How and Why Does a B2B Firm's CSR Disclosure Impact Its Dependence on its Major Customers and Major Suppliers?

Forthcoming in *Production and Operations Management* (*POM*)

Min Bai
Assistant Professor, School of Economics and Management,
University of Science & Technology Beijing,
No. 30 Xueyuan Road, Haidian District, Beijing, P.R. China
(86) 19520497850 | minb@163.com
https://sem.ustb.edu.cn/szll/szdw/szm/qb/bmc/index.htm

Vivek Astvansh*
Associate Professor of Quantitative Marketing and Analytics
Desautels Faculty of Management, McGill University, Canada
vivek.astvansh@mcgill.ca

Academic Director,
Bensadoun School of Retail Management, McGill University, Canada

Adjunct Associate Professor of Data Science,
Department of Informatics, Luddy School of Informatics, Computing, and Engineering,
Indiana University Bloomington

Faculty Affiliate, Environmental Research Institute
Indiana University Bloomington

* Both authors contributed equally. Their names are listed in reverse alphabetical order.

How and Why Does a B2B Firm's CSR Disclosure Impact Its Dependence on its Major Customers and Major Suppliers?

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

1. Introduction

A firm discloses its corporate social responsibility (CSR[1]) 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 & Salazar 2006), and the disclosure may reveal proprietary information to the firm's rivals and thus hurt its outcomes (e.g., Chen, Tian, & Yu 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, Hung, & Wang 2018; Lu et al. 2021; Ren et al. 2020). Others have documented that the firm's CSR disclosure lowers its cost of debt (Xu, Xu, & Yu 2021) and systematic risk (Amadi & 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 (Buell & Kalkanci 2021; Hung, Shi, & Wang 2013; Wang, Cao, & Ye 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 manuscript 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, Funk & McDonald 2017; Nickerson et al. 2022) and operations management (OM) (Buell & 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.

---

[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 & Tamayo 2013, p. 1046).

The question is theoretically interesting because the concentration of sales is a double-edged sword. It can benefit the firm (e.g., Kalwani & 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 major[2] customers, its sales revenue gets further "concentrated" (Ak & Patatoukas 2016; Patatoukas 2012). Such concentration raises the firm's *dependence* (for sales revenue) on major customers (Dhaliwal et al. 2016; Kim & Henderson 2015; Kim & 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 & 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, Shi, & Wang 2013; Wang, Cao, & Ye 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, Saboo, & Xiong 2022; Mishra, Modi, & Wiles 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 & 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

---

[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, Kumar, & Anand 2017). The measure of "large" varies by countries. For example, the Statement of Financial Standards (SFAS) 131—applicable to U.S. public firms—measures large as more than 10%, whereas China Securities Regulatory Commission (CSRC) measures it as a customer that appears in top five customer that the firm lists in its annual filing.

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 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, Hung, & Wang 2018; Lu et al. 2021; Wang, Cao, & Ye 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 (read 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 four-year premandate period and 2009-2012 as the four-year postmandate period.

We measure a firm's *dependence on major customers* in a year (our dependent variable #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, Kumar, & Anand 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, Shi, & Wang 2013; Wang, Cao, & Ye 2018). We reason that this increase in preference and awareness would make the

---

[3] China Securities Regulatory Commission (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 Statement of Financial Accounting Standards (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.

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, Saboo, & Xiong 2022; Mishra, Modi, & Wiles 2022). Mediation tests (e.g., Astvansh & Jindal 2022; Zhao, Lynch, & Chen 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, Judd, & Pandit 2021; Feng, Patel, & Sivakumar 2020; Leung & 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 & 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 (SASAC) issuing *Guidelines to the State-owned Enterprises Directly under the Central Government* that incentivizes Central State-owned Enterprises (CSOEs) 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, Hung, & Wang 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 Shanghai Stock Exchange (SHSE), and the Shenzhen Stock Exchange (SZHE), *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 SZHE 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, Hung, & Wang 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, 20008, 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

---

[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.

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 verify[6]—that firms are unlikely to have anticipated this mandate. Consequently, following prior research (Chen, Hung, & Wang 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 Shanghai Stock Exchange 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/TS116949 in 2010. Further, Xiamen Tungsten showed in their 2011 report that they successfully passed the OHSAS18000 certification for occupational safety. In the meanwhile, they integrated their quality assurance (i.e., ISO 9000), environmental management (i.e., ISO14000), and occupational safety (i.e., OHSAS18000) 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.

---

[5] The member firms of the SHSE Corporate Governance Index and the SHENZHEN 100 Index change slightly yearly. Therefore, following Chen, Hung, & Wang (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 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.

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, Dou, & Zhang 2020; Wang, Cao, & Ye 2018), thus boosting transparency between the firm and its stakeholders (Hung, Shi, & Wang 2013; Wu, Zhao, & Chen 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, Zhang, & Si, 2022; Ni & Zhang, 2019). However, the disclosure boosted the firm's investment efficiency (Liu & Tian 2021; Makosa et al. 2020; Zhong & Gao 2017), R&D spending (Nguyen, Chen, & Wang 2020), and patent applications (Ren et al. 2022; Zhang 2022).

Interestingly, the disclosure generated positive social externalities, such as fewer workplace fatalities (Chen, Hung, & Wang 2018) and a decrease in the pay gap between managers and rank-and-file employees (Huang, Yu, & Zhang 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, Hung, & Wang 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 & Kalkanci 2021; Nickerson et al. 2022).

3. Method

3.1. Sample

Following prior research (e.g., Chen, Hung & Wang 2018; Ren et al. 2023; Lu et al. 2021), 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 four

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, Hung & Wang 2018; Ren et al. 2023; Lu et al. 2021), 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 two or three 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 (CSMAR) database. Following research in marketing (e.g., Lim, Tuli, & Grewal 2020) and OM (e.g., Astvansh & 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 four years (2005 to 2008) in the premandate period and the four years (2009 to 2012) in the postmandate firms. We thus expect $278 \times 4 = 1,112$ 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 1,005 observations in the premandate period and 1,082 in the postmandate period, totaling 2,087 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 to 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, Hung & Wang 2018; Ren

---

[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).

et al. 2023; Lu et al. 2021), we address this potential bias by using the propensity score matching (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 to 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, Hung, & Wang (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.

Table 1: Variable Key

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.

Description	Name	Role	Measure
Dependence on major customers	*Dependence on major customers$_{i,t}$*	Primary outcome variable	$Dependence\ on\ major\ customers_{i,t}$ $$= \frac{\sum_{j=1}^{5}(sale_{i,j,t})}{sale_{i,t}}$$ Subscript *j* indexes *i*'s top five customers in year *t* *References:* Dhaliwal et al. (2016); Jiang et al. (2023)

Dependence on major suppliers	*Dependence on major suppliers$_{i,t}$*	Primary outcome variable	$Dependence\ on\ major\ suppliers_{i,t}$ $$= \frac{\sum_{j=1}^{5}(purchase_{i,j,t})}{purchase_{i,t}}$$ Subscript *j* indexes *i*'s top five suppliers in year *t*. *References*: Casalin et al. (2017); Jiang et al. (2023)
Treatment	*Treatment$_i$*	Explanatory variable	= 1 if SHSE/SHZE mandated the focal firm to disclose a CSR report each year starting 2009, and 0 otherwise *Reference*: Chen, Hung, & Wang (2018); Lu et al. (2021)
Post	*Post$_t$*	Explanatory variable	= 1 for the years 2009 through 2012, and 0 for the years 2005 through 2008 *References*: Chen, Hung, & Wang (2018); Lu et al. (2021)
Supply-chain emphasis in the CSR report	*Supply-chain emphasis in the CSR report$_{i,t}$*	Alternate explanation (moderator variable)	$Supply\ chain\ emphasis\ in\ the\ CSR\ report_{i,t}$ $$= \frac{Ratio_{i,t} - Mean\_ratio_t}{Sd\_ratio_t}$$ *Ratio$_{i,t}$* is the proportion of supply chain terms in the firm *i*'s report year *t* (the management discussion and analysis [MD&A] section of the annual report in premandate years, and CSR report (for postmandate years). *Mean_ratio$_t$* and *Sd_ratio$_t$* are the mean for the *Ratio* and the standard deviation around the mean of the *Ratio* for all firms in our sample in *t*.
Marketing efficiency	*Marketing efficiency$_{i,t}$*	Mechanism variable	$\ln(Sales_{i,t})$ $= \alpha_0 + \beta_1 \ln(Stock\ of\ SGA\ expenses_{i,t})$ $+ \beta_2 \ln(Stock\ of\ patents_{i,t})$ $+ \beta_3 \ln(Stock\ of\ previous\ years'\ sales_{i,t})$ $+ \beta_4 \ln(Stock\ of\ goodwill_{i,t}) + Industry + a_i$ $+ \varepsilon_{i,t}$ *Reference*: Chakravarty, Saboo, & Xiong (2022)
Production efficiency	*Production efficiency$_{i,t}$*	Mechanism variable	$\ln(Valuadded_{i,t})$ $\qquad = \alpha_0 + \beta_1 \ln(PPE_{i,t})$ $\qquad + \beta_2 \ln(Inventory_{i,t})$ $\qquad + \beta_3 \ln(Employees_{i,t})$ $\qquad + Industry + a_i + \varepsilon_{i,t}$ *Reference:* Mishra, Modi, & Wiles (2022)

Credit sales	*Credit sales$_{i,t}$*	Secondary (firm performance) outcome variable	$Credit\ sales_{i,t} = \dfrac{Accounts\ receivable_{i,t}}{sales_{i,t}}$ *Reference:* Astvansh & Jindal (2022)
Credit purchases	*Credit purchases$_{i,t}$*	Secondary (firm performance) outcome variable	$Credit\ purchases_{i,t}$ $= \dfrac{Accounts\ payable_{i,t}}{Cost\ of\ goods\ sold_{i,t} + \Delta inventory_{i,t}}$ *Reference:* Astvansh & Jindal (2022)
Marketing	*Marketing$_{i,t}$*	Heterogeneity (subsampling)	$Marketing_{i,t} = \dfrac{SGA\ expenses_{i,t}}{Total\ assets_{i,t}}$ *Reference*: Banker et al. (2019)
Pricing power	*Pricing power$_{i,t}$*	Heterogeneity (subsampling)	$Pricing\ power_{i,t} =$ $\dfrac{Operating\ income_{i,t} - Operating\ costs_{i,t} - Selling\ expenses_{i,t} - administrative\ expenses_{i,t}}{Operating\ income_{i,t}}$ *Reference:* Xiong, Deng & Xiao (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, Klasa, & Yeung (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	$Leverage_{i,t} = \dfrac{Total\ liabilities_{i,t}}{Total\ assets_{i,t}}$
Sales growth rate	*Growth$_{i,t}$*	Control	$Growth_{i,t} = \dfrac{Sale_{it} - Sale_{i,t-1}}{Sale_{i,t-1}}$
Tobin's q	*Tobin's q$_{i,t}$*	Control	$Tobin's\ q_{i,t} = \dfrac{Market\ value_{i,t}}{Total\ assets_{i,t}}$
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	$Profitability_{i,t} = \dfrac{Net\ income_{i,t}}{Total\ assets_{i,t-1}}$
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*	Matching	The natural logarithm of one plus the analyst

	$coverage_{i,t}$	variable	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

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, Hung, & Wang 2018). We set the caliper to a .25 standard deviation of the propensity score (Chen, Hung, & Wang 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 four years (2005 to 2008) in the premandate period and the four years (2009 to 2012) in the postmandate firms. We thus expect $258 \times 4 =$ 1,032 in each period. However, because some observations do not have values for one or more of the eight control variables, our control group includes 926 observations in the premandate period and 972 in the postmandate period, totaling 1,898 observations in both periods.

Table 2: Effectiveness of the PSM

Note: This table represents 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 lines 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 line 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 line indicates the significance of the difference.

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*

3.2.2 Empirical model

To measure the impact of CSR disclosure on supply-chain dependence, we follow Chen, Hung, & Wang (2018) and Lu et al. (2021) and employ a difference-in-differences (DiD) method to the matched sample. Our two DiD regressions—one for each of the two outcomes of interest—follow.

(1) $Dependence\ on\ major\ customers_{i,t}$
$$= \beta_0 + \beta_1(Treatment_i \times Post_t) + \beta_2 Controls_{i,t} + Firm_i + Year_t + \varepsilon_{i,t}$$

(2) $Dependence\ on\ major\ suppliers_{i,t}$
$$= \beta_0 + (\beta_1 Treatment_i \times Post_t) + \beta_2 Controls_{i,t} + Firm_i + Year_t + \varepsilon_{i,t}$$

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, Kumar, & Anand 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). $Treatment \times Post$ 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 difference-in-differences). Stated simply, β_1 in Equations (1) and (2) captures the difference-in-differences (causal) effect of the CSR disclosure.

Controls include firm-level covariates that prior literature has used to explain supply-chain dependence (Kim & Lee 2020; Leung & 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).

---

[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.

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 .274 and .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 .539 and .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 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.

Table 3: CSR disclosure and supply-chain dependence

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 SHZE 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.

	Dependence on major customers	Dependence on major suppliers	Dependence on major customers	Dependence on major suppliers
	(I)	(II)	(III)	(IV)
			Testing alternate explanation that the effect is driven by CSR *activities* and not mere *disclosure* of CSR	
Treatment × Post	-0.021**	0.037***	-0.021*	0.037***
	(-2.00)	(2.79)	(-1.92)	(2.74)
Size	-0.010	-0.034**	-0.010	-0.034**
	(-0.85)	(-2.47)	(-0.84)	(-2.48)
Age	0.012	-0.005	0.012	-0.005
	(0.86)	(-0.32)	(0.86)	(-0.32)
Leverage	-0.061	-0.060	-0.061	-0.059
	(-1.38)	(-1.17)	(-1.39)	(-1.16)
Profitability	0.066	0.007	0.064	0.008

[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.

	(0.65)	(0.06)	(0.64)	(0.07)
Growth	0.006	-0.005	0.006	-0.005
	(0.96)	(-0.72)	(0.96)	(-0.73)
Tobin's q	0.002	0.004	0.002	0.004
	(0.48)	(0.77)	(0.49)	(0.76)
Largest shareholder's ownership	0.016	-0.093	0.016	-0.093
	(0.24)	(-1.27)	(0.24)	(-1.26)
CSR spend			-0.139*	0.149
			(-1.85)	(0.73)
Constant	0.533**	1.182***	0.505**	1.185***
	(2.09)	(4.12)	(1.97)	(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

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 & Dacin 1997; Du, Bhattacharya, & Sen 2011; Servaes & Tamayo 2013). The increased preference and awareness allow the firm to lower the concentration of—or diversify— its sales among customers (Buell & 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 & 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 −.021 and .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 Colum 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 result 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, Modi, and Wiles 2022). Next, prior research (e.g., Bhattacharya, Morgan, and Rego 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, Modi, and Wiles (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 property, plant, and equipment, (2) the monetary value of inventory, and (3) the number of employees. The model is specified as follows:

$$(3) ln\,(Value\_added_{i,t}) = \alpha_0 + \beta_1 \ln(PPE_{i,t}) + \beta_2 \ln(INV_{i,t}) + \beta_3 \ln(EMP_{i,t}) + Industry + a_i + \varepsilon_{i,t}$$

$Value\_added_{i,t}$ is the difference between sales revenues and costs of goods sold for firm i in year t. $PPE_{i,t}$ is the monetary value of property, plant, and equipment for firm i in the year t. $INV_{i,t}$ is the monetary value of inventory for firm i in the year t. $EMP_{i,t}$ is the number of employees for firm i in the year t. $Industry$ is the firm's China Securities Regulatory Commission (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, Lynch, and Chen 2010) and OM (e.g., Astvansh and Jindal 2022). We begin by testing CSR disclosure → production efficiency → dependence on major customers. That is, we estimate a mediation model, which comprises two regressions, estimated simultaneously. The first regression (Equation 4 below) regresses a firm's *Production efficiency* on its CSR disclosure (i.e., *Treatment × Post*). The second regression (Equation 5 below) regresses the firm's *Dependence on major customers* on *Treatment × Post* and *Production efficiency*. The estimated coefficient of *Treatment × 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 CSR disclosure on its *Dependence on major customers*.

---

[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 manuscript 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.

(4) $Production\ efficiency_{i,t}$

$$= \gamma_0 + \gamma_1(Treatment_i \times Post_t) + \gamma_2 Controls_{i,t} + Firm_i + Year_t + \varepsilon_{i,t}$$

(5) $Dependence\ on\ major\ customers_{i,t} = \theta_0 + \theta_1(Treatment_i \times Post_t) +$
$\theta_2 Production\ efficiency_{i,t} + \theta_3 Controls_{i,t} + Firm + Year + \varepsilon_{i,t}$

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 −.023. Column (II) reports that a firm's CSR disclosure increases its *Production efficiency* by 4.9% ($b = .049$, $p < .01$). Column (III) shows that the firm's production efficiency is associated with a decline in its dependence on major customers ($b = −.185$, $p < .01$). After we control for the mechanism variable, the effect of CSR disclosure on dependence while staying statistically significant, decreases from −.023 to −.014. Therefore, the indirect effect of the firm's CSR disclosure on its dependence on major customers (via production efficiency) is $.049 \times −.185 =$ −.009, which amounts to 39% of the total effect of −.023.

Table 4: Resource efficiency as a mechanism

Note: This table reports whether (1) 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.

DVs =	Dependence on major customers	Production efficiency	Dependence on major customers	Dependence on major suppliers	Marketing efficiency	Dependence on major suppliers
	(I)	(II)	(III)	(IV)	(V)	(VI)
Treatment × Post	-0.023***	0.049***	-0.014**	0.034***	0.005***	0.031***
	(-3.21)	(12.71)	(-2.00)	(3.20)	(3.00)	(2.98)
Production efficiency			-0.185***			
			(-4.18)			
Marketing efficiency						0.511***
						(2.77)
Size	-0.010	0.018***	-0.006	-0.034***	-0.001	-0.033***
	(-1.05)	(4.27)	(-0.68)	(-3.04)	(-0.32)	(-3.06)
Age	0.011	0.018**	0.014	-0.008	0.005	-0.010
	(1.01)	(2.48)	(1.31)	(-0.36)	(1.30)	(-0.48)
Leverage	-0.058	0.010	-0.057	-0.056	0.019***	-0.066
	(-1.40)	(0.97)	(-1.35)	(-1.31)	(2.20)	(-1.59)
Profitability	0.067	-0.005	0.067	-0.008	0.025*	-0.020
	(0.73)	(-0.21)	(0.72)	(-0.08)	(0.99)	(-0.22)
Growth	0.006	-0.004**	0.006	-0.004	0.013***	-0.011
	(1.12)	(-2.58)	(0.99)	(-0.52)	(5.35)	(-1.36)
Tobin's q	0.0001	-0.001	-0.000	0.005	-0.001	0.005

	(0.05)	(-0.78)	(-0.03)	(0.93)	(-0.91)	(1.08)
Largest shareholder's ownership	0.008	0.072***	0.021	-0.094	-0.008	-0.090
	(0.15)	(3.75)	(0.40)	(-1.57)	(-0.73)	(-1.53)
Constant	0.279	2.34***	0.712***	0.989***	0.811***	0.575**
	(1.33)	(19.73)	(3.10)	(3.83)	(13.70)	(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 R²	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: Our sample has shrunk slightly because some firm-years do not have values for the efficiency measures.

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, Saboo, and Xiong (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 stocks[13] of (1) sales, general, and administration expenses, (2) patents, (3) prior sales (a measure of installed customer base), and (4) goodwill. The model is specified as follows:

$$(6) \ln(Sales\ revenue_{i,t})$$
$$= \alpha_0 + \beta_1 \ln(Stock\ of\ SGA\ expenses_{i,t}) + \beta_2 \ln(Stock\ of\ patents_{i,t})$$
$$+ \beta_3 \ln(Stock\ of\ prior\ sales_{i,t}) + \beta_4 \ln(Stock\ of\ goodwill_{i,t}) + Industry + a_i + \varepsilon_{i,t}$$

$Sales\ revenue_{i,t}$ is firm i's sales revenue in year t. $Stock\ of\ SGA\ expenses_{i,t}$ is the firm i's stock of sales, general, and administration expenses in year t. $Stock\ of\ patents_{i,t}$ is the firm i's stock of patents in year t. $Stock\ of\ prior\ sales_{i,t}$ measures the firm i's installed base of customers in year t. $Stock\ of\ goodwill_{i,t}$ 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., *Treatment × Post*). Equation 8 regresses the firm's dependence on major

---

[13] A firm's resources from previous years can affect its current year's sales. Therefore, we follow Dutta, Narasimhan, & Rajiv (2005) and use a Koyck lag function to calculate resource stock. We use a weight of .5 for stock of SGA expenses, a weight of .4 for patent stock, and a weight of .5 for stock of previous years' sales.

suppliers on *Treatment × Post* and *Marketing efficiency*. The estimated coefficient of *Treatment × Post* from this regression is the *direct* effect of the firm's CSR disclosure on its dependence on major suppliers.

$$(7)\ Marketing\ efficiency_{i,t}$$
$$= \gamma_0 + \gamma_1(Treatment_i \times Post_t) + \gamma_2 Controls_{i,t} + Firm_i + Year_t + \varepsilon_{i,t}$$

$$(8)\ Dependence\ on\ major\ suppliers_{i,t} = \theta_0 + \theta_1(Treatment_i \times Post_t) +$$
$$\theta_2 Marketing\ efficiency_{i,t} + \theta_3 Controls_{i,t} + Firm + Year + \varepsilon_{i,t}$$

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 .034. Column (V) reports that the effect of *Treatment × Post* on *Marketing efficiency* is positive and statistically significant ($b = .005$, $p < .01$), suggesting that a firm's CSR disclosure boosts its marketing efficiency by .5%. Column (VI) reports that the firm's marketing efficiency is positively associated with its dependence on major suppliers ($b = .511$, $p < .01$). After we control for the firm's marketing efficiency, the direct effect of its CSR disclosure on its dependence on major customers stays significant ($b = .031$, $p < .01$). 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 $.005 \times .511 = .003$, equivalent to 8.2% of the total effect of .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,

Supply-chain emphasis in the CSR report$_{i,t}$ = (*Ratio$_{i,t}$* − *Mean_ ratio$_t$*) ÷ *Sd_ ratio$_t$*. *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 *Treatment × Post × Supply-chain emphasis in the CSR report.*

Table C1 reports the results. As expected, the coefficients for *Treatment × Post × 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 & 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 & 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 & Wathieu 2017; Lloyd-Smith & 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

---

[14] In results unreported in the manuscript 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.

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, Tian, & Yu 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 & Greening 1997) and lower its risks (El Ghoul 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, Hung, & Wang 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, Hung, & Wang 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 & Tian 2021; Wang, Cao, & Ye 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, Hung, & Wang 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 & Jindal 2022; Frennea, Han, & Mittal 2019). Similarly, the firm's credit purchases result from its relations with its suppliers (Astvansh & 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

---

[15] China-based public firms must report their *ultimate controlling owner* in their annual reports.

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 & Jindal 2022; Chod 2017; Yang & 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 & Jindal 2022; Frennea, Han, & Mittal 2019) and impede them (Astvansh & 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 & Jindal 2022; Frennea, Han, & Mittal 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 & 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, Palmatier, & Grewal 2011), innovation (e.g., Chu, Tian, & Wang 2019), and OM outcomes (e.g., Ak & Patakouskas 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 & 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 & 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 & 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% (.078 × .231) increase in its *Credit sales*, representing an average of RMB 35.77 million[16] RMB ($5.34 million) 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 & 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 19.57 million[17] ($2.92 million) drop in the received trade credit for the firms in our sample.

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

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.

	Credit sales	Credit purchases
	(I)	(II)
Dependence on major customers	0.074**	
	(2.33)	
Dependence on major suppliers		-0.052*
		(-1.86)
Size	0.057***	0.019
	(5.41)	(1.24)
Age	0.027**	-0.020
	(2.32)	(-1.02)
Leverage	0.054	0.140***
	(1.40)	(2.94)
Profitability	-0.313***	-0.032

---

[16] Calculated as.074 ×.231 × .142 (sample mean of credit sales) × 1.48e+10 (Mean value of sales, the denominator of credit sales).

[17] Calculated as .052 ×.220 × .183 (sample mean of credit purchases) ×9.35e+9 (Mean value of the sum of cost of goods sold and change in inventory, the denominator of credit purchases).

	(-3.06)	(-0.38)
Growth	-0.022***	-0.030***
	(-3.67)	(-5.49)
Tobin's q	-0.004	0.002
	(-0.96)	(0.57)
Largest shareholder's ownership	-0.068	-0.152*
	(-1.44)	(-1.86)
Constant	-1.058***	-0.189
	(-4.59)	(-0.59)
Firm FEs	Yes	Yes
Year FEs	Yes	Yes
N	3227	2332
Adjusted R^2	0.228	0.091

5. Discussion

The expansive CSR literature has paid little attention to whether, how, and why CSR disclosure impacts a firm's *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 & Patakouskas 2016; Kim & Henderson 2015; Kim & Zhu 2018), the discipline knows relatively much less about its *causes* (Chen, Judd, & Pandit 2021; Feng, Patel, & Sivakumar 2020; Leung & 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, Shi, & Wang 2013; Wang, Cao, & Ye 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, Shi, and Wang 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

---

[18] First, in analyses that are unreported in the manuscript 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 is 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.

and CSR disclosure and relevant guidance to managers while opening avenues for future research.

References

Ailawadi, K. L., Neslin, S. A., Luan, Y. J., & Taylor, G. A. (2014). Does retailer CSR enhance behavioral loyalty? A case for benefit segmentation. *International Journal of Research in Marketing*, *31*(2), 156-167.

Ali, A., Klasa, S., & Yeung, E. (2014). Industry concentration and corporate disclosure policy. *Journal of Accounting and Economics*, 58(2-3), 240-264.

Ak, B. K., & Patatoukas, P. N. (2016). Customer-base concentration and inventory efficiencies: Evidence from the manufacturing sector. *Production and Operations Management*, *25*(2), 258-272.

Akerlof, G. A. (1970). The market for 'lemons': Quality and the market mechanism. *Quarterly Journal of Economics*. 84 (August), 488–500.

Amadi, C., & Zhu, Z. (2020). The Effect of Mandatory Corporate Social Responsibility (CSR) Disclosure on Corporate Financial performance in China: A DID Analysis. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3922295

Astvansh, V., & Jindal, N. (2022). Differential effects of received trade credit and provided trade credit on firm value. *Production and Operations Management*, *31*(2), 781-798.

Banerjee, S., & Wathieu, L. (2017). Corporate social responsibility and product quality: Complements or substitutes? *International Journal of Research in Marketing*, *34*(3), 734-745.

Banker, R. D., Huang, R., Natarajan, R., & Zhao, S. (2019). Market valuation of intangible asset: Evidence on SG&A expenditure. *The Accounting Review*, 94(6), 61-90.

Bhattacharya, A., Morgan, N. A., & Rego, L. L. (2022). Examining why and when market share drives firm profit. *Journal of Marketing*, 86(4), 73-94.

Brown, T. J., & Dacin, P. A. (1997). The company and the product: Corporate associations and consumer product responses. *Journal of Marketing*, *61*(1), 68-84.

Buell, R. W., & Kalkanci, B. (2021). How transparency into internal and external responsibility initiatives influences consumer choice. *Management Science*, *67*(2), 932-950.

Casalin, F., Pang, G., Maioli, S., & Cao, T. (2017). Inventories and the concentration of suppliers and customers: Evidence from the Chinese manufacturing sector. *International Journal of Production Economics*, *193*, 148-159.

Chakravarty, A., Saboo, A. R., & Xiong, G. (2022). Marketing's and Operations' roles in product recall prevention: Antecedents and consequences. *Production and Operations Management*, 31(3), 1174-1190.

Chen, Y. C., Hung, M., & Wang, Y. (2018). The effect of mandatory CSR disclosure on firm profitability and social externalities: Evidence from China. *Journal of Accounting and Economics*, *65*(1), 169-190.

Chen, G., Judd, J. S., & Pandit, S. (2021). Firm unionization and disruptions in customer relationships. *Contemporary Accounting Research*, 38(4), 2951-2981.

Chen, G., Tian, X. S., & Yu, M. (2022). Redact to protect? Customers' incentive to protect information and suppliers' disclosure strategies. *Journal of Accounting and Economics*, *74*(1), 101490.

Chod, J. (2017). Inventory, risk shifting, and trade credit. *Management Science*, *63*(10), 3207-3225.

Chu, Y., Tian, X., & Wang, W. (2019). Corporate innovation along the supply chain. *Management Science*, *65*(6), 2445-2466.

Dai, R., Liang., H., & Ng, L. (2021). Socially responsible corporate customers. *Journal of Financial Economics*, *142*(2), 598-626.

Dhaliwal, D. S., Li, O. Z., Tsang, A., & Yang, Y. G. (2011). Voluntary nonfinancial disclosure and the cost of equity capital: The initiation of corporate social responsibility reporting. *Accounting Review*, *86*(1), 59-100.

Dhaliwal, D., Judd, J. S., Serfling, M., & Shaikh, S. (2016). Customer concentration risk and the cost of equity capital. *Journal of Accounting and Economics*, *61*(1), 23-48.

Du, S., Bhattacharya, C. B., & Sen, S. (2011). Corporate social responsibility and competitive advantage: Overcoming the trust barrier. *Management Science*, *57*(9), 1528-1545.

Dutta, S., Narasimhan, O. M., & Rajiv, S. (2005). Conceptualizing and measuring capabilities: Methodology and empirical application. *Strategic Management Journal*, 26(3), 277-285.

El Ghoul, S., Guedhami, O., Kwok, C. C., & Mishra, D. R. (2011). Does corporate social responsibility affect the cost of capital? *Journal of Banking & Finance*, *35*(9), 2388-2406.

Fang, E., Palmatier, R. W., & Grewal, R. (2011). Effects of customer and innovation asset configuration strategies on firm performance. *Journal of Marketing Research*, 48(3), 587-602.

Feng, C., Patel, P. C., & Sivakumar, K. (2020). Chief global officers, geographical sales dispersion, and firm performance. *Journal of Business Research*, 121, 58-72.

Frennea, C., Han, K., & Mittal, V. (2019). Value appropriation and firm shareholder value: Role of advertising and receivables management. *Journal of Marketing Research*, *56*(2), 291-309.

Han, A. G. (2008). Building a harmonious society and achieving individual harmony. *Journal of Chinese Political Science*, *13*, 143-164.

Huang, H., Yu, L., & Zhang, J. (2022). Mandatory CSR Disclosure and Pay Gap: Evidence from China. *Emerging Markets Finance and Trade*, *58*(13), 3781-3812.

Hung, M., Shi, J., & Wang, Y. (2013). The effect of mandatory CSR disclosure on information asymmetry: Evidence from a quasi-natural experiment in China. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2206877.

Husted, B. W., & de Jesus Salazar, J. (2006). Taking Friedman seriously: Maximizing profits and social performance. *Journal of Management Studies*, *43*(1), 75-91.

Inoue, Y., Funk, D. C., & McDonald, H. (2017). Predicting behavioral loyalty through corporate social responsibility: The mediating role of involvement and commitment. *Journal of Business Research*, *75*, 46-56.

Jackson, G., Bartosch, J., Kinderman, D. P., Knudsen, J. S., & Avetisyan, E. (2017). Regulating self-regulation? The politics and effects of mandatory CSR disclosure in comparison. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2925055

Jiang, S., Yeung, A. C., Han, Z., & Huo, B. (2023). The effect of customer and supplier concentrations on firm resilience during the COVID-19 pandemic: resource dependence and power balancing. *Journal of Operations Management*, 69(3), 497-518.

Jiang, W., Zhang, C., & Si, C. (2022). The real effect of mandatory CSR disclosure: Evidence of corporate tax avoidance. *Technological Forecasting and Social Change*, *179*, 121646.

Johnson, O. (1966). Corporate philanthropy: An analysis of corporate contributions. *The Journal of Business*, *39*(4), 489-504.

Kalwani, M. U., & Narayandas, N. (1995). Long-term manufacturer-supplier relationships: do they pay off for supplier firms?. *Journal of Marketing*, 59(1), 1-16.

Kim, J. H., & Lee, W. M. (2020). How Does Board Structure Affect Customer Concentration?. https://papers.ssrn.com/sol3/Papers.cfm?abstract_id=3238644

Kim, Y. H., & Henderson, D. (2015). Financial benefits and risks of dependency in triadic supply chain relationships. *Journal of Operations Management*, *36*, 115-129.

Kim, D. Y., & Zhu, P. (2018). Supplier dependence and R&D intensity: The moderating role of network centrality and interconnectedness. *Journal of Operations Management*, *64*, 7-18.

Leung, W. S., & Sun, J. (2021). Policy Uncertainty and Customer Concentration. *Production and Operations Management*, *30*(5), 1517-1542.

Lim, L. G., Tuli, K. R., & Grewal, R. (2020). Customer satisfaction and its impact on the future costs of selling. *Journal of Marketing*, *84*(4), 23-44.

Liu, L., & Tian, G. G. (2021). Mandatory CSR disclosure, monitoring and investment efficiency: evidence from China. *Accounting & Finance*, *61*(1), 595-644.

Lloyd-Smith, P., & An, H. (2019). Are corporate social responsibility and advertising complements or substitutes in producing firm reputation? *Applied Economics*, *51*(21), 2275-2288.

Lu, T., Sivaramakrishnan, K., Wang, Y., & Yu, L. (2021). The real effects of mandatory corporate social responsibility reporting in China. *Production and Operations Management*, *30*(5), 1493-1516.

Luo, X., & Zheng, Q. (2013). Reciprocity in corporate social responsibility and channel performance: do birds of a feather flock together? *Journal of Business Ethics*, *118*, 203-213.

Makosa, L., Yang, J., Sitsha, L., & Jachi, M. (2020). Mandatory CSR disclosure and firm investment behavior: Evidence from a quasi-natural experiment in China. *Journal of Corporate Accounting & Finance*, *31*(4), 33-47.

Marketing Charts. (2024). The core problems CEOs want their marketing teams to solve. https://www.marketingcharts.com/business-of-marketing-232073

Mishra, S., Modi, S. B., & Wiles, M. A. (2022). Economic policy uncertainty and shareholder wealth: the role of marketing, operations, and R&D capabilities. *Journal of the Academy of Marketing Science*, 50(5), 1011-1031.

Nguyen, L. T., Chen, S., & Wang, J. (2020). The Impact of Mandatory CSR Disclosure on R&D Investment: A Quasi-Natural Experiment. In *Academy of Management Proceedings* (Vol. 2020, No. 1, p. 19360). Briarcliff Manor, NY 10510: Academy of Management.

Ni, X., & Zhang, H. (2019). Mandatory corporate social responsibility disclosure and dividend payouts: evidence from a quasi-natural experiment. *Accounting & Finance*, *58*(5), 1581-1612.

Nickerson, D., Lowe, M., Pattabhiramaiah, A., & Sorescu, A. (2022). The impact of corporate social responsibility on brand sales: An accountability perspective. *Journal of Marketing*, *86*(2), 5-28.

Petersen, M. A. (2009). Estimating standard errors in finance panel data sets: Comparing approaches, *Review of Financial Studies,* 22(1), 435-480.

Patatoukas, P. N. (2012). Customer-base concentration: Implications for firm performance and capital markets: 2011 American accounting association competitive manuscript award winner. *The Accounting Review*, *87*(2), 363-392.

Ren, S., Huang, M., Liu, D., & Yan, J. (2023). Understanding the impact of mandatory CSR disclosure on green innovation: Evidence from Chinese listed firms. *British Journal of Management*, 34(2), 576-594.

Ren, S., Wei, W., Sun, H., Xu, Q., Hu, Y., & Chen, X. (2020). Can mandatory environmental information disclosure achieve a win-win for a firm's environmental and economic performance? *Journal of Cleaner Production*, *250*, 119530.

Rezaee, Z., Dou, H., & Zhang, H. (2020). Corporate social responsibility and earnings quality: Evidence from China. *Global Finance Journal*, *45*, 1-21.

Saboo, A. R., Kumar, V., & Anand, A. (2017). Assessing the impact of customer concentration on initial public offering and balance sheet–based outcomes. *Journal of Marketing*, *81*(6), 42-61.

Servaes, H., & Tamayo, A. (2013). The impact of corporate social responsibility on firm value: The role of customer awareness. *Management Science*, *59*(5), 1045-1061.

She, G. (2022). The real effects of mandatory nonfinancial disclosure: evidence from supply chain transparency. *The Accounting Review*, *97*(5), 399-425.

The B2BHouse. (2023). B2B Marketing Statistics – Key Trends, Stats, and Strategies for 2024. https://www.theb2bhouse.com/b2b-marketing-statistics/#:~:text=In%20the%20US%2C%2023.6%25%20of,research%20before%20making%20a%20purchase.

Turban, D. B., & Greening, D. W. (1997). Corporate social performance and organizational attractiveness to prospective employees. *Academy of Management Journal*, *40*(3), 658-672.

Wang, X., Cao, F., & Ye, K. (2018). Mandatory corporate social responsibility (CSR) reporting and financial reporting quality: Evidence from a quasi-natural experiment. *Journal of Business Ethics*, *152*(1), 253-274.

Williamson Oliver E. (1991). Comparative economic organization: The analysis of discrete structural alternatives. *Administrative Science Quarterly*, 36 (2), 269–96.

Wu, C., Zhao, X., & Chen, Y. (2019). Does Mandatory CSR Disclosure Have an Impact on Stock Price Informativeness? *Academy of Management Proceedings* (Vol. 2019, No. 1, p. 14326). Briarcliff Manor, NY 10510: Academy of Management.

Xiong, L., Deng, H., & Xiao, L. (2021). Does stock market liberalization mitigate litigation risk? Evidence from Stock Connect in China. *Economic Modelling*, 102, 105581.

Xu, H., Xu, X., & Yu, J. (2021). The impact of mandatory CSR disclosure on the cost of debt financing: Evidence from China. *Emerging Markets Finance and Trade*, 57(8), 2191-2205.

Yang, S. A., & Birge, J. R. (2018). Trade credit, risk sharing, and inventory financing portfolios. *Management Science*, *64*(8), 3667-3689.

Zhang, H. (2022). Mandatory corporate social responsibility disclosure and firm innovation: Evidence from a quasi-natural experiment. *Finance Research Letters*, *47*, 102819.

Zhang, X., Zou, M., Liu, W., & Zhang, Y. (2020). Does a firm's supplier concentration affect its cash holding? *Economic Modelling*, *90*, 527-535.

Zhao, X., Lynch Jr, J. G., & Chen, Q. (2010). Reconsidering Baron and Kenny: Myths and truths about mediation analysis. *Journal of Consumer Research*, *37*(2), 197-206.

Zhong, M., & Gao, L. (2017). Does corporate social responsibility disclosure improve firm investment efficiency? Evidence from China. *Review of Accounting and Finance*, *16*(3), 348-365.

Zhong, W., Ma, Z., Tong, T. W., Zhang, Y., & Xie, L. (2021). Customer concentration, executive attention, and firm search behavior. *Academy of Management Journal*, *64*(5), 1625-1647.

How and Why Does a B2B Firm's CSR Disclosure Impact Its Dependence on its Major Customers and Major Suppliers?

E-Companion

Appendix A. SHSE and SZSE's CSR disclosure mandate for public firms

	Shanghai Stock Exchange	Shenzhen Stock Exchange
Issue date	December 30, 2008	December 30, 2008
Title of the notice	"Notice Concerning Listed Companies' Preparations for 2008 Annual Reports"	"Notice of Shenzhen Stock Exchange concerning Listed Companies' Preparations for 2008 Annual Reports"
Disclosure deadline and consequences of failure to disclose	"The listed firms shall disclose the 2008 annual report before April 30, 2009, and the disclosure time shall not be later than the disclosure time of the report of the first quarter of 2009. Firms that cannot disclose the annual report by April 30, 2009, shall submit a written explanation to the Exchange by April 15, 2009, and announce the reasons for the failure to disclose the annual report as scheduled, the solution and the deadline for the delay in disclosure. The stock exchange will suspend trading of the firm's shares and its derivatives from May 1, 2009, and publicly reprimand the Company and the relevant personnel."	"All firms listed before December 31, 2008, should complete the preparation, submission and disclosure of the 2008 annual report by April 30, 2009. Firms that are newly listed between January 1 and April 30, 2009, without disclosing the audited financial and accounting information of the 2008 annual report in the notice for listing shall also disclose the 2008 annual report before April 30, 2009. Firms that cannot disclose the annual report by April 30, 2009, shall submit a written explanation to the Exchange by April 15, 2009, and announce the reasons for the failure to disclose the annual report as scheduled, the solution and the deadline for the delay in disclosure. The stock exchange will suspend trading of the firm's shares and its derivatives with effect from May 1, 2009, and will publicly reprimand the firm or the relevant personnel."
Types of firms that are mandated to disclose CSR report	"The listed firms indexed in the "Shanghai Corporate governance index," issuing overseas stocks and financial firms shall disclose their corporate social responsibility report along with their 2008 annual report. The exchange encourages other qualified listed firms to disclose their social responsibility reports together with the 2008 annual reports. The corporate social responsibility report shall be disclosed on our website as an attachment to the full annual report."	"The listed firms included in the "SHENZHEN 100 Index" shall disclose their corporate social responsibility report in accordance with the requirements of the Social Responsibility Guidelines for Listed Firms. The exchange encourages other qualified listed firms to disclose their social responsibility reports together with the 2008 annual reports."

Appendix B: Summary statistics

Table B1: Distribution of our sample, by industry

Note: This table reports the industry distribution of the sample with the *Dependence on major customers* as the DV (3,228 observations). The industry distribution of the sample with *Dependence on major suppliers* as the DV is similar.

Industry code	Industry name	Freq.	Percent	Cum.
A	Agriculture, forestry, animal husbandry and fisheries	58	1.80	1.80
B	Mining	124	3.84	5.64
C	Manufacturing	2003	62.06	67.69
D	Electricity, heat, gas and water production and supply industry	196	6.07	73.76
E	Construction	90	2.79	76.55
F	Wholesale and retail trade	137	4.24	80.79
G	Transportation, storage and postal services	145	4.49	85.29
H	Accommodation and catering	4	0.12	85.41
I	Information transmission, software and information technology services	98	3.04	88.44
K	Real Estate	193	5.98	94.42
L	Rental and business services	34	1.05	95.48
N	Water conservancy, environment and public facilities management industry	11	0.34	95.82
O	Residential Services, Repair and Other Services	15	0.46	96.28
R	Culture, Sports and Entertainment	2	0.06	96.34
S	Comprehensive	118	3.66	100.00

Table B2: Summary statistics

Variable	N	Mean	SD	P25	Median	P75
Dependence on major customers	3228	0.274	0.230	0.115	0.203	0.361
Treatment	3228	0.539	0.499	0.000	1.000	1.000
Post	3228	0.506	0.500	0.000	1.000	1.000
Supply chain emphasis in the CSR report	3228	0.028	1.050	-0.445	-0.051	0.115
Marketing efficiency	3141	0.803	0.057	0.780	0.814	0.838
Production efficiency	3195	0.686	0.755	0.255	0.453	0.808
Innovation	3228	1.711	1.741	0.000	1.386	2.890
Marketing	3228	0.045	0.036	0.023	0.039	0.059
Pricing power	3228	0.123	0.124	0.047	0.093	0.170
Industry sales concentration	3228	0.509	0.192	0.386	0.482	0.613
SOE	3228	0.732	0.443	0.000	1.000	1.000
Size	3228	22.343	1.272	21.450	22.205	23.108
Age	3228	2.147	0.585	1.946	2.303	2.565
Leverage	3228	0.521	0.190	0.393	0.533	0.652
Profitability	3228	0.049	0.055	0.020	0.042	0.072
Growth	3228	0.232	0.485	0.024	0.160	0.331
Tobin's q	3228	1.772	1.059	1.128	1.402	1.995
Largest shareholder's ownership	3228	0.392	0.161	0.257	0.391	0.515
CSR spend	3228	0.002	0.012	0.000	0.000	0.000

Note: This table reports the summary statistics for the propensity score matched sample with the *Dependence on major customers* as the DV (3,228 observations). The summary statistics for the propensity score matched sample with the *Dependence on major suppliers* as the DV (2, 758 observations) carries a similar distribution. Table 1 in the manuscript lists the measures.

Table B3: Correlation matrix

Note: This table reports the Pearson correlation matrix for the propensity score matched sample with the Dependence on major customers as the DV (3,228 observations). *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dependence on major customers	1									
Treatment	-0.065***	1								
Post	-0.017	0.008	1							
Supply chain emphasis in CSR report	-0.049***	0.138***	-0.017	1						
Marketing efficiency	0.067***	-0.001	-0.040**	-0.002	1					
Production efficiency	0.026	0.267***	0.131***	0.02	-0.019	1				
Innovation	-0.168***	0.174***	0.248***	0.022	0.009	0.064***	1			
Marketing	-0.065***	-0.097***	-0.065***	0.031*	-0.353***	-0.140***	0.113***	1		
Pricing power	0.072***	0.132***	0.037**	0.018	-0.234***	0.457***	-0.181***	-0.228***	1	
Industry sales concentration	0.098***	0.062***	0.046**	-0.013	0.136***	0.055***	0.022	-0.055***	-0.058***	1
SOE	0.090***	0.121***	-0.018	-0.045**	0.093***	0.091***	-0.068***	-0.098***	-0.031*	0.093***
Size	-0.098***	0.374***	0.276***	0.017	0.169***	0.528***	0.276***	-0.361***	0.167***	0.132***
Age	0.012	-0.030*	0.354***	-0.017	-0.026	-0.059***	0.094***	-0.004	-0.011	-0.037**
Leverage	-0.040**	-0.038**	0.039**	-0.070***	0.264***	-0.108***	0.029*	-0.054***	-0.253***	0.098***
Profitability	-0.039**	0.163***	0.002	0.055***	-0.156***	0.313***	0.061***	0.165***	0.548***	-0.059***
Growth	0.029*	0.047***	-0.084***	-0.01	0.118***	0.027	-0.012	0.001	0.142***	0.025
Tobin's q	0.042**	-0.025	0.149***	0.001	-0.270***	0.039**	-0.021	0.321***	0.169***	-0.059***
Largest shareholder's ownership	0.113***	0.162***	-0.029	-0.023	0.090***	0.299***	-0.026	-0.121***	0.157***	0.099***
CSR spend	0.001	0.118***	0.117***	0.024	-0.013	0.025	0.079***	0.046***	-0.004	-0.024

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
SOE	1								
Size	0.209***	1							
Age	0.130***	0.180***	1						
Leverage	0.042**	0.281***	0.096***	1					
Profitability	-0.119***	0.036**	-0.073***	-0.424***	1				
Growth	-0.006	0.071***	-0.062***	0.083***	0.198***	1			
Tobin's q	-0.174***	-0.309***	0.022	-0.239***	0.381***	0.048***	1		

Largest shareholder's ownership	0.309***	0.275***	-0.069***	-0.019	0.083***	0.074***	-0.140***	1	
CSR spend	0.048***	0.061***	0.051***	0.001	0.011	-0.007	-0.016	0.035**	1

Appendix C: Heterogeneity analyses

Table C1: CSR disclosure, supply-chain emphasis in the CSR report, and supply-chain dependence

Note: This table reports the results of whether a firm's *Supply chain emphasis in the CSR report* moderates the effect of its CSR disclosure on its *Dependence on major customers* (Column I) and its *Dependence on major suppliers* (Column II). The *Supply-chain emphasis in the CSR report* is a standardized ratio. The numerator is the sum of the counts of "customer" and its synonyms and the counts of "supplier" and its synonyms, and the denominator is the number of words in the CSR report (which is the CSR report for the postmandate years and MD&A section of the firm's annual report for the premandate years). Higher values of *Supply chain emphasis in the CSR report* indicate that the firm emphasizes its supply chain partners in its CSR report. 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.

	Dependence on major customers	Dependence on major suppliers
	(I)	(II)
Treatment × Post	-0.021*	0.037***
	(-1.94)	(2.72)
Supply chain emphasis in CSR report	0.006	0.008
	(0.94)	(1.61)
Treatment × Post × Supply-chain emphasis in the CSR report	-0.010*	-0.012**
	(-1.75)	(-2.04)
Size	-0.010	-0.034**
	(-0.86)	(-2.50)
Age	0.012	-0.005
	(0.85)	(-0.29)
Leverage	-0.061	-0.058
	(-1.39)	(-1.15)
Profitability	0.068	0.010
	(0.68)	(0.09)
Growth	0.006	-0.005
	(0.89)	(-0.75)
Tobin's q	0.001	0.004
	(0.45)	(0.75)
Largest shareholder's ownership	0.014	-0.096
	(0.22)	(-1.32)
Constant	0.509**	1.189***
	(1.99)	(4.09)
Firm FEs	Yes	Yes
Year FEs	Yes	Yes
N	3228	2758
Adjusted R^2	0.021	0.049

Table C2: Heterogeneity by marketing spending

Note: This table reports whether a firm's *Marketing spending* moderates the effect of a firm's CSR disclosure on its *Dependence on major customers* (Columns I and II) and its *Dependence on major suppliers* (Columns III and IV). *Marketing spending* is the ratio of selling, general, and administrative expenses to total assets. We split the sample based on the median value of *Marketing spending*. 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.

	Dependence on major customers	Dependence on major customers	Dependence on major suppliers	Dependence on major suppliers
	(I)	(II)	(III)	(IV)
	Low marketing	High marketing	Low marketing	High marketing
Treatment × Post	-0.036**	-0.008	0.051***	0.028
	(-2.13)	(-0.60)	(2.88)	(1.55)
Size	0.002	-0.030**	-0.008	-0.031*
	(0.12)	(-2.32)	(-0.46)	(-1.66)
Age	0.014	0.012	-0.013	0.016
	(0.79)	(0.54)	(-0.62)	(0.57)
Leverage	-0.173**	0.037	-0.127*	-0.101
	(-2.49)	(0.78)	(-1.84)	(-1.38)
Profitability	-0.224	0.156	-0.129	0.208
	(-1.19)	(1.48)	(-0.77)	(1.47)
Growth	0.003	0.015	0.002	-0.011
	(0.43)	(1.54)	(0.26)	(-1.25)
Tobin's q	0.009	-0.004	0.006	0.006
	(1.60)	(-0.86)	(1.20)	(0.72)
Largest shareholder's ownership	0.029	-0.063	-0.167*	-0.025
	(0.25)	(-0.87)	(-1.78)	(-0.27)
Constant	0.306	0.901***	0.728*	1.059***
	(0.71)	(3.13)	(1.83)	(2.65)
Firm FEs	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes
N	1614	1614	1308	1450
Adjusted R^2	0.035	0.024	0.055	0.047

Table C3: Heterogeneity by pricing power

Note: This table reports the results of whether *Pricing power* (measured by the Lerner index) moderates the effect of a firm's CSR disclosure on its *Dependence on major customers* (Columns I and II) and *Dependence on major suppliers* (Columns III and IV). *Pricing power*, measured by the Lerner index, is (Operating income − Operating costs − Selling expenses − administrative expenses) ÷ Operating income. Higher values of a firm's *Pricing power* mean that it holds a stronger competitive position within its industry. We split the sample based on the median value of the *Pricing power*. 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.

	Dependence on major customers	Dependence on major customers	Dependence on major suppliers	Dependence on major suppliers
	(1)	(2)	(3)	(4)
	High pricing power	Low pricing power	High pricing power	Low pricing power
Treatment × Post	-0.036**	-0.008	0.048***	0.028
	(-2.07)	(-0.59)	(2.65)	(1.64)
Size	0.002	-0.028**	-0.008	-0.034*
	(0.07)	(-2.16)	(-0.41)	(-1.88)
Age	0.016	0.013	-0.016	0.013
	(0.89)	(0.60)	(-0.75)	(0.49)
Lev	-0.179**	0.032	-0.122*	-0.084
	(-2.55)	(0.68)	(-1.77)	(-1.20)
Profitability	-0.225	0.157	-0.084	0.214
	(-1.19)	(1.51)	(-0.50)	(1.57)
Growth	0.003	0.017	0.003	-0.011
	(0.43)	(1.64)	(0.32)	(-1.21)
Tobin's q	0.009	-0.004	0.005	0.004
	(1.48)	(-0.87)	(0.91)	(0.52)
Largest shareholder's ownership	0.032	-0.039	-0.163	-0.008
	(0.25)	(-0.55)	(-1.62)	(-0.09)
Constant	0.325	0.839***	0.714*	1.120***
	(0.73)	(2.99)	(1.76)	(2.85)
Firm FEs	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes
N	1579	1649	1278	1480
Adjusted R²	0.033	0.020	0.054	0.049

Table C4: Heterogeneity by industry concentration

Note: This table reports whether a firm's *Industry concentration* moderates the effect of its CSR disclosure on its *Dependence on major customers* (Columns I and II) and its *Dependence on major suppliers* (Columns III and IV). *Industry concentration* is the proportion of the operating revenue of the top four companies in the China Securities Regulatory Commission (CSRC) two-digit industry to the operating revenue of all firms. Higher values of *Industry concentration* indicate that the sales are highly concentrated among a few firms. We split the sample based on the median value of the *Industry concentration*. 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.

	Dependence on major customers	Dependence on major customers	Dependence on major suppliers	Dependence on major suppliers
	(1)	(2)	(3)	(4)
	High industry concentration	Low industry concentration	High industry concentration	Low industry concentration
Treatment × Post	-0.024	-0.023*	0.034	0.043**
	(-1.51)	(-1.66)	(1.55)	(2.52)
Size	-0.026	-0.002	-0.035	-0.043***
	(-1.41)	(-0.16)	(-1.42)	(-2.63)
Age	0.006	0.029	-0.005	-0.008
	(0.30)	(1.59)	(-0.18)	(-0.35)
Leverage	0.002	-0.107**	-0.076	-0.103
	(0.04)	(-2.12)	(-0.91)	(-1.54)
Profitability	0.065	-0.007	0.000	-0.031
	(0.55)	(-0.05)	(0.00)	(-0.23)
Growth	0.022*	-0.009	-0.003	-0.000
	(1.88)	(-1.14)	(-0.25)	(-0.04)
Tobin's q	-0.007	0.005	0.002	0.007
	(-1.57)	(1.05)	(0.17)	(1.09)
Largest shareholder's ownership	0.011	-0.052	-0.063	-0.152
	(0.10)	(-0.66)	(-0.53)	(-1.47)
Constant	0.868**	0.343	1.237**	1.400***
	(2.08)	(1.06)	(2.36)	(3.92)
Firm FEs	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes
N	1562	1666	1342	1416
Adjusted R^2	0.022	0.037	0.029	0.069

Table C5: Heterogeneity by whether the firm is government-owned

Note: This table answers: Do the effects of CSR disclosure on *Dependence on major customers* and *Dependence on major suppliers* vary by whether the firm is owned by the Government of China? Government-owned is an indicator variable that equals 1 if the firm's ultimate controller is the Government of China, and 0 otherwise. 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.

	Dependence on major customers	Dependence on major suppliers
	(1)	(2)
Treatment × Post	-0.001	0.042**
	(-0.09)	(2.18)
Government-owned	0.024	-0.026
	(1.12)	(-1.05)
Treatment × Post × Government-owned	-0.026*	-0.007
	(-1.91)	(-0.35)
Size	-0.011	-0.034**
	(-0.97)	(-2.48)
Age	0.011	-0.006
	(0.81)	(-0.33)
Leverage	-0.059	-0.060
	(-1.34)	(-1.17)
Profitability	0.065	-0.000
	(0.64)	(-0.00)
Growth	0.006	-0.005
	(1.00)	(-0.74)
Tobin's q	0.001	0.004
	(0.38)	(0.74)
Largest shareholder's ownership	0.020	-0.092
	(0.30)	(-1.26)
Constant	0.513**	1.199***
	(2.01)	(4.11)
Firm FEs	Yes	Yes
Year FEs	Yes	Yes
N	3228	2758
Adjusted R^2	0.021	0.048