulatory Commission (CSRC). Therefore, the disclosure requirement is a governmental mandate.

The exchanges asked firms to report how they have protected the interests and rights of (1) investors, (2) employees, (3) suppliers, customers, and consumers, (4) the environment, and (5) the public (Chen et al., 2018).

All firms in China are required to end their fiscal year on December 31. Thus, the mandate applies to the selected firms for each year starting the fiscal year 2008. Specifically, the Listing Department of the SHSE announced on December 30, 2008, that three types of firms would have to submit a CSR report each year, beginning with 2008. The three types of firms are (1) firms included in the SHSE Corporate Governance Index, (2) firms with shares listed overseas, and (3) financial firms. Similarly, the SZSE announced on December 31, 2008, that all firms included in the Shenzhen 100 Index to disclose CSR reports. As of December 30, 2008, the SHSE Corporate Governance Index included 230 firms with best governance practices. Similarly, the Shenzhen 100 Index included the top 100 firms, ranked by total market capitalization, free-float market capitalization, and share turnover.

Taken together, these firms constitute our treatment group,⁵ while the control group consists of firms that are neither subject to the regulation nor voluntarily issued a CSR report in any year of the postmandate years. Because the China market had no precedence of such mandate, we reason—and empirically verify⁶—that firms are unlikely to have anticipated this mandate. Consequently, following prior research (Chen et al., 2018; Lu et al., 2021), we view the CSR disclosure as an exogenous shock to the firms and use the disclosure mandate for identification.

2.2 Examples of Information Disclosed

A firm's business customers may want to know—among other information—where it sources the raw materials, whether it applies quality management systems (e.g., ISO 9000, Six Sigma), and whether the firm has mechanisms to protect customer data. Consider the example of Xiamen Tungsten, one of the leading tungsten firms in the world with a complete tungsten industrial chain. In December 2008, the SHSE mandated the firm to disclose its CSR report each year along with its financial report. Each year, Xiamen Tungsten's CSR report contains a section named *the firm's protection of the rights and interests of suppliers and customers*. The section states that customer satisfaction is one of the firm's business objectives, and reports on the firm's efforts in protecting customers' rights and interests. For instance, Xiamen Tungsten's 2010 report mentions that it prioritized product quality improvement and obtained the quality management certificate ISO/TS 116949 in 2010. Further, Xiamen Tungsten showed in their 2011 report that they successfully passed the OHSAS 18000 certification for occupational safety. In the meanwhile, they integrated their quality assurance (i.e., ISO 9000), environmental management (i.e., ISO 14000), and occupational safety

(i.e., OHSAS 18000) systems and created a new management system that includes 34 procedural documents and 20 company-level operation instructions.

Suppliers may be interested in knowing, for example, whether the firm requires its suppliers to comply with Fairtrade Standards, or how much the firm monitors its suppliers' environmental emissions. Consider the example of China Yangtze Power, the largest listed electric power company in China and the largest listed hydropower company globally. Like Xiamen Tungsten, China Yangtze Power was required to report its CSR yearly. The firm's CSR report includes a section named *Build a responsible supply chain*. It provides information on how the firm establishes and maintains fair, just, and cooperative relations with suppliers, and fulfills its social responsibility toward its suppliers. For example, in its 2012 report, China Yangtze Power reported that as part of its annual review of supplier qualification, it excluded seven unqualified suppliers.

2.3 Literature Using This Institutional Setting

Extant CSR research has used this institutional setting to examine the implications of CSR disclosure on firm outcomes. For example, a firm's CSR disclosure constrains its earnings management (Rezaee et al., 2020; Wang et al., 2018), thus boosting transparency between the firm and its stakeholders (Hung et al., 2013; Wu et al., 2019). Further, the disclosure caused a drop in the firm's dividend payout and increased corporate tax avoidance, suggesting that stakeholders benefitted at the expense of shareholders and the government (Jiang et al., 2022; Ni and Zhang, 2019). However, the disclosure boosted the firm's investment efficiency (Liu and Tian, 2021; Makosa et al., 2020; Zhong and Gao, 2017), R&D spending (Nguyen et al., 2020), and patent applications (Ren et al., 2023; Zhang, 2022).

Interestingly, the disclosure generated positive social externalities, such as fewer workplace fatalities (Chen et al., 2018) and a decrease in the pay gap between managers and rank-and-file employees (Huang et al., 2022). Similarly, the disclosure produced positive environmental externalities, such as a drop in the levels of industrial wastewater and sulfur dioxide in the cities that were most impacted (Chen et al., 2018).

A notable exception from the literature that has used the 2008 disclosure mandate in China—and the broader CSR literature—is evidence on whether—and if yes, how and why—the disclosure impacts the firm's outcomes concerning its suppliers and business customers. We address this exception. In examining whether a firm's CSR disclosure changes the concentration/diversification of its sales among business customers, we extend the prior finding that CSR disclosure boosts sales (Ailawadi et al., 2014; Buell and Kalkanici, 2021; Nickerson et al., 2022).

3 Method

3.1 Sample

Following prior research (e.g., Chen et al., 2018; Lu et al., 2021; Ren et al., 2023), we collected data on Chinese firms listed on SHSE and SZSE from 2005 to 2012, with 2005–2008 serving as the premandate period and 2009–2012 as the postmandate period. Four years before the mandate and 4 years after it allows us to remove the noise from confounding events and thus accurately measure the impact of the CSR disclosure (vs. no disclosure).

Following prior research (Chen et al., 2018; Lu et al., 2021; Ren et al., 2023), we excluded four types of firms. (1) Financial firms and (2) firms whose stocks are traded in U.S. dollars or Hong Kong dollars on the SHSE and SZSE (shares of such firms are called *B Shares*) because these firms are subject to different disclosure regulations. (3) Firms that reported a negative net profit for 2 or 3 consecutive years because the exchanges impose different rules for trading of such firms' stock.⁷ (4) Firms with missing values for the variables in our specification. Our treatment group thus comprises 278 firms.

We sourced corporate financial data from the China Security Market and Accounting Research database. Following research in marketing (e.g., Lim et al., 2020) and OM (e.g., Astvansh and Jindal, 2022), we winsorized continuous variables at the 1st and the 99th percentiles to control the impact of outliers. Ideally, we expect to observe the 278 treatment firms for each of the 4 years (2005–2008) in the premandate period and the 4 years (2009–2012) in the postmandate period. We thus expect $278 \times 4 = 1112$ observations in the premandate period and an equal number in the postmandate period. However, because some firm-year observations do not have values for one or more of the eight control variables, we observed 1005 observations in the premandate period and 1082 in the postmandate period, totaling 2087 firm-year observations in the treatment group.⁸ For each of the 278 treatment firms, we manually checked whether it had disclosed its CSR in the mandate period (2005–2008), and we found zero such cases, suggesting that the mandate serves as a valid treatment. Table B1 in the e-companion reports the number of observations in our sample, by industry.

3.2 Research Design

3.2.1 Propensity Score Matching. Next, because the firms subject to the mandate (i.e., treatment firms) are not assigned randomly, sample selection is a significant concern in our setting. Specifically, because membership in the SHSE Corporate Governance index and the SHENZHEN 100 Index is determined by firm size, profitability, and other firm characteristics, the firms included in the index may systematically differ at the outset, and thus the membership in the treatment group is nonrandom. Such nonrandom assignment of firms to treatment versus control status could bias our estimates. Following prior research (Chen et al., 2018; Lu et al., 2021;

Ren et al., 2023), we address this potential bias by using the PSM method to build balanced groups of treatment firms and control firms.

However, before we estimate the PSM, we must ensure that our sample is “clean.” We aim to measure the (causal) effect of a firm's CSR disclosure on its dependence on supply-chain partners. The measurement requires our sample to meet two conditions. First, we need a group of treatment firms that must *not* have disclosed their CSR in the premandate years but are exogenously required to disclose it in the postmandate years. Second, the control firms must have reported their CSR *neither* in the premandate period *nor* in the postmandate period. The SHSE/SZSE mandate allows us to fulfill the first condition and thus obtain a clean group of treatment firms.

We constituted our control group in three steps. First, we began with all firms listed on SHSE and SZSE that have never been mandated to report their CSR. Second, we manually verified that none of these firms disclosed their CSR during the premandate period spanning 2005–2008. Third, although SHSE and SZSE did not mandate these firms to report their CSR, they may have voluntarily disclosed their CSR in one or more years of the postmandate period, 2009–2012. Therefore, we manually examined each control firm-year observation from step 2 and excluded firm-years that voluntarily reported their CSR in one or more years of our postmandate period. At the end of this step, our control group was “clean”—that is, no firm-year in the control group had a CSR disclosure.

Next, we estimate a logit regression with the premandate sample to estimate the probability of the SHSE/SZSE mandating the focal firm to report their CSR. Following Chen et al. (2018), our PSM uses the following six covariates: market value (*Market Value*), annual stock return (*Stock Return*), profitability (return on assets, *ROA*), the proportion of shares held by the governments (*State Ownership*), corporate donations (*Donations*), and the number of analysts following the firm (*Analyst Following*). We also include the industry-fixed effects in the logit regression. Table 1 reports the variables.

After estimating the propensity score for each firm (from the logit regression), we use the “nearest neighborhood matching method with replacement” to match each treatment firm with one control firm (Chen et al., 2018). We set the caliper to a 0.25 standard deviation of the propensity score (Chen et al., 2018). Table 2 reports the balance test for differences of covariates across the treatment firms and their control counterparts before and after the matching. For each of the six covariates, PSM has eliminated the difference between the mean value in the treatment group and the mean value in the control group before the mandate. After these procedures, we match each of the 278 treatment firms to 258 control firms (a control firm can match to more than one treatment firm). Ideally, we expect to observe each of the 258 control firms for each of the 4 years (2005–2008) in the premandate period and the 4 years (2009–2012) in the postmandate firms. We thus expect $258 \times 4 = 1032$ in each period. However, because some observations do not have values for one or more of the eight control

Table 1. Variable key.

Description	Name	Role	Measure
Dependence on major customers	<i>Dependence on major customers_{i,t}</i>	Primary outcome variable	$Dependence\ on\ major\ customers_{i,t} = \frac{\sum_{j=1}^5 (sale_{i,j,t})}{sale_{i,t}}$ <p>Subscript <i>j</i> indexes <i>i</i>'s top five customers in year <i>t</i> References: Dhaliwal et al. (2016); Jiang et al. (2023)</p>
Dependence on major suppliers	<i>Dependence on major suppliers_{i,t}</i>	Primary outcome variable	$Dependence\ on\ major\ suppliers_{i,t} = \frac{\sum_{j=1}^5 (purchase_{i,j,t})}{purchase_{i,t}}$ <p>Subscript <i>j</i> indexes <i>i</i>'s top five suppliers in year <i>t</i>. References: Casalin et al. (2017); Jiang et al. (2023)</p>
Treatment	<i>Treatment_t</i>	Explanatory variable	= 1 if SHSE/SZSE mandated the focal firm to disclose a CSR report each year starting 2009, and 0 otherwise References: Chen et al. (2018); Lu et al. (2021)
Post	<i>Post_t</i>	Explanatory variable	= 1 for the years 2009 through 2012, and 0 for the years 2005 through 2008 References: Chen et al. (2018); Lu et al. (2021)
Supply-chain emphasis in the CSR report	<i>Supply-chain emphasis in the CSR report_{i,t}</i>	Alternate explanation (moderator variable)	$Supply\ -\ chain\ emphasis\ in\ the\ CSR\ report_{i,t} = \frac{Ratio_{i,t} - Mean_ratio_t}{Sd_ratio_t}$ <p><i>Ratio_{i,t}</i> is the proportion of supply-chain terms in the firm <i>i</i>'s report year <i>t</i> (the management discussion and analysis (MD&A) section of the annual report in premandate years, and CSR report (for postmandate years). <i>Mean_ratio_t</i> and <i>Sd_ratio_t</i> are the mean for the <i>Ratio</i> and the standard deviation around the mean of the <i>Ratio</i> for all firms in our sample in <i>t</i>.</p>
Marketing efficiency	<i>Marketing efficiency_{i,t}</i>	Mechanism variable	$\ln(Sales_{i,t}) = \alpha_0 + \beta_1 \ln(Stock\ of\ SG\&A\ expenses_{i,t}) + \beta_2 \ln(Stock\ of\ patents_{i,t}) + \beta_3 \ln(Stock\ of\ previous\ years'\ sales_{i,t}) + \beta_4 \ln(Stock\ of\ goodwill_{i,t}) + Industry + a_i + \epsilon_{i,t}$ <p>Reference: Chakravarty et al. (2022)</p>
Production efficiency	<i>Production efficiency_{i,t}</i>	Mechanism variable	$\ln(Value-added_{i,t}) = \alpha_0 + \beta_1 \ln(PPE_{i,t}) + \beta_2 \ln(Inventory_{i,t}) + \beta_3 \ln(Employees_{i,t}) + Industry + a_i + \epsilon_{i,t}$ <p>Reference: Mishra et al. (2022)</p>
Credit sales	<i>Credit sales_{i,t}</i>	Secondary (firm performance) outcome variable	$Credit\ sales_{i,t} = \frac{Accounts\ receivable_{i,t}}{sales_{i,t}}$ <p>Reference: Astvansh and Jindal (2022)</p>
Credit purchases	<i>Credit purchases_{i,t}</i>	Secondary (firm performance) outcome variable	$Credit\ purchases_{i,t} = \frac{Accounts\ payable_{i,t}}{Cost\ of\ goods\ sold_{i,t} + \Delta inventory_{i,t}}$ <p>Reference: Astvansh and Jindal (2022)</p>
Marketing	<i>Marketing_{i,t}</i>	Heterogeneity (subsampling)	$Marketing_{i,t} = \frac{SG\&A\ expenses_{i,t}}{Total\ assets_{i,t}}$ <p>Reference: Banker et al. (2019)</p>

Continue

Table I. Continued.

Description	Name	Role	Measure
Pricing power	$Pricing\ power_{i,t}$	Heterogeneity (subsampling)	$Pricing\ power_{i,t} = \frac{Operating\ income_{i,t} - Operating\ costs_{i,t} - Selling\ expenses_{i,t} - administrative\ expenses_{i,t}}{Operating\ income_{i,t}}$ Reference: Xiong et al. (2021)
Industry sales concentration	$Industry\ sales\ concentration_{k,t}$	Heterogeneity (subsampling)	The proportion of the operating revenue of the top 4 firms in the China Securities Regulatory Commission (CSRC) 2-digit industry to that of the whole industry. Reference: Ali et al. (2014)
Size	$Size_{i,t}$	Control	$Size_{i,t} = \ln(Total\ assets_{i,t})$
Age	$Age_{i,t}$	Control	$Age_{i,t} = \ln(1 + t - IPOyear_{i,t})$
Leverage	$Leverage_{i,t}$	Control	$Leverage_{i,t} = \frac{Total\ liabilities_{i,t}}{Total\ assets_{i,t}}$
Sales growth rate	$Growth_{i,t}$	Control	$Growth_{i,t} = \frac{Sale_{i,t} - Sale_{i,t-1}}{Sale_{i,t-1}}$
Tobin's q	Tobin's $q_{i,t}$	Control	$Tobin's\ q_{i,t} = \frac{Market\ value_{i,t}}{Total\ assets_{i,t}}$
Largest shareholder's ownership	$Largest\ shareholder's\ ownership_{i,t}$	Control	The number of shares held by the largest shareholder scaled by the number of all outstanding shares
Institutional ownership	$Institutional\ ownership_{i,t}$	Control	The number of shares of i in year t held by institutional investors divided by the number of i 's outstanding shares in year t
CSR spending	$CSR\ spend_{i,t}$	Control	Firm i 's CSR expenditure in year t divided by its total assets in year t
Profitability	$Profitability_{i,t}$	Matching variable	$Profitability_{i,t} = \frac{Net\ income_{i,t}}{Total\ assets_{i,t-1}}$
Market value	$Market\ value_{i,t}$	Matching variable	The natural logarithm of the market value of firm i 's equity in year t
Annual stock return	$Stock\ return_{i,t}$	Matching variable	The firm i 's annual stock return in year t
Corporate donations	$Donations_{i,t}$	Matching variable	The logarithm of one plus a firm's annual donations (in RMB)
Analyst coverage	$Analyst\ coverage_{i,t}$	Matching variable	The natural logarithm of one plus the analyst number following a firm in year t
State ownership	$State\ ownership_{i,t}$	Matching variable	The number of shares of i in year t held by the government divided by the number of i 's outstanding shares in year t

Note: Subscripts: i for a firm, j for i 's major customer or major supplier, k for i 's industry, and t for the year of observation. All variables other than *Industry sales concentration* are firm specific. In the interest of shorter variable names, we do not add the "Firm" prefix to firm-specific variables.

CSR = corporate social responsibility; SHSE = Shanghai Stock Exchange; SZSE = Shenzhen Stock Exchange; SG&A = sales, general, and administration; PPE = property, plant, and equipment.

variables, our control group includes 926 observations in the premandate period and 972 in the postmandate period, totaling 1898 observations in both periods.

3.2.2 Empirical Model. To measure the impact of CSR disclosure on supply-chain dependence, we follow Chen et al. (2018) and Lu et al. (2021) and employ a DiD method to the

Table 2. Effectiveness of the PSM.

Covariates	Matching status	Mean (Treatment) (1)	Mean (Control)(2)	%bias	%reduction bias	Diff (1) – (2)	t-stat
Profitability	Pre-match	0.114	0.020	62.7		0.094	15.51
	Post-match	0.114	0.119	–3.3	94.7	–0.005	–1.14
Market value	Pre-match	22.193	20.971	110.4		1.222	33.17
	Post-match	22.191	22.21	–1.7	98.5	–0.019	–0.34
Stock return	Pre-match	0.654	0.467	15.8		0.187	4.51
	Post-match	0.654	0.647	0.6	96.1	0.007	0.14
Donations	Pre-match	5.903	4.487	23.5		1.416	6.7
	Post-match	5.894	6.023	–2.1	90.9	–0.129	–0.47
Analyst coverage	Pre-match	1.792	0.664	117.4		1.128	34.18
	Post-match	1.791	1.742	5.1	95.6	0.049	1.09
State ownership	Pre-match	0.353	0.265	38		0.088	10.64
	Post-match	0.353	0.354	–0.3	99.1	–0.001	–0.07

Note: This table presents the difference in means of the covariates employed to match treatment and control firms. *Pre-match* and *Post-match* denote the samples before and after the match, respectively. The third and fourth columns show the mean value of each variable for the treatment and control group, respectively. %bias denotes the standardized deviation of the mean values of the two groups, and the following column reports the extent to which the error has been minimized. *Diff* represents the difference of the mean values of the two groups, and the last column indicates the significance of the difference.

PSM = propensity score matching.

matched sample. Our two DiD regressions—one for each of the two outcomes of interest—are as follow:

$$\begin{aligned} & \text{Dependence on major customers}_{i,t} \\ &= \beta_0 + \beta_1(\text{Treatment}_i \times \text{Post}_t) \\ & \quad + \beta_2 \text{Controls}_{i,t} + \text{Firm}_i + \text{Year}_t + \epsilon_{i,t} \end{aligned} \quad (1)$$

$$\begin{aligned} & \text{Dependence on major suppliers}_{i,t} \\ &= \beta_0 + (\beta_1 \text{Treatment}_i \times \text{Post}_t) \\ & \quad + \beta_2 \text{Controls}_{i,t} + \text{Firm}_i + \text{Year}_t + \epsilon_{i,t} \end{aligned} \quad (2)$$

Subscripts i and t denote firm and year, respectively.

A firm i 's *Dependence on major customers* in year t is a ratio. The numerator is the sum of the sales revenue the focal firm received from its top five customers in the year t . The denominator is the sales revenue the firm i earned from all customers in the year t (Dhaliwal et al., 2016; Patatoukas, 2012; Saboo et al., 2017). Similarly, the firm i 's *Dependence on major suppliers* in the year t is a ratio. The numerator is the sum of monetary purchases firm i made from its top five suppliers in year t . The denominator is the monetary firm i 's purchases from all its suppliers in year t (Casalin et al., 2017; Jiang et al., 2023).⁹

Treatment is an indicator variable, which equals 1 if the SHSE/SZSE mandated the firm to disclose its CSR report every year starting 2009 (i.e., treatment firm), and 0 otherwise (i.e., control firm). *Post* is an indicator variable, which equals 1 for years of the postmandate period (2009–2012) and 0 for the years of the premandate period (2005–2008). $\text{Treatment} \times \text{Post}$ is the regressor of our interest. It measures the difference in the treatment firm's and its empirical control twin's outcomes in the postmandate period and the premandate period (thus, the

term DiD). Stated simply, β_1 in equations (1) and (2) captures the DiD (causal) effect of the CSR disclosure.

Controls include firm-level covariates that prior literature has used to explain supply-chain dependence (Kim and Lee, 2020; Leung and Sun, 2021). These include firm size (*Size*), firm age (*Age*), leverage ratio (*Leverage*), profitability (*Profitability*), sales growth rate (*Growth*), Tobin's q (*Tobin's q*), and the proportion of shareholding held by the largest shareholder (*Largest Shareholder's Ownership*). We also include in our DiD regressions fixed effects for the firm and the year and cluster the standard errors at the firm level (Petersen, 2009).

4 Results

4.1 Descriptive Statistics

Table B2 (in Appendix B of the e-companion) presents the descriptive statistics of the variables. The average value of *Dependence on major customers* and *Dependence on major suppliers* are 0.274 and 0.341, respectively, suggesting that firms in our sample depend more on their major suppliers (upstream partners in firms' supply chain) than their major customers (downstream partners). In addition, the mean values of *Treatment* and *Post* are 0.539 and 0.506, respectively, indicating an equitable number of treatment firms and control firms in the premandate and the postmandate periods. Table B3 (in Appendix B of the e-companion) reports the Pearson correlation coefficients of the variables.

4.2 Main Effect

Table 3 reports the results of the baseline regression.¹⁰ The outcome variable in columns (I) and (III) is the focal

Table 3. CSR disclosure and supply-chain dependence.

	Dependence on major customers (I)	Dependence on major suppliers (II)	Dependence on major customers (III) Testing alternate explanation that the effect is driven by CSR activities and not mere disclosure of CSR	Dependence on major suppliers (IV)
Treatment \times Post	-0.021** (-2.00)	0.037*** (2.79)	-0.021* (-1.92)	0.037*** (2.74)
Size	-0.010 (-0.85)	-0.034** (-2.47)	-0.010 (-0.84)	-0.034** (-2.48)
Age	0.012 (0.86)	-0.005 (-0.32)	0.012 (0.86)	-0.005 (-0.32)
Leverage	-0.061 (-1.38)	-0.060 (-1.17)	-0.061 (-1.39)	-0.059 (-1.16)
Profitability	0.066 (0.65)	0.007 (0.06)	0.064 (0.64)	0.008 (0.07)
Growth	0.006 (0.96)	-0.005 (-0.72)	0.006 (0.96)	-0.005 (-0.73)
Tobin's q	0.002 (0.48)	0.004 (0.77)	0.002 (0.49)	0.004 (0.76)
Largest shareholder's ownership	0.016 (0.24)	-0.093 (-1.27)	0.016 (0.24)	-0.093 (-1.26)
CSR spend			-0.139* (-1.85)	0.149 (0.73)
Constant	0.533** (2.09)	1.182*** (4.12)	0.505** (1.97)	1.185*** (4.06)
Firm FEs	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes
N	3228	2758	3228	2758
Adjusted R^2	0.019	0.048	0.019	0.048

Note: This table presents the impact of a firm's CSR disclosure on its *Dependence on major customers* and *Dependence on major suppliers*. *Treatment* is an indicator variable that equals 1 if SHSE and/or SZSE mandated the focal firm to disclose a CSR report each year starting 2009, and 0 otherwise. *Post* is an indicator variable that equals 1 for the years 2009 through 2012, and 0 for the years 2005 through 2008. The t statistics are in parentheses below the coefficients, with the standard error clustered by firm.

*, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

firm's *Dependence on major customers* in the focal year, whereas the outcome variable in columns (II) and (IV) is the firm's *Dependence on major suppliers* in the focal year.

We find that a firm's CSR disclosure asymmetrically impacts its dependence on major customers and its dependence on major suppliers. Specifically, the coefficient of *Treatment \times Post* in column (I) is *negative* and significant at 5%, indicating that the firm's CSR disclosure (vs. an empirical twin's nondisclosure) *marginally lowers* the firm's dependence on major customers. The finding supports the intuition that the firm's CSR disclosure lowers existing and prospective customers' information asymmetry with respect to the firm. The lowered information asymmetry makes (1) existing customers prefer the firm as a partner and (2) prospective customers aware of the firm (Brown and Dacin, 1997; Du et al., 2011; Servaes and Tamayo, 2013). The increased preference and awareness allow the firm to lower the concentration of—or

diversify—its sales among customers (Buell and Kalkanci, 2021; Nickerson et al., 2022).

In contrast, the coefficient for *Treatment \times Post* in column (II) is *positive* at a 1% level of significance, indicating that a firm's CSR disclosure (vs. an empirical twin's nondisclosure) raises the firm's dependence on its major suppliers. This finding suggests that to meet the increased sales, the firm procures supplies from major suppliers, resulting in a further concentration of its purchases among major suppliers (Luo and Zheng, 2013).

The impact of the CSR disclosure is not only statistically significant but also economically consequential. The coefficients of *Treatment \times Post* in columns (III) and (IV) are -0.021 and 0.037, suggesting that the disclosure lowers a firm's dependence on its major customers by 2.1%, whereas it raises the firm's dependence on its major suppliers by 3.7%.

4.3 Is CSR Activities (and Not Disclosure) an Alternate Explanation?

One could reason that our result may also be driven by a firm's CSR activities rather than mere disclosure (Jackson et al., 2017). We test this alternate explanation by including in our DiD regressions firm i 's CSR spend in year t . Following Lu et al. (2021), firm i 's CSR spend in year t is the ratio of its CSR expenditure in year t to the monetary value of its total assets in year t . We manually collected the CSR expenditure values from firms' annual financial reports in the premandate period and from the CSR reports in the postmandate period. Columns (III) and (IV) of Table 3 report the estimates. The coefficient of $Treatment \times Post$ is still negative and significant at 10% in column (III) (effect size is 2.1%, same as what column (I) reports), while the coefficient for $Treatment \times Post$ remains positive at the 1% significance level in column (IV) (effect size is 3.7%, same as what model II reports), suggesting that our results are less likely attributable to the firm's CSR activities.

4.4 Resource Efficiency as a Mechanism: Mediation Analysis

Our premise is that a firm's CSR disclosure provides new and better information to its customers and suppliers, making the firm a more attractive supply-chain partner. Were this premise to be true, one would expect the firm to expend fewer resource inputs for the same level of outputs and/or achieve a higher level of outputs for the same level of inputs. We use this intuition to propose the firm's resource efficiency as a mechanism underlying the effects of its CSR disclosure on its dependence on major customers and dependence on major suppliers.

Specifically, we suggest that the firm's CSR disclosure enhances its ability to convert its production inputs (i.e., the monetary value of property, plant, and equipment (PPE), inventory, and the number of employees) into the production outputs (specifically, value-added, which is revenue minus cost; Mishra et al., 2022). Next, prior research (e.g., Bhattacharya et al., 2022) has shown that the firm's production efficiency has a downstream positive impact on its sales. Because major customers have limited ability to purchase from the focal supplier, the lift in production efficiency means that the firm will diversify its sales among minor customers. That is, all else equal, the firm will source additional sales from a broader set of customers as opposed to the major customers, and thus lower the concentration of its sales among major customers. In summary, a firm's CSR disclosure raises the firm's production efficiency, which in turn lowers the firm's dependence on major customers.

Mimicking this logic on the other side of the supply chain, we reason that a firm's CSR disclosure boosts its efficiency in converting its marketing input (i.e., sales, general, and administration (SG&A) expenses, installed customer base, patents,

and goodwill) into sales revenue. Higher marketing efficiency means the firm needs more supplies. We reason that, unlike the firm's major customers, who have an upper limit on how much they are willing and able to buy from the firm, its major suppliers will be more flexible to meet its increased demand. Further, creating new suppliers is a long process that requires selection, screening, and contracting. Thus, the firm may purchase these additional supplies from major suppliers rather than from minor suppliers or contracting with new suppliers. That is, the higher the firm's marketing efficiency, the more concentrated its purchases among major suppliers. In summary, a firm's CSR disclosure raises the firm's marketing efficiency, which increases the firm's dependence on major suppliers.¹¹

We follow Mishra et al. (2022) to construct the production efficiency for each firm-year observation. Specifically, we employ the stochastic frontier estimation method to calculate the firm-year-specific production efficiency. The firm-year-specific value-added (revenues minus cost of goods sold) serves as our measure of the firm's production output, which is created from three production inputs: (1) the monetary value of PPE, (2) the monetary value of inventory, and (3) the number of employees. The model is specified as follows:

$$\begin{aligned} \ln(\text{Value_added}_{i,t}) & \\ &= \alpha_0 + \beta_1 \ln(\text{PPE}_{i,t}) + \beta_2 \ln(\text{INV}_{i,t}) \\ &\quad + \beta_3 \ln(\text{EMP}_{i,t}) + \text{Industry} + a_i + \varepsilon_{i,t} \end{aligned} \quad (3)$$

$\text{Value_added}_{i,t}$ is the difference between sales revenues and costs of goods sold for firm i in the year t . $\text{PPE}_{i,t}$ is the monetary value of property, plant, and equipment for firm i in the year t . $\text{INV}_{i,t}$ is the monetary value of inventory for firm i in the year t . $\text{EMP}_{i,t}$ is the number of employees for firm i in the year t . Industry is the firm's CSRC industry code.¹² a_i is the time-invariant firm effect, and $\varepsilon_{i,t}$ is the time-varying error term.

Our mediation analyses follow recent research in marketing (Zhao et al., 2010) and OM (e.g., Astvansh and Jindal, 2022). We begin by testing CSR disclosure \rightarrow production efficiency \rightarrow dependence on major customers. That is, we estimate a mediation model, which comprises two regressions, estimated simultaneously. The first regression (equation (4)) regresses a firm's Production efficiency on its CSR disclosure (i.e., $Treatment \times Post$). The second regression (equation (5)) regresses the firm's Dependence on major customers on $Treatment \times Post$ and Production efficiency. The estimated coefficient of $Treatment \times Post$ from this regression is the direct effect of the firm's CSR disclosure on its Dependence on major customers. We already know from the regression of equation (1) (column (I) of Table 4) the total effect of a firm's

Table 4. Resource efficiency as a mechanism.

DVs =	Dependence on major customers (I)	Production efficiency (II)	Dependence on major customers (III)	Dependence on major suppliers (IV)	Marketing efficiency (V)	Dependence on major suppliers (VI)
Treatment × Post	−0.023*** (−3.21)	0.049*** (12.71)	−0.014** (−2.00)	0.034*** (3.20)	0.005*** (3.00)	0.031*** (2.98)
Production efficiency			−0.185*** (−4.18)			
Marketing efficiency						0.511*** (2.77)
Size	−0.010 (−1.05)	0.018*** (4.27)	−0.006 (−0.68)	−0.034*** (−3.04)	−0.001 (−0.32)	−0.033*** (−3.06)
Age	0.011 (1.01)	0.018** (2.48)	0.014 (1.31)	−0.008 (−0.36)	0.005 (1.30)	−0.010 (−0.48)
Leverage	−0.058 (−1.40)	0.010 (0.97)	−0.057 (−1.35)	−0.056 (−1.31)	0.019*** (2.20)	−0.066 (−1.59)
Profitability	0.067 (0.73)	−0.005 (−0.21)	0.067 (0.72)	−0.008 (−0.08)	0.025* (0.99)	−0.020 (−0.22)
Growth	0.006 (1.12)	−0.004** (−2.58)	0.006 (0.99)	−0.004 (−0.52)	0.013*** (5.35)	−0.011 (−1.36)
Tobin's q	0.0001 (0.05)	−0.001 (−0.78)	−0.000 (−0.03)	0.005 (0.93)	−0.001 (−0.91)	0.005 (1.08)
Largest shareholder's ownership	0.008 (0.15)	0.072*** (3.75)	0.021 (0.40)	−0.094 (−1.57)	−0.008 (−0.73)	−0.090 (−1.53)
Constant	0.279 (1.33)	2.34*** (19.73)	0.712*** (3.10)	0.989*** (3.83)	0.811*** (13.70)	0.575*** (1.97)
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
N	3195	3195	3195	2684	2684	2684
Adjusted R ²	0.855	0.936	0.829	0.761	0.884	0.708
Indirect effect			−0.009***			0.003**
Proportion of total effect that is mediated			39%			8.2%

Note: This table reports whether (I) production efficiency underlies the effect of a firm's CSR disclosure on its dependence on major customers and (2) marketing efficiency underlies the effect of its CSR disclosure on its dependence on major suppliers. The *t* statistics are in parentheses below the coefficients, with the standard error clustered by firm.

*, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

Our sample has shrunk slightly because some firm-years do not have values for the efficiency measures.

CSR disclosure on its *Dependence on major customers*.

*Production efficiency*_{*i,t*}

$$= \gamma_0 + \gamma_1(\text{Treatment}_i \times \text{Post}_t) + \gamma_2 \text{Controls}_{i,t} + \text{Firm}_i + \text{Year}_t + \varepsilon_{i,t} \quad (4)$$

*Dependence on major customers*_{*i,t*}

$$= \theta_0 + \theta_1(\text{Treatment}_i \times \text{Post}_t) + \theta_2 \text{Production efficiency}_{i,t} + \theta_3 \text{Controls}_{i,t} + \text{Firm} + \text{Year} + \varepsilon_{i,t} \quad (5)$$

Table 4 reports the mediation results. Column (I) reports that the total effect of a firm's CSR disclosure on its dependence on major customers is −0.023. Column (II) reports that a firm's CSR disclosure increases its *Production efficiency* by 4.9% ($b = 0.049, p < .01$). Column (III) shows that the firm's

production efficiency is associated with a decline in its dependence on major customers ($b = -0.185, p < .01$). After we control for the mechanism variable, the effect of CSR disclosure on dependence while staying statistically significant, decreases from −0.023 to −0.014. Therefore, the indirect effect of the firm's CSR disclosure on its dependence on major customers (via production efficiency) is $0.049 \times -0.185 = -0.009$, which amounts to 39% of the total effect of −0.023.

We next test whether a firm's marketing efficiency is a mechanism underlying the effect of its CSR disclosure on its dependence on major suppliers. Following Chakravarty et al. (2022), we construct marketing efficiency for each firm-year observation. Like the production efficiency measure, marketing efficiency is also calculated using stochastic frontier estimation. The firm's sales revenue serves as its

marketing output. The marketing inputs include the firm's stocks¹³ of (1) SG&A expenses, (2) patents, (3) prior sales (a measure of installed customer base), and (4) goodwill. The model is specified as follows:

$$\begin{aligned} \ln(\text{Sales revenue}_{i,t}) &= \alpha_0 + \beta_1 \ln(\text{Stock of SG\&A expenses}_{i,t}) \\ &+ \beta_2 \ln(\text{Stock of patents}_{i,t}) \\ &+ \beta_3 \ln(\text{Stock of prior sales}_{i,t}) \\ &+ \beta_4 \ln(\text{Stock of goodwill}_{i,t}) + \text{Industry} + a_i + \varepsilon_{i,t} \quad (6) \end{aligned}$$

$\text{Sales revenue}_{i,t}$ is firm i 's sales revenue in year t . $\text{Stock of SG\&A expenses}_{i,t}$ is the firm i 's stock of sales, general, and administration expenses in year t . $\text{Stock of patents}_{i,t}$ is the firm i 's stock of patents in year t . $\text{Stock of prior sales}_{i,t}$ measures the firm i 's installed base of customers in year t . $\text{Stock of goodwill}_{i,t}$ is the firm i 's stock of goodwill in year t . The Industry is the firm's CSRC industry code. a_i is the time-invariant firm effect, and $\varepsilon_{i,t}$ is the time-varying error term.

We estimate equations (7) and (8) simultaneously. Equation (7) regresses a firm's *Marketing efficiency* on its CSR disclosure (i.e., $\text{Treatment} \times \text{Post}$). Equation (8) regresses the firm's dependence on major suppliers on $\text{Treatment} \times \text{Post}$ and *Marketing efficiency*. The estimated coefficient of $\text{Treatment} \times \text{Post}$ from this regression is the *direct* effect of the firm's CSR disclosure on its dependence on major suppliers.

$$\begin{aligned} \text{Marketing efficiency}_{i,t} &= \gamma_0 + \gamma_1 (\text{Treatment}_i \times \text{Post}_t) \\ &+ \gamma_2 \text{Controls}_{i,t} + \text{Firm}_i + \text{Year}_t + \varepsilon_{i,t} \quad (7) \end{aligned}$$

$$\begin{aligned} \text{Dependence on major suppliers}_{i,t} &= \theta_0 + \theta_1 (\text{Treatment}_i \times \text{Post}_t) + \theta_2 \text{Marketing efficiency}_{i,t} \\ &+ \theta_3 \text{Controls}_{i,t} + \text{Firm} + \text{Year} + \varepsilon_{i,t} \quad (8) \end{aligned}$$

Table 4 reports the estimates from the mediation model. Column (IV) shows that the total effect of a firm's CSR disclosure on its dependence on major suppliers is 0.034. Column (V) reports that the effect of $\text{Treatment} \times \text{Post}$ on *Marketing efficiency* is positive and statistically significant ($b = 0.005$, $p < .01$), suggesting that a firm's CSR disclosure boosts its marketing efficiency by 0.5%. Column (VI) reports that the firm's marketing efficiency is positively associated with its dependence on major suppliers ($b = 0.511$, $p < .01$). After we control for the firm's marketing efficiency, the direct effect of its CSR disclosure on its dependence on major customers stays significant ($b = 0.031$, $p < .01$). Because the direct effect is statistically significant, we conclude that marketing efficiency partially mediates the effect of the firm's CSR disclosure on its dependence on major customers. The indirect effect is $0.005 \times 0.511 = 0.003$, equivalent to 8.2% of the total effect of 0.034.

4.5 Heterogeneity Analyses

4.5.1 Heterogeneity by the Supply-Chain Emphasis in the CSR Report. A firm's investors want to know whether its investments and other actions convey responsibility toward its investors. Such responsibility—or the lack thereof—helps investors estimate the firm's risk exposure and determine whether the managers are making decisions that maximize the firm's value to investors. However, customers and suppliers are more concerned with information relevant to the firm's supply chain as opposed to that about firm investments and risks (Dai et al., 2021; She, 2022). A firm's *emphasis* on its supply chain partners in its CSR report suggests its focus on the supply chain. Therefore, we reason that such emphasis may moderate the effect of the firm's CSR disclosure on its dependence on major customers and dependence on major suppliers.

We test this reasoning by creating a moderator variable *Supply-chain emphasis in the CSR report*, a standardized ratio. The numerator is the sum of (1) the count of "customer" and its synonyms and (2) the count of "supplier" and its synonyms. The denominator is the number of words in the "report." The relevant report in the postmandate period is the CSR report. However, the CSR report is—as expected—unavailable in the premandate period. Therefore, we use the management discussion and analysis (MD&A) section of the firm's annual report in the premandate period. Because we use different sources of data in the premandate and the postmandate periods, we standardize the ratio annually. Specifically, $\text{Supply-chain emphasis in the CSR report}_{i,t} = (\text{Ratio}_{i,t} - \text{Mean_ratio}_t) / \text{Sd_ratio}_t$. $\text{Ratio}_{i,t}$ is the proportion of supply chain terms in the firm i 's relevant report (MD&A report in the premandate years and CSR report in the postmandate years). Mean_ratio_t and Sd_ratio_t are the mean value and the standard deviation around the mean for the Ratio of all firms in t , respectively. Higher values of *Supply-chain emphasis in the CSR report* indicate that the firm mentions its supply-chain partners more often than its industry peers in the same year. If our prediction—that a B2B firm's CSR disclosure makes it a more attractive partner—is right, we should find a significant coefficient for the interaction term for $\text{Treatment} \times \text{Post} \times \text{Supply-chain emphasis in the CSR report}$.

Table C1 reports the results. As expected, the coefficients for $\text{Treatment} \times \text{Post} \times \text{Supply-chain emphasis in the CSR report}$ are negative and significant, at least at the 10% level in both columns. The insight is that supply-chain emphasis in a firm's CSR report (1) strengthens the negative/favorable effect of its CSR disclosure on its dependence on major customers, and (2) weakens the positive/unfavorable effect of CSR disclosure on dependence on major suppliers.¹⁴

4.5.2 Heterogeneity by the Disclosing Firm's Marketing Spending. Our primary finding (reported in Table 3) is that a firm's CSR disclosure (vs. an empirical control firm's nondisclosure) lowers its dependence on major customers and raises its

dependence on major suppliers. These effects exist because the firm's CSR disclosure lowers its customers' and suppliers' information disadvantage, making it a more attractive partner for existing firms. Were this theory true, marketing—an alternate source of information for the firm's customers and suppliers (Lloyd-Smith and An, 2019)—should be a relevant characteristic to explore the heterogeneity in the effects of CSR disclosure. Empirical research has offered contradictory findings on whether marketing complements or substitutes CSR's effect on firm performance. Lloyd-Smith and An (2019) reported that a firm's advertising spending substitutes the effect of its CSR rating on its overall reputation. In contrast, Servaes and Tamayo (2013) reported that the firm's advertising spending complements its CSR rating in impacting Tobin's q .

Following prior research, we expect marketing and CSR disclosure to substitute each other's effect on dependence (Banerjee and Wathieu, 2017; Lloyd-Smith and An, 2019). Thus, the effects of CSR disclosure should be stronger for firms that spend less on marketing. Empirical tests support this theory. Specifically, Table C2 reports that CSR disclosure lowers dependence on major customers and dependence on major suppliers for only those firms that spend *less* (than the median value in our sample) on marketing. Alternatively, CSR disclosure does not impact dependence for firms that spend high on marketing.

4.5.3 Heterogeneity by the Disclosing Firm's Pricing Power. We reason that the concentration (or its obverse, diversification) of a firm's sales (purchases) among major customers (suppliers) can be contingent on the firm's pricing power—its ability to price its offerings above marginal costs. We thus explore pricing power as a relevant firm-year-specific characteristic that can explain heterogeneity in the effects of CSR disclosure. A priori, we expect CSR disclosure to be effective for a firm with high (vs. low) pricing power. The intuition is that a firm with greater pricing power dominates the marketplace on both sides of the supply chain (Johnson, 1966). If such a firm discloses its CSR, such disclosure is driven more likely by altruism than by impressing stakeholders (Chen et al., 2022).

Indeed, we find (Table C3) that CSR disclosure decreases (increases) dependence on major customers (major suppliers) for only the firms that have high pricing power. The finding suggests that CSR disclosure is informational only when made by firms with high pricing power.

4.5.4 Heterogeneity by Industry Concentration. An industry with lower sales concentration means that customers and suppliers have ample alternatives and can switch to rivals when an adverse event occurs. The lower switching costs make a firm in such an industry pay greater attention to its competitors. In this context, CSR disclosure can help a firm achieve a competitive advantage (Dhaliwal et al., 2011; Turban and Greening, 1997) and lower its risks (El Ghouli et al., 2011). Such a firm

will thus be more attractive to *nonmajor* and *prospective* customers when market competition is intense, decreasing the firm's dependence on the major customers. On the other hand, the firm's "doing good" boosts the confidence of its major suppliers and further solidifies the relations between the firm and its major suppliers when facing high market competition. Building on these arguments, we explore heterogeneity in our two main effects by industry concentration.

The evidence supports our argument. That is, we find that the CSR disclosure effects exist for firms only in industries characterized by a low concentration of sales revenue (as shown in Table C4).

4.5.5 Heterogeneity by Government Ownership. A unique characteristic of public firms in China is that most of them have the Government of China as the majority shareholder (Chen et al., 2018). This characteristic becomes particularly salient in our substantive context because the SHSE and SZSE are owned by the government, and thus their mandate indicates the government's will. One might thus expect that the impacts of the disclosure may vary by whether the mandated firm is owned by the government. Indeed, research that has used this CSR disclosure mandate has examined heterogeneity by ownership. We follow this literature to explore heterogeneity.

Two opposing theoretical perspectives inform whether the disclosure's impacts would be stronger or weaker for government-owned firms. First, on average, a government-owned firm is less efficient than its nongovernment-owned counterpart (Chen et al., 2018). This efficiency logic thus posits that the effects of CSR disclosure on dependence on major customers/suppliers will be weaker for government-owned firms. Second, government-owned firms undertake some of the government's responsibilities and may thus be more effective at social responsibility than their nongovernment counterparts (Liu and Tian, 2021; Wang et al., 2018). The effectiveness perspective thus suggests that the effects of CSR disclosure on dependence will be stronger for government-owned firms.

Following prior research (Chen et al., 2018), we partition our sample into two subsamples based on whether the Government of China is the firm's ultimate controller.¹⁵ Results (Table C5) suggest that the negative effect of a firm's CSR disclosure on its dependence on major customers holds for only government-owned firms, supporting that effectiveness logic overrides the efficiency perspective. Further, the effect on dependence on major suppliers does not vary by whether the firm is government-owned, indicating that the efficiency argument cancels the effectiveness logic. Because dependence is an unfavorable outcome for the firm, the substantive insight is that the benefit of CSR disclosure (i.e., negative effect on dependence on major customers) is limited to government-owned firms, whereas the cost (i.e., positive effect on dependence on major suppliers) applies to government- and nongovernment-owned firms.

4.6 Supplementary Analysis: Does Dependence Help or Hurt Firm Financial Outcomes?

We have thus far assumed that dependence is—on average—an unfavorable outcome for the firm. We next offer a correlational analysis to test our assumption. Four reasons drive our choice of trade credit as the financial performance variable.

First, because dependence is a bilateral variable—that is, it relates a firm to its customers or its suppliers—we prefer a financial performance variable that measures a firm’s performance concerning its supply-chain partners. Trade credit fits this preference. Specifically, a firm’s credit sales result from its relations with its customers (Astvansh and Jindal, 2022; Frennea et al., 2019). Similarly, the firm’s credit purchases result from its relations with its suppliers (Astvansh and Jindal, 2022). Thus, these two components of a firm’s trade credit align naturally with its dependence on major customers and its dependence on major suppliers. Relatedly, our dependence variables are on the supply chain’s two sides. The two components of trade credit—credit sales and credit purchase—mimic the two sides and thus offer a holistic picture of the firm’s supply chain performance.

Second, trade credit is immensely consequential. At the end of Q3 2023, trade receivables amounted to US\$ 4.7 trillion (<https://fred.stlouisfed.org/series/TRABSNNCB>), whereas trade payables amounted to US\$ 3.35 trillion (<https://fred.stlouisfed.org/series/TPLBSNNCB>). Indeed, OM academics (e.g., Astvansh and Jindal, 2022; Chod, 2017; Yang and Birge, 2018) have started paying greater attention to this variable that intersects accounting, finance, management, marketing, and OM.

Third, just like dependence can be “good” and “bad,” prior research has shown that a firm’s trade credit can bolster its accounting returns and financial outcomes (Astvansh and Jindal, 2022; Frennea et al., 2019) and impede them (Astvansh and Jindal, 2022). Theoretically, trade credit offers return and risk. The “return” perspective posits that by selling on credit, the firm invests in its customer relations and thus builds its relationship equity (Astvansh and Jindal, 2022; Frennea et al., 2019). In contrast, the “risk” view states that by selling on credit, the firm is incurring the risk that its customers may pay late or not pay at all, and thus the firm exposes itself to the risk of defaulting on its own payments. These perspectives mimic when one considers a firm’s credit purchases. Specifically, by purchasing on credit, the firm benefits from its suppliers’ largesse and thus becomes dependent on them. Conversely, the firm saves its cash and can use it for financing alternative investments. Consistent with these arguments, academics have reported that a firm’s credit sales lower profit but raise stock return. Similarly, its credit purchases raise its profit but lower its stock return (Astvansh and Jindal, 2022).

Fourth, we use trade credit for pragmatic reasons as well. Prior research has shown that dependence impacts a firm’s

accounting returns (e.g., Patatoukas, 2012), financial performance (e.g., Fang et al., 2011), innovation (e.g., Chu et al., 2019), and OM outcomes (e.g., Ak and Patatoukas, 2016). In contrast, no study (to our knowledge) has examined the association between dependence and trade credit. Therefore, using trade credit as the firm’s financial performance outcome adds to the novelty of our findings.

We next offer the theoretical rationale on how a firm’s dependence could be associated with its trade credit. The more concentrated a firm’s sales (among customers)—that is, the more dependent the firm is on the customers for revenue—the more inclined it will be to sell its offerings on credit than on cash (Astvansh and Jindal, 2022). That is, the firm’s dependence on major customers raises its credit sales. Because the firm’s CSR disclosure lowers its dependence on its customers, it indirectly lowers its credit sales. As we noted earlier, a drop in credit sales could raise the firm’s profit but potentially lower its stock return (Astvansh and Jindal, 2022).

Now, consider the concentration of the firm’s purchases among suppliers. The higher this concentration—that is, the more dependent the firm is on its suppliers—the more inclined the firm will be to purchase its suppliers’ offerings on cash than on credit. That is, the firm’s dependence on suppliers lowers its credit purchases. Because the firm’s CSR disclosure amplifies its dependence on suppliers, the disclosure indirectly lowers the firm’s credit purchases. Again, as noted earlier, a drop in the firm’s credit purchases can lower its profit but raise its stock return.

Following Astvansh and Jindal (2022), we measure the firm’s *Credit sales* in a year as the ratio of its accounts receivable to its sales revenue in the same year. Table 5 reports the estimates. A firm’s dependence on its major customers is positively associated with its credit sales. In particular, a one standard deviation increase in a firm’s *Dependence on major customers* is associated with a 1.70% (0.078×0.231) increase in its *Credit sales*, representing an average of RMB 35.77m¹⁶ (\$5.34m) increase for the firms in our sample.

Next, we test whether a firm’s dependence on its major suppliers impacts its credit purchases. Again, following Astvansh and Jindal (2022), we measured *Credit purchases* in a year as the ratio of the firm’s accounts payables in the year to its purchase in the same year, where the purchase is calculated as the sum of the costs of goods sold plus the change in inventory. Table 5 presents the results. A firm’s dependence on its suppliers is negatively associated with its credit purchases. In terms of economic significance, a one standard deviation increase in a firm’s *Dependence on its major suppliers* is associated with a 1.14% (0.052×0.220) decrease in its *Credit purchases*, representing an average of RMB 19.57m¹⁷ (\$2.92m) drop in the received trade credit for the firms in our sample.

5 Discussion

The expansive CSR literature has paid little attention to whether, how, and why CSR disclosure impacts a firm’s

Table 5. Does a firm's dependence on major customers/suppliers associate with its credit sales/purchases?

	Credit sales (I)	Credit purchases (II)
Dependence on major customers	0.074** (2.33)	
Dependence on major suppliers		-0.052* (-1.86)
Size	0.057*** (5.41)	0.019 (1.24)
Age	0.027** (2.32)	-0.020 (-1.02)
Leverage	0.054 (1.40)	0.140*** (2.94)
Profitability	-0.313*** (-3.06)	-0.032 (-0.38)
Growth	-0.022*** (-3.67)	-0.030*** (-5.49)
Tobin's q	-0.004 (-0.96)	0.002 (0.57)
Largest shareholder's ownership	-0.068 (-1.44)	-0.152* (-1.86)
Constant	-1.058*** (-4.59)	-0.189 (-0.59)
Firm FEs	Yes	Yes
Year FEs	Yes	Yes
N	3227	2332
Adjusted R ²	0.228	0.091

Note: This table presents the effect of a firm's (1) *Dependence on its major customers* on its *Credit sales* and (2) *Dependence on its major suppliers* on its *Credit purchases*. *Dependence on major customers* is the ratio of the sum of the firm's sales revenue from its top five customers to its sales revenue from all its customers. *Dependence on major suppliers* is the ratio of the sum of the volumes of the firm's purchases from its top five suppliers to the volumes of its purchases from all its suppliers. *Credit sales (purchases)* is the ratio of the firm's accounts receivables (payables) in a year to its sales revenue (total purchases) in the same year. The *t* statistics are in parentheses below the coefficients, with the standard error clustered by firm.

*, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

supply-chain outcomes. Without such knowledge, OM academics cannot join the CSR conversation that is becoming increasingly consequential. The ripple effect on operations and supply chain managers is that they cannot make a business case for whether and why a firm receives operational benefits or incurs costs if it discloses its CSR. We fill this gap in academics' and managers' knowledge by testing whether an exogenous shock about CSR disclosure impacts a firm's dependence on major supply-chain partners (i.e., customers and suppliers), and the mechanism that each effect.

5.1 Theoretical Implications

Our findings contribute to three streams of literature.

First, while much evidence exists on the *consequences* of supply-chain dependence (e.g., Ak and Patatoukas, 2016; Kim and Henderson, 2015; Kim and Zhu, 2018), the discipline knows relatively much less about its *causes* (Chen et al., 2021; Feng et al., 2020; Leung and Sun, 2021). One might thus assume that a firm's responsibility toward society does not impact its dependence on supply-chain partners. We caution against such an assumption by documenting CSR disclosure as a novel cause of a firm's dependence on each side of the value chain. More importantly, we extend the supply-chain dependence literature by showing *why* CSR disclosure produces this impact. Prior research has theorized that a firm's CSR disclosure is new and better information for its stakeholders (Hung et al., 2013; Wang et al., 2018). We extend this theory to reason that the information would serve the firm's supply-chain partners as well. That is, the firm's CSR disclosure lowers its supply-chain partners' information asymmetry. When equipped with new and better information, the firm's existing customers and suppliers prefer the firm as a partner, while prospective customers and suppliers become aware of the firm. As a result, the firm becomes more efficient in converting its production inputs to product outputs. An increase in the firm's production efficiency facilitates it to diversify its sales (among customers), thus lowering its dependence on major customers (for revenue). In parallel, the firm becomes more efficient in converting its marketing inputs to sales. This increase in the firm's marketing efficiency causes the firm to purchase more supplies from its major suppliers, thus increasing the firm's dependence on its major suppliers. This theory and the accompanying empirical evidence extend academics' knowledge of supply-chain dependence.

Second, the extant literature on CSR disclosure focuses on the benefits and costs of a firm's CSR concerning employees, peers, consumers, investors, and journalists. Consequently, CSR academics and managers may overlook how and why CSR may impact a B2B firm's outcomes concerning its customers and suppliers. Our primary finding—a B2B firm's CSR disclosure lowers its dependence on major customers but raises its dependence on major suppliers—is nonobvious and thus a novel contribution to the CSR disclosure literature. This finding suggests that disclosure is not empty rhetoric (Hung et al., 2013) and that it provides nonfinancial information that impacts the distribution of the firm's sales among customers and the distribution of its purchases among suppliers. We reason and demonstrate that these effects exist because CSR disclosure makes the firm more efficient in its use of resources.

5.2 Managerial Implications

Our findings are consequential to managers of CSR, supply-chain relations, and corporate finance.

First, our finding that a firm's CSR disclosure lowers its dependence on major customers is useful for sales account managers looking for ways to diversify their firm's sales across

multiple accounts. Similarly, the finding that the firm's CSR disclosure raises its dependence on major suppliers alerts purchasing managers from basking in the glory of CSR disclosure because it can raise the firm's dependence on suppliers. Interestingly, the favorable effect of CSR is a marginal 2.1%, whereas its unfavorable effect is a substantial 3.7%.

Second, we inform managers of not only the direction and magnitude of the effects but also why those effects exist. Specifically, we report that a firm's CSR disclosure boosts its production efficiency, lowering its dependence on major customers. Importantly, production efficiency explains 39% of the total effect of CSR disclosure on dependence on major customers. Mimicking this line of thought, we show that the firm's marketing efficiency explains why its CSR disclosure lowers its dependence on major suppliers. Marketing efficiency explains 8.2% of the total effect. Knowing the reasons for an effect is consequential for managers because they can devise strategies that bolster the mechanism that facilitates positive outcomes and control the mechanism that bolsters negative outcomes. Managers should work with sales/purchasing managers and monitor changes in their firm's sources of sales and purchases because these changes could haunt the firm.

Third, our heterogeneity analyses offer nuances on what types of firms are more likely to experience the effects. For example, CSR disclosure suppresses the dependence on major customers/suppliers for firms that spend less (than the median) on marketing, indicating that CSR disclosure and marketing are substitutes. Managers may use this finding and lower their marketing spending to appropriate the benefit of CSR disclosure. We also report that the effects of CSR disclosure exist only for firms with high pricing power and in industries characterized by low sales concentration (or high competition). The insight is that CSR disclosure matters for firms that can compete. Firms can leverage this insight to tailor their CSR disclosure to the competitiveness in their product markets.

5.3 Limitations and Future Research

We highlight two limitations of our research, each paving the path for future research. First, we ask: Does a firm's CSR disclosure impact its dependence on its major customers/suppliers? We emphasize the word disclosure because it is unlike the expansive literature that measures the effects of CSR performance.¹⁸ An empirical answer to this question requires a context where the disclosure was exogenous and unanticipated—that is, not voluntary. China is the only setting where (1) the disclosure was purportedly exogenous and unanticipated, and (2) data on firm-year-specific variables are available to allow an empirical analysis. Importantly, the United States—a usual context for most research—does not have a CSR mandate that we could leverage. Our empirical setting is thus limited in two ways. First, the 2008 mandate is dated and thus raises concerns about whether the effect would generalize to recent times. Second, because the mandate applies to firms listed on two exchanges in China, one would

question whether our findings apply to other institutional contexts. We explored alternate contexts but could not find any. As and when governments in other countries enact similar policy mandates, academics may consider testing our theory in these alternate settings.

Second, we are supply-chain academics and thus focused on the effect of CSR disclosure on supply-chain dependence. Academics can measure the effects of the disclosure on other OM-relevant outcomes, such as slack and leanness.

In summary, our research offers novel contributions to the literature on supply-chain dependence and CSR disclosure and relevant guidance to managers while opening avenues for future research.

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Notes

1. CSR is “the commitment of a business to contribute to sustainable economic development, working with employees, their families, the local community, and society at large to improve their quality of life” (Servaes and Tamayo, 2013: 1046).
2. A firm's customer is classified as a “major customer” in a year if the firm received a “large” proportion of its annual sales revenue from the focal customer in the focal year (Saboo et al., 2017). The measure of “large” varies by countries. For example, the Statement of Financial Accounting Standards (SFAS) 131—applicable to U.S. public firms—measures large as more than 10%, whereas CSRC measures it as a customer that appears in top five customers that the firm lists in its annual filing.
3. CSRC requires a public firm to report the name of and sales revenue from each of its top five customers. Similarly, it requires the firm to disclose the name of and purchases from each of its top five suppliers. Therefore, we consider these top five customers as

- “major” customers and top five suppliers as “major” suppliers. The CSRC’s requirement of “top five” is parallel to SFAS 131 (SFAS 14 until 1997) requirement that a U.S. public firm must report the sales revenue it receives from each customer that accounts for more than 10% of the firm’s annual sales revenue (<https://www.fasb.org/page/PageContent?pageId=/reference-library/superseded-standards/summary-of-statement-no-131.html>). The SFAS places no such requirement for U.S. public firms’ suppliers.
4. Appendix A of the e-companion provides the detailed information of the mandate. Because both exchanges are owned by the national government of China, the mandate can be deemed as an expression of the government’s will.
 5. The member firms of the SHSE Corporate Governance Index and the SHENZHEN 100 Index change slightly yearly. Therefore, following Chen et al. (2018), we define treatment firms to be the firms that were required to disclose CSR reports every year from 2009 to 2012.
 6. In unreported analyses, we test in three ways whether firms anticipated the mandate. First, a parallel trend analysis reports no significant difference in the dependence on major customers/suppliers in the premandate period (2005 through 2007). Second, if firms could anticipate the mandate, the treatment firms would have conducted more CSR activities (which would have lifted their CSR performance (CSP)) in the premandate period compared to their nonmandated peers. We tested this logic using employee welfare, corporate fraud, and pollution discharge. We find no difference in these three measures between mandated firms and their nonmandated peers.
 7. SHSE and SZSE label as ST (ST*) firms that report a negative net profit for two (three) consecutive years. Once a firm’s stock receives the label ST or ST*, fluctuation in its price is limited to 5%. This limit is lower than the typical limit of 10% for the Chinese A-share market.
 8. Because some firm-years do not have values for our main dependent variables (dependence on major customers and dependence on major suppliers), the actual firm-years involved in the regression is 3228 (2758) with the dependent variable is dependence on major customers (suppliers).
 9. We manually examine the top five customers and suppliers of each firm, and exclude those who are also mandated to disclose CSR information during the sample period. We thank an anonymous reviewer for this suggestion.
 10. SHSE’s and SZSE’s selection of firms is nonrandom. Our reviewers raised concerns that the treatment and control groups’ firms may systematically differ on their (1) closeness with the central government and (2) morality. In response to these comments, we included three more covariates in our PSM regression. (1) *Central* equals 1 if the focal firm is ultimately controlled by the central government, and 0 otherwise. (2) *Fraud* equals 1 if the focal firm committed accounting fraud in the focal year, and 0 otherwise. (3) *Employee salary* is the natural logarithm of average employee salary in the focal firm. We re-estimated our regression with the new PSM sample. Our main findings remain (results available from the first/lead author). We thank the reviewers for asking us to include these three covariates.
 11. Also plausible is that (1) production efficiency mediates the link *CSR disclosure* → *Dependence on major suppliers* and (2) marketing efficiency mediates the link *CSR disclosure* → *Dependence on major customers*. In results that are untabulated in the paper but reported in the revision notes, we tested these mediations, but neither was significant.
 12. The industry is classified by the 2012 CSRC classification. We use two-digit CSRC code for the manufacturing industry and one-digit CSRC code for other industries.
 13. A firm’s resources from previous years can affect its current year’s sales. Therefore, we follow Dutta et al. (2005) and use a Koyck lag function to calculate resource stock. We use a weight of 0.5 for stock of SG&A expenses, a weight of 0.4 for patent stock, and a weight of 0.5 for stock of previous years’ sales.
 14. In results unreported in the paper but submitted in our revision notes to the review team, we decomposed *Supply-chain emphasis* into *Supplier emphasis* and *Customer emphasis* and re-estimated the regression including *Treatment* × *Post* × *Supplier emphasis*, and *Treatment* × *Post* × *Customer emphasis*. The estimated coefficients of these two terms are negative. That is, the evidence is consistent with that reported in Table C1.
 15. China-based public firms must report their *ultimate controlling owner* in their annual reports.
 16. Calculated as $0.074 \times 0.231 \times 0.142$ (sample mean of credit sales) × 1.48×10^{10} (Mean value of sales, the denominator of credit sales).
 17. Calculated as $0.052 \times 0.220 \times 0.183$ (sample mean of credit purchases) × 9.35×10^9 (Mean value of the sum of cost of goods sold and change in inventory, the denominator of credit purchases).
 18. First, in analyses that are unreported in the paper but included in our revision notes to the review team, we test whether our finding is driven by CSR disclosure or CSR performance (CSP). We collected CSP ratings from the Hexun database and the Chinese Research Data Services (CNRDS) database. We find that CSP ratings from neither database are associated with a firm’s dependence on its customers/suppliers, confirming that our identified effect is unrelated to CSP. Second, we test whether our identified effect varies by the firm’s CSP. Results suggest that our effect varies by none of the six dimensions of CSP recorded in CNRDS, further suggesting that CSR disclosure and CSR performance do not interact to impact supply-chain dependence. Third, our focus on exogenous shock makes us believe that a firm’s voluntary disclosure of its CSR does not help us *identify* our effect. We test our belief by creating an alternate control group that includes control firms that voluntarily disclosed their CSR in the posttreatment years. The analysis (reported in the revision notes) documents that the effects are dissimilar to what we report using the clean control sample for clean identification.

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