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Diversify or concentrate: The impact of customer concentration on corporate social responsibility

Minghao Zhu
School of Management
Zhejiang University
Hangzhou, Zhejiang, China
and
Faculty of Business
The Hong Kong Polytechnic University
Hung Hom, Kowloon, Hong Kong SAR, China
Email: minghaoz@zju.edu.cn

Andy C. L. Yeung
Faculty of Business
The Hong Kong Polytechnic University
Hung Hom, Kowloon, Hong Kong SAR, China
Email: andy.yeung@polyu.edu.hk

Honggeng Zhou*
School of Management
Zhejiang University
Hangzhou, Zhejiang, China
Email: honggengz@zju.edu.cn
Phone: (86) 0571-88208379

*corresponding author

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Abstract:

Previous studies on the impact of customer concentration on firm-level outcomes mainly focus on financial and operational variables, and the influence of a concentrated customer base remains controversial. As one of the important issues of responsible and sustainable operations management, corporate social responsibility (CSR) has garnered increasing attention of scholars in recent years. However, research on CSR antecedents is far less than the studies of its outcomes, and few studies investigate what determines CSR engagement from buyer-supplier relationship perspective. Using a large sample panel data from Chinese publicly listed firms between 2010 and 2019, we find that a concentrated customer base is negatively associated with suppliers' CSR performance. Our results still hold after a series of robustness checks. Next, the results show that customer concentration is also negatively correlated with CSR's five dimensions, but the negative impact on non-core stakeholders is more significant than that on core stakeholders. Further, the mechanism analysis reveals that profitability and financial constraints are two potential transmission mechanisms in the linkage between customer concentration and CSR performance. Finally, we find that the negative impact is more salient when a supplier with higher transparency. Overall, our study suggests that a close relationship between a supplier and its major customers may impede the supplier's incentives to do good things, and a supplier may weigh benefits and costs to strategically adjust its CSR behaviour as a response to customer risk. These findings have significant implications for suppliers, customers, and regulators.

Keywords: Customer concentration; Corporate social responsibility; Bargaining power; Corporate transparency; China

1. Introduction

The concept of corporate social responsibility (CSR), defined as the responsibility that firms undertake beyond the shareholders' value to meet the expectations of society and a broader set of stakeholders, has become popular since the 1960s (Wang *et al*., 2016). In the past two decades, CSR has garnered an increasing attention both in academia and industry, and more and more firms actively engage in CSR activities and disclose information related to CSR performance. According to a survey conducted by KPMG (2017), 93% of the world's 250 largest companies present their CSR performance in independent reports or as part of their financial reports. Nielsen (2015) released a report which suggests that in 2014, the global sales of consumer goods from brands with sustainable development commitment increased by more than 4%, while those without such a commitment grew less than 1%. In 2015, about 66% of global respondents indicated that they were willing to pay higher prices for sustainable products, compared with 55% in 2014 and 50% in 2013.

Research on CSR can be broadly divided into two groups. One is to explore the potential outcomes of CSR while the other is to investigate its antecedents (i.e., the factors which affect firms' engagement in CSR activities) (Surroca, Tribó & Waddock, 2010). The former, which has been the main focus of CSR research, presents questions as one can "do well by doing good". Firms' engagement in CSR has been seen as an effective way for enhancing performance outcomes. The latter, which has been relatively less studied, concentrates on identifying factors that lead firms to doing good (Julian & Ofori-Dankwa, 2013). Our study is positioned in the research stream dealing with CSR antecedents. The extant literature on CSR antecedents is primarily based on the contexts of developed economies, and explores from three analysis levels, i.e., institutional level, organisational level, and individual level (Aguinis & Glavas, 2012; Julian & Ofori-Dankwa, 2013). However, little attention has been paid to CSR studies in emerging market economies, particularly from an inter-organisational or supply chain level. In

addition, as one of the most important stakeholders of a firm, the role of customers on CSR performance has been severely under-researched. In fact, major customers can influence a supplier's CSR performance in two opposite directions. From traditional operations management (OM) perspective, maintaining close relationships between a supplier and few large customers will help the supplier stabilize its supply chain, promote information sharing between both parties, reduce demand uncertainty, and lower discretionary costs such as administrative and sales expenses, so as to improve the supplier's long-term performance (e.g., Ak & Patatoukas, 2016; Chen *et al*., 2016; Hoejmose, Grosvold & Millington, 2013). Thus, suppliers could have more slack resources to invest in CSR activities. However, a bargaining power perspective suggests that a concentrated customer base will increase the buyer's dominance to the supplier. Major customers may force suppliers to make concessions in product price and quality, trade credit, and delivery date, and even default on payment and transfer costs upstream, which will undoubtedly increase the supplier's risk, damaging the supplier's profitability and worsening its business condition (e.g., Bhattacharyya & Nain, 2011; Casalin *et al*., 2017; Dhaliwal *et al*., 2016). As a resource outflow, in this case, the incentives of suppliers to participate in CSR activities will inevitably decrease. Thus, the direction of the link between customer concentration and suppliers' CSR performance is *ex ante* unclear.

Based on a sample of 17,132 observations from Chinese publicly listed firms between 2010 and 2019, we investigate the impact of customer concentration on suppliers' CSR performance. Our results show that there is a significantly negative relationship between customer concentration and suppliers' CSR performance in the Chinese context, and this relationship still holds after a set of robustness checks (e.g., alternative measures, lagged variables, IV approach, PSM approach, and model setting change). Next, we find that customer concentration is also negatively associated with CSR's five dimensions. However, the degree of negative impact on different dimensions varies. Specifically, the CSR level of core

stakeholders will be less negatively affected, while non-core stakeholders will face a greater negative influence. In addition, the mechanism analysis reveals that profitability and financial constraints are two potential transmission mechanisms in the linkage between customer concentration and CSR performance. Finally, the moderating effect analysis further demonstrate that such a negative impact is more pronounced under high supplier transparency, which implies that a supplier may strategically adjust its CSR behaviour in response to exposure to customer risk. In general, our findings suggest that a very close relationship between the supplier and its major customers may not allow the results to develop toward the expectations of both parties. Major customers are not necessarily able to make suppliers develop towards a sustainable direction, and suppliers will strategically adjust CSR investments to reduce its own CSR pressure. What' more, a supplier is even suspected of diverting the attention of stakeholders via the use of CSR performance. This paper contributes to the literature in a few ways. First, it contributes to the literature that investigates the outcomes of customer concentration. Prior studies on the consequences of customer concentration mainly focus on financial and operational variables and rarely consider sustainability issues. Second, this study expands CSR's antecedents research and provides new empirical evidence for the influence of buyer-supplier relationship on suppliers' CSR performance. Third, our study enriches the literature of signalling role of CSR performance and strategic CSR behaviour. Last but not least, our study echoes the call for conducting more CSR research in emerging market economies.

The remainder of the article is organised as follows. We briefly review related literature and develop our hypothesis in Section 2. Data, sample, measures, and empirical model are presented in Section 3. In Section 4, we report our data analyses results and robustness checks. Additional analysis is shown in Section 5. Discussion is in Section 6. The last section concludes the study and discuss limitations and potential research opportunities.

2. Literature review and hypothesis development

2.1. Customer concentration

Customer concentration denotes the focus of the suppliers' customer base and is one of the most pivotal features of the buyer-supplier relationship (Huang *et al*., 2016). In operations and supply chain management studies, customer concentration can also be expressed as supplier dependence, that is, to what extent a supplier depends upon its major customers in terms of financial resources (Elking *et al*., 2017; Kim & Zhu, 2018; Tangpong, Michalisin & Melcher, 2008). In particular, as the market situation shifts from seller's market to buyer's market, the upstream suppliers in the supply chain are much more dependent on the downstream customers than the latter on the former. As the power of supply chain shifts to the downstream, customer relationship has an increasing impact on suppliers' performance and decision making. The extant studies on customer concentration can be divided into two main groups. One is to explore the benefits brought by customer concentration to suppliers, summarized as the *OM view*; the other is to highlight the "evils" of owning a concentrated customer base, that is, suppliers' reliance on a few major customers may lead to some adverse outcomes, concluded as the *bargaining power view* (Ak & Patatoukas, 2016; Patatoukas, 2012).

On the one hand, operations management and marketing literature point out that the benefits of trading with a few major customers lie in the improvement of efficiency and economies of scale. The reason is that it is more convenient for suppliers to implement supply chain practices (e.g., information sharing, JIT manufacturing, collaborative planning, forecasting, and marketing) with a limited number of major customers, thereby reducing demand uncertainty and improving efficiency (Ak & Patatoukas, 2016; Cowley, 1988). Besides, compared with having a small number of major customers, the cost of meeting the demands of many scattered small customers is higher. Based on this logic, a stream of research on the benefits of concentrated customer base for suppliers has been conducted. For instance, Carr *et*

al. (2008) find that supplier dependence is positively related to supplier participation in buyer supported training and increasing supplier engagement in product development and further improves supplier's operational performance. Similar studies also show that a more concentrated customer base has a positive association with information sharing, joint decisions, flexible arrangements, knowledge sharing, and socially responsible supply chain practices (e.g., Chen *et al*., 2016; Hoejmose, Grosvold & Millington, 2013; Kim & Wemmerlöv, 2015; Ren *et al*., 2010; Terpend & Krause, 2015; Terwiesch *et al*., 2005). In general, the *OM view* focuses more on the supply chain integration effect of customer concentration, that is, the "bright side", which can bring a set of benefits to suppliers.

On the other hand, the *bargaining power view* argues that dealing with a few major customers will hurt the interests of suppliers to a certain extent, that is, the "dark side" of concentrated customer base, which has been verified by a number of articles in economics, finance and accounting fields. This traditional idea can be traced back to early economics literature, which highlights that large customers will have considerable bargaining power and pressure dependent suppliers to make concessions in lowering product prices, extending trade credit, and holding extra inventories in supply chain games (e.g., Galbraith, 1952; Lustgarten, 1975; Porter, 1974; Scherer, 1970). A series of subsequent studies have also suggested that a more concentrated customer base is related to more risks, lower inventory efficiency, higher equity and debt cost, and poorer firm performance (e.g., Bhattacharyya & Nain, 2011; Casalin *et al*., 2017; Dhaliwal *et al*., 2016; Fee & Thomas, 2004; Hui, Liang & Yeung, 2019; Lian, 2017; Ma *et al*., 2020; Murfin & Njoroge, 2015). Besides, the risks and uncertainties brought by concentrated customer base will lead suppliers to strategically adjust their behaviours, such as holding more cash, lowering R&D intensity, and having more incentives for tax avoidance and financial manipulation (e.g., Huang *et al*., 2016; Hui, Klasa & Yeung, 2012; Itzkowitz, 2013; Kim & Zhu, 2018; Raman & Shahrur, 2008). Overall, the *bargaining power view* focuses more

on customer risk effect and is employed to investigate the negative impacts that a concentrated customer base may bring about.

In addition to these two viewpoints, some studies argue that customer concentration has no simple positive or negative impacts on suppliers. They believe that suppliers' benefits and costs will change over time. For example, Eggert, Ulaga & Schultz (2006) summarize that the value created by the key customer relationships will increase over time. However, this positive result needs both parties to make a huge commitment in the early build-up stage. Irvine, Park & Yıldızhan (2016) find that the relationship between customer concentration and profitability is negatively correlated in the early stage of the relationship, but it gradually turns into positive as the relationship matures. In short, the impacts of customer concentration on suppliers in extant research are still unclear, and firm-level outcomes mainly focus on financial and operational variables.

In particular, we believe that the concept of customer concentration is of great significance in the context of the global value chain (GVC). The increasing internationalization, fragmentation, and decentralization of economic activities have made the concept of global value chain attract more and more scholarly attention. In the normal operations of GVC, multinational companies (MNCs) use the governance role of the value chain to control the GVC to which they belong, and seek resources on a global scale to obtain comparative and competitive advantages (Murray, Kotabe & Wildt, 1995). These MNCs' suppliers are either actively or passively embedded in this value chain. On the one hand, leading firms and embedded suppliers carry out cross-border operational collaboration which could help suppliers improve their process and supply capacity; on the other hand, leading firms may also use various complex strategies and tactics to manage cross-border supply chain relationships to obtain economic profits, lower costs, transfer risks, control embedded suppliers, prevent knowledge spillover, protect their core interests and so on.

Suppliers embedded in GVC usually bind a small number of multinational firms to seek development with the intentions of gaining profits and enhancing capabilities. However, the fate of different embedded suppliers varies greatly. Some suppliers have increased their manufacturing capabilities and met the requirements of the leading firm, but they are plundered and squeezed by the latter, with extremely low product margins and the risk of low-end lock-in. In other words, when a supplier embedded in GVC faces a very small customer base, the asymmetry of dependence causes the MNC to have a large bargaining power, forcing its dispersed suppliers to make concessions (especially firms in developing economies). However, some suppliers, despite their low profit margins, have acquired specific capabilities by embedding GVC and successfully applied them to other customer markets. Other suppliers have not only improved their capabilities and expanded the market, but also made substantial profits and successfully "dancing with wolves". These suppliers continue to enhance their control over GVC and even establish themselves as the world's leading "hidden champions" (e.g., BYD, Galanz).

It can be seen that the continuous game between suppliers and customers in the context of GVC is also a process of building suppliers' own competitive advantages. With the improvement of suppliers' competitive advantages, their right of discourse in GVC and right of rent distribution in the network are constantly changing (Gereffi, Humphrey & Sturgeon, 2005). Customer concentration, as a reflection of supplier's dependence on GVC, occupies a place in current and future GVC related research (e.g., GVC governance, GVC mapping, leading firm ownership impact, dynamics of GVC arrangements, chain-level performance management) (Kano, Tsang & Yeung, 2020).

2.2. Corporate social responsibility: Antecedents and outcomes

Considering that our purpose is to investigate the impact of customer concentration on

suppliers' CSR performance, this article is positioned as a firm-level CSR's antecedent study. In this subsection, we will make a review of the studies on the antecedents of CSR in prior literature. There are at least two benefits of doing so. On the one hand, we could identify the potential gap and justify if our study really contributes to the literature. On the other hand, we may have a better understanding of what factors need to be taken into account in our empirical model. After that, we will give a brief introduction to the potential outcomes of CSR to capture recent development in this area, so that we can have a more comprehensive and in-depth landscape of the current status and future trends of CSR research.

Following Aguinis & Glavas (2012) and Wang *et al*. (2016), we discuss what determines CSR from three analysis levels (i.e., institutional, organisational, and individual). First, institutional level of analysis. Scott (1995) divides three pillars of institutions, namely regulative, normative and cultural-cognitive elements. Research on CSR at the institutional level basically involves at least one of the above three elements. Studies regarding laws, regulations, standards and other firms' external stakeholders (e.g., government, suppliers, customers, consumers, community groups, creditor, media, etc.) will be classified into this analysis level. McWilliams & Siegel (2001) point out that different stakeholders have different demands and expectations for firm's devoted resources to CSR. Recent studies also suggest that stakeholders will play different roles and participate in different activities to directly or indirectly affect firms' engagement in CSR. For example, Sen & Bhattacharya (2001) find that customers can influence firms' CSR through the channel of evaluating and purchasing products. Findings from Bansal & Clelland (2004) and El Ghoul *et al*. (2019) suggest that media visibility and freedom have positive associations with CSR performance. Luo, Wang & Zhang (2017) develop a framework and suggest that CSR reporting be seen as an organisational response to institutional complexity which stems from the conflicting demands between central government and local governments in China. In addition, we notice that there are also studies that have

explored the impacts of laws and regulations (e.g., Fineman & Clarke, 1996; Liang & Renneboog, 2017), standards and certification (e.g., Christmann & Taylor, 2006), and culture (e.g., Graafland & Noorderhaven, 2020) on CSR initiatives.

Second, there is an organisational level of analysis. This level of analysis accounts for the largest proportion in CSR-related research. Following Aguinis & Glavas (2012), studies on individuals when they are treated conceptually at the macro level (e.g., boards and top management teams) are also included in our discussion of the organisational level analysis. At this analysis level, previous studies have explored a large number of firm-specific factors that may determine CSR engagement. Intuitively, firms with good financial performance have more capacity to devote into CSR activities (Lys, Naughton & Wang, 2015; Preston & O'bannon, 1997; Waddock & Graves, 1997). Sun & Gunia (2018) find that resource gains can lower CSR concerns, but resource losses may increase CSR concerns even more significantly. However, Julian & Ofori-Dankwa (2013) study this issue in the context of a developing economy (Ghana, a sub-Saharan African country) and find that there exists a negative association between financial resource availability and CSR expenditures. As for corporate governance, both Dyck *et al*. (2019) and Chen, Dong & Lin (2020) emphasize that long-term institutional ownership plays an important role in firms' engagement in CSR. In addition, the relationship between various board characteristics or ownership and CSR have also been examined (e.g., Chang *et al*., 2017; Dam & Scholtens, 2013; Harjoto, Laksmana & Lee, 2015; Johnson & Greening, 1999; Katmon *et al*., 2019; McGuinness, Vieito & Wang, 2017). Other organisational level pre-determined factors of CSR, such as firm location (Husted, Jamali & Saffar, 2016; Lee, 2020), organisational political ideology (Di Giuli & Kostovetsky, 2014; Gupta, Briscoe & Hambrick, 2017), cross-listing (Boubakri *et al*., 2016), organisational slack (Xu *et al*., 2015), and R&D intensity (Padgett & Galan, 2010) have attracted scholars' attention as well.

Finally, scholars also focus on an individual level of analysis. Compared with the above

two analysis levels, there are relatively few studies on individual level factors. Yet, this phenomenon has changed in recent years, and there is an emerging body of research that addresses the role of individuals in CSR activities (Wang *et al*., 2016). Among them, a large proportion of articles use upper echelons perspective to investigate the influences of managers or CEO characteristics on CSR engagement. For example, Chin, Hambrick & Treviño (2013) find that CEOs' political ideologies will impact their firms' CSR practices to a large extent. Other CEO-related characteristics or features, such as hubris (Tang *et al*., 2015), narcissism (Chen, Zhang & Jia, 2019; Petrenko *et al*., 2016; Tang, Mack & Chen, 2018), charisma (Wowak *et al*., 2016), confidence (McCarthy, Oliver & Song, 2017), materialism (Davidson, Dey & Smith, 2019), greed (Sajko, Boone & Buyl, 2021), ability (Yuan *et al*., 2019), tenure (Chen, Zhou & Zhu, 2019), risk-taking incentives (Dunbar, Li & Shi, 2020), married or not (Hegde & Mishra, 2019), and whether having a daughter (Cronqvist & Yu, 2017) have all been examined. At the individual level, in addition to these top managers and directors, employees are also regarded as important drivers of CSR. For instance, a conceptual framework was proposed by Aguilera *et al*. (2007) to outline how employees' psychological needs drive CSR engagement, and Rodell & Lynch (2016) investigate the issue of employee volunteering, and whether such personal efforts will be given credit or stigmatized.

With respect to the outcomes of CSR, this has always been the dominant focus of CSR studies, especially the CSR-financial performance/firm value link. This research stream boils down to answering the question: Can one do well by doing good? This undoubtedly endows CSR with strong "business case".

Similar to the studies about CSR's antecedents, the possible outcomes of CSR can be roughly divided into two dimensions, i.e., organisational level and individual level. At the organisational level, the most frequently discussed topic is the link between CSR and corporate financial performance/firm value. Scholars in different fields have drawn quite different

conclusions on this issue from a variety of perspectives, including positive association (e.g., Bardos, Ertugrul & Gao, 2020; Flammer & Bansal, 2017; Godfrey, Merrill & Hansen, 2009; Wang & Qian, 2011), negative correlation (e.g., Chen, Hung & Wang, 2018; Lu *et al*., 2020), U-shaped relationship (e.g., Barnett & Salomon, 2006; Barnett & Salomon, 2012), inverted U-shaped relationship (e.g., Sun, Yao & Govind, 2019), neutral or irrelevant (e.g., McWilliams & Siegel, 2000), etc. Friede, Busch & Bassen (2015) make a systematic review of more than 2,000 empirical studies on environment, social responsibility, and governance (ESG) and find that about 90% of the studies conclude that there is a non-negative relationship between ESG/CSR and financial performance. What's more, the majority of the articles report positive relationships.

In addition to the CSR-financial performance relationship, at the organisational level, scholars have extended the potential impacts of CSR to many aspects, including, but not limited to, M&A (Arouri, Gomes & Pukthuanthong, 2019; Hawn, 2021), cost of capital (El Ghoul *et al*., 2018), capital allocation efficiency (Bhandari & Javakhadze, 2017), trade credit (Shou *et al*., 2020), tax avoidance (Col & Patel, 2019; Davis *et al*., 2016), financial fraud and firm conduct (Ferres & Marcet, 2021; Li *et al*., 2021). It is worth noting that most studies believe that CSR may bring some insurance-like benefits. That is, when a firm encounters difficult times (e.g., reputation risk, financial crisis, pandemic), CSR can be used as a buffer to alleviate the firm's predicament to a certain extent (Shiu & Yang, 2017; Zhou & Wang, 2020). However, some studies have pointed out that such buffering effect may not be significant (e.g., Bae *et al*., 2021), and it is even possible that when a firm is facing difficulties, CSR may have a backfire/boomerang effect (Bartov, Marra & Momente, 2021; Liu *et al*., 2020). In other words, CSR may exacerbate the current adverse situation. These discussions have deepened our understanding of the potential benefits and problems of CSR for the firm, and have also brought a lot of significantly practical implications to different groups.

At the individual level, the impact of CSR is mainly focused on employee and CEO. For instance, CSR can be used as an employee governance tool to enhance employee engagement and reduce adverse behaviour at the workplace (Flammer & Luo, 2017), and it also plays a role of defending against employees' knowledge leakage (Flammer & Kacperczyk, 2019). However, List & Momeni (2021) find through a natural field experiment that CSR will increase employees' misconduct and shirking. As for CEO, Dunbar, Li & Shi (2020) find that when a firm's CSR status improves, its risk-taking capacity will increase, and a firm may choose to adjust its compensation contracts to increase CEO's risk-taking incentives. These individual-level studies are basically the strategic use of CSR to influence the behaviour of different groups. We look forward to the emergence of more other groups in future CSR outcomes research, such as other top management team members (e.g., chief financial officer, chief sustainability officer), suppliers, customers, consumers, lenders, creditors, etc.

In sum, we briefly review relevant literature in the above two sections, one on the outcomes of customer concentration and the other about CSR's antecedents and outcomes. We find that prior studies on firm-level outcomes of customer concentration mainly focus on financial and operational decisions and the conclusions are inconsistent, and the examination on buy-supplier relationship is still scant particularly in the exploration of CSR antecedents. Therefore, this paper integrates extant literature and investigates the impact of customer concentration on firms' sustainable behaviour, i.e., CSR. We will discuss how a concentrated customer base may affect firms' CSR performance and develop our hypothesis in next section.

2.3. Customer concentration and CSR performance

2.3.1. Why might customer concentration increase CSR performance? The OM view

From the perspective of operations and supply chain management, the continuous purchasing behaviour of major customers can provide suppliers with effective information to

accurately estimate their future sales, thus reducing demand uncertainty, improving inventory management efficiency and receivables recovery rate, as well as reducing discretionary costs such as administrative and sales expenses (Kalwani & Narayandas, 1995). Also, the existence of major customers helps suppliers stabilize their supply chains. Firms with major customers usually have higher revenues and revenue stability, as well as higher IPO outcomes (Saboo, Kumar & Anand, 2017) and better long-term performance (Patatoukas, 2012), providing guarantee for firms to allocate more resources to CSR activities.

In addition, when customer concentration is high, suppliers and customers tend to make relationship-specific investments in order to maintain a close collaborative relationship (Raman & Shahrur, 2008). The "relationship-specific assets" brought about by such kind of investments are only valuable when the supplier maintains normal collaboration with the customer. Once the supplier is unable to survive, the relationship will be over. These invested assets will lose their value, leading to the customer being unable to obtain the corresponding benefits and bearing certain costs (Titman, 1984). Therefore, major customers are motivated to evaluate the investment risks of relationship-specific assets based on public information and available private information. The will actively pay attention to the supplier's operating status, and even intervene in the supplier's daily production and operations activities, so as to promote suppliers to develop towards compliance, sustainability, and responsibility and to maximize the customers' own interests.

Further, to reflect a good production and operations status, a supplier also tends to keep positive images to external stakeholders, and CSR performance can be viewed as a positive signal (Shou *et al*., 2020; Zerbini, 2017). Connelly *et al*. (2011) point out that a certain cost must be paid for the signal to be credible. As a kind of capital outflow, CSR activities require firms to invest in many aspects, such as philanthropic donations, improvement of employee welfare, adoption of green technologies, and procurement of environmentally-friendly facilities

(Mishra & Modi, 2016; Shou *et al*., 2020). Thus, CSR performance can be regarded as a credible signal. Major customers can judge their supplier's current situation and future prospects based on the CSR performance, thereby lowering the information asymmetry degree between the two sides. As a reputation mechanism, CSR performance may also increase customer loyalty and raise the competition threshold of rivals (Godfrey, Merrill & Hansen, 2009).

Hypothesis 1. There is a positive association between customer-base concentration and supplier's CSR performance.

2.3.2. Why might customer concentration decrease CSR performance? The bargaining power view

Although major customers can bring certain benefits to suppliers, a concentrated customer base could also lead to quite a few problems and decrease CSR performance. First, different from conclusions drawn by traditional operations management and marketing literature, economics, finance and accounting studies find that customer concentration is negatively associated with suppliers' financial performance. The logic is that when a supplier's customer base is concentrated, a few major customers tend to form a powerful buyer's market. The great bargaining power of large customers may make suppliers in a passive position in business games. Customers can take this advantage to control suppliers and force them to make concessions in many aspects. Obviously, these factors will lead suppliers to lose profits and face not optimistic operating conditions. Also, a high customer concentration will significantly increase suppliers' equity and debt costs and lower suppliers' financing ability (Dhaliwal *et al*., 2016). However, CSR activities, as a kind of hidden investments, require firms to make a certain amount of current sacrifices in order to obtain possible future benefits. In the short term, CSR is inevitable to form a "crowding out" effect on the resources needed by other projects. But the benefits may not be seen in the short run. Based on the above analysis, when customer

concentration is high, a supplier does not have enough incentives and slack resources to actively engage in CSR activities, resulting in a decrease in its CSR performance.

In addition, extant literature suggests that a concentrated customer base could significantly increase a firm's risk level (e.g., Lee, Jiraporn & Song, 2020; Ma *et al*., 2020). The reason is that higher customer concentration brings more relationship-specific asset investment to the supplier. Once the relationship between a supplier and its major customer discontinues, these assets will lose their value, generate high conversion costs, and pose the risk of lock-in for suppliers. When a supplier is highly dependent on its major customer, once the major customer's purchase plan changes significantly, or the customer encounters financial distress, it will directly interrupt the supplier's sales plan, threaten its solvency, and bring considerable risks to its operations (Lian, 2017). When facing risks, leaders tend to sacrifice uncertain future performance and adopt more conservative strategies to achieve higher current returns (Kim & Zhang, 2016; Kravet, 2014). Previous studies find that CSR activities may not have an obvious positive impact on the current financial performance, and there even exists an opposite effect in the short term (e.g., Barnett & Salomon, 2006; Surroca, Tribó & Waddock, 2010). According to the above analysis, a concentrated customer base can increase a supplier's risk, and the directors will not actively engage in CSR activities due to risk aversion, resulting in a decline in the supplier's CSR performance.

Moreover, higher customer concentration means that customers will have a higher sense of identity with suppliers as their contact time increases (Ring & Van de Ven, 1994). This sense of identity will help stabilize the business relationship between the two parties, and customers will not easily end collaboration with the supplier or increase contacts with supplier's competitors. In this case, the supplier's motivation for customer impression management will also be weakened accordingly, and the pressure on the firm to proactively participate in CSR activities will be reduced as well. In particular, in the Chinese context, the presence of major

customers is a powerful signal in itself. Investors and other external stakeholders can indirectly infer certain properties of a firm from the corporate image and business activities of its major customers. Therefore, firms tend to reduce their CSR pressure through "free riding", which in turn leads to lower CSR performance.

Finally, a dispersed customer base means that a supplier will face a large number of customers. Compared with private channels, CSR performance is a low-cost way of communication in this case. Its audience can cover many scattered and small customers, making CSR an effective way of transmitting signals. However, when the customer concentration is high, the transaction objects of a supplier are mainly a few major customers, that is, a supplier usually just needs to maintain close business and personal relationships with these large customers. In this case, suppliers and customers tend to communicate via private channels because both parties are familiar with each other. Thus, the role of CSR performance will be weakened. Prior studies also suggest that private information access promoted by close relationships can lower stakeholders' demand for public information (e.g., Ball, Kothari & Robin, 2000; Biddle & Hilary, 2006). Therefore, suppliers have insufficient incentives to engage in CSR activities, which leads to the decline of CSR performance.

Hypothesis 2. There is a negative association between customer-base concentration and supplier's CSR performance.

3. Methodology

3.1. Data and Sample

The data used in this article are collected from two main sources. Specifically, we obtain firm-level financial and governance data from the China Stock Market & Accounting Research (CSMAR) database and CSR score data from Hexun database. The CSMAR is a comprehensive research-oriented database focusing on China's finance and economy. It is one of the largest

databases on Chinese listed firms and a major source of credible information on the listed firms' backgrounds and financial statements in China. The database has been widely used in prior research related to Chinese publicly listed firms (e.g., Chen, Hung & Wang, 2018; Lam *et al*., 2016; Qian *et al*., 2017; Ye, Yeung & Huo, 2020). Developed by an independent rating agency in China, Hexun database has been releasing the annual CSR data of Chinese listed firms since 2010. The Hexun evaluation system is divided into five first-level dimensions (i.e., shareholder, employee, supplier-customer-consumer rights, environmental protection, and philanthropic donations), and each dimension sets up several secondary and tertiary level metrics (including a total of 13 secondary-level metrics and 37 tertiary-level metrics) to give a comprehensive assessment of Chinese listed firms' annual CSR performance. The CSR performance from Hexun database has been deployed in recent Chinses CSR studies (e.g., Gong *et al*., 2020; Shou *et al*., 2020; Tang, Fu & Yang, 2019; Wei, Nan & Wei, 2020).

Our initial sample includes all Chinese A-share listed firms from 2010 to 2019 as Hexun database releases annual CSR performance data since 2010. Following prior literature (Chen, Sun & Wu, 2010; Chen, Hung & Wang, 2018), we exclude firms in financial industries and B-share (foreign share) firms, as their regulatory policies and market trading mechanisms are obviously different from those of A-share firms. After excluding firm-years that are missing necessary data for the variables used in our regressions, our final sample includes 17,132 firm-year observations between 2010 and 2019. Panels A, B, and C of Table 1 present our sample distribution by industry, year, and location, respectively. We see that our sample is concentrated in manufacturing sector, which represents 67.86% of the full sample. In addition, observations from coastal areas and developed provinces (e.g., Beijing, Guangdong, Jiangsu, Shandong, Shanghai, and Zhejiang) account for a considerable proportion.

<< Insert Table 1 about here >>

3.2. Measures

3.2.1. Measure of CSR performance

Following prior literature, we use the CSR scores annually released by Hexun database as a measurement for firms' CSR performance (http://stockdata.stock.hexun.com/zrbg/). Since 2010, Hexun has been using the evaluation system based on firms' CSR report and annual report to release annual CSR scores of Chinese listed companies. Specifically, Hexun gives evaluation of a firm's annual CSR performance based on five dimensions: shareholder, employee, supplier-customer-consumer rights, environmental protection and philanthropic donation. These five first-level dimensions, consisting of 13 secondary-level indicators and 37 tertiary-level indicators, form the basis for Hexun CSR performance evaluation system. This method has similarities with studies which use the Kinder, Lydenberg, Domini Research & Analytics, Inc. (KLD) score as a proxy for a firm's CSR performance in the United States (e.g., Awaysheh *et al*., 2020; Davidson, Dey & Smith, 2019; Flammer & Kacperczyk, 2019).

3.2.2. Measure of customer concentration

The way of measuring customer concentration is not consistent in prior literature, and most of the studies use calculations on the basis of the proportion of a firm's sales to its major customers. In line with previous literature (e.g., Ak & Patatoukas, 2016; Dhaliwal *et al*., 2016; Kim & Zhu, 2018; Zhong *et al*., 2020), we use three measures to capture a supplier's dependence on its major customers. The first measure of customer concentration, *CC_HHI*, is a Herfindahl-Hirschman index of sales to the supplier's five largest customers, computed as follows:

$$CC\_HHI_{it} = \sum_{j=1}^{5} \left(\frac{Sales_{ijt}}{Sales_{it}}\right)^2$$

where $Sales_{ijt}$ represents supplier (focal firm) i's sales to major customer j in year t and $Sales_{it}$ denotes supplier i's total sales in year t. This variable is between zero and one, and the closer it is to one, the higher the customer concentration is. Our second measure, *CC_Top1*, represents the percentage of sales made to a supplier's largest customer. The third measure, *CC_STD*, captures the standard deviation of sales proportion of a supplier's top five customers. In robustness tests section, other three alternative measures are employed to reflect customer concentration. For example, *CC_Total5*, the sum of the percentage of sales to the top five customers; *CC_Top1_10%*, a dummy variable coded one if the percentage of sales to the biggest customer is more than ten percent and zero otherwise; and *CC_GAP*, the difference between the sales proportion of the largest customer and the second largest customer. The findings still hold when using these alternative measures.

3.2.3. Control variables

Consistent with prior studies (e.g., Boubakri *et al*., 2016; Chen, Dong & Lin, 2020; Hegde & Mishra, 2019; Husted, Jamali & Saffar, 2016; Tang, Mack & Chen, 2018), a set of variables are included in our analysis to control for various factors that are suggested to influence firms' CSR performance. In particular, we include firm size (*Size*), the natural logarithm of total assets, firm age (*Age*), the natural logarithm of the number of years since a firm was established plus one, debt to asset (*Leverage*), total debts divided by total assets, return on assets (*ROA*), net income divided by total assets; cash (*Cash Holding*), sum of cash and cash equivalents divided by total assets, top five major shareholder ownership (*CR_5*), the shareholding ratio of the top five major shareholder, financial slack (*Financial Slack*), current assets divided by current liabilities, and capital intensity (*Capital Intensity*), total assets divided by sales. Finally, year, industry, and province dummies are included in the model to control for any unobserved trends, industrial characteristics, and geographic variations.

3.3. Model specification

We use annual pooled data and perform the following multivariate OLS regression model to empirically examine the impact of concentrated customer base on suppliers' CSR performance:

$$CSR_{it} = \beta_0 + \beta_1 CC_{it} + \beta_2 Size_{it} + \beta_3 Age_{it} + \beta_4 Leverage_{it} + \beta_5 ROA_{it} + \beta_6 Cash\ \ Holding_{it} + \beta_7 CR\_5_{it} + \beta_8 Financial\ \ Slack_{it} + \beta_9 Capital\ \ Intensity_{it} + YearFEs + IndustryFEs + ProvinceFEs + \varepsilon_{it} \quad (1)$$

where all of the variables have been defined in Section 3.2. Before running data, we winsorize all continuous variables at the 1% and 99% levels to mitigate the potential impact of outliers.

4. Empirical results

4.1. Descriptive statistics and correlation

Table 2 provides descriptive statistics of all the variables. We see that in our sample, the average CSR score is just 24.1710, and the maximum score is 74.7500. Compared with the full CSR score of 100, the data shows that the current CSR performance of Chinese listed firms is still at a low level. The standard deviation of CSR score is 16.6124, indicating that CSR performance varies greatly in our sample. Turning to the independent variables, we see that the mean of *CC_HHI* is 0.0531, which indicates that for Chinese listed firms, their customer base is relatively concentrated. The means of *CC_Top1* and *CC_STD* are 0.1390 and 0.0427, respectively. The above results indicate that the CSR performance and customer concentration characteristics of each sample are quite distinct, which is suitable for the follow-up research of this paper.

<< Insert Table 2 about here >>

Table 3 is the correlation matrix of all the variables. We find that there are significantly negative correlations between the CSR performance and all three customer concentration measures (*CC_HHI*, *CC_Top1*, and *CC_STD*), which gives us a prediction that a concentrated customer base may have negative impact on suppliers' CSR performance. Among the control variables, *Size*, *ROA*, *Cash Holding*, *CR_5*, and *Financial Slack* are positively correlated with CSR performance, while *Age*, *Leverage* and *Capital Intensity* have negative correlations with CSR performance. The above results indicate that firms with good financial performance, reasonable governance structure and abundant slack resources are more likely to engage in CSR activities. The maximum variance inflation factor (VIF) score is 2.25, which is well below the cut-off of 10. This shows that multicollinearity is not a concern in our study.

<< Insert Table 3 about here >>

4.2. Customer concentration and CSR performance

We run a multivariate OLS regression model to test the relationship between customer concentration and CSR performance. Regression results can be found in Table 4. The dependent variables for the three models are all raw CSR scores, and the independent variables in model 1 to 3 are *CC_HHI*, *CC_Top1* and *CC_STD*, respectively, and the remaining control variables are all the same. The regression results show that the coefficients of the three measures of customer concentration are all negative at the 1% level (-4.0268, -3.3490, and -7.9778, respectively), that is, there is a significant negative association between customer concentration and suppliers' CSR performance. The results show that our hypothesis 1 is not valid, and the empirical results support hypothesis 2. Therefore, the bargaining power view has greater

explanatory power in the linkage between customer concentration and CSR performance in Chinese context.

In terms of control variables, it can be seen that *Size*, *Age*, *ROA*, *Cash Holding*, *CR_5*, and *Financial Slack* have positive impacts on firms' CSR performance, while the association between CSR performance and *Leverage* and *Capital Intensity* are negative. These findings are basically consistent with extant literature. In general, our baseline regression results reveal that there is a significantly negative relationship between customer concentration and suppliers' CSR performance, and that firms with good financial performance, reasonable governance structure and sufficient slack resources may have better CSR performance.

<< Insert Table 4 about here >>

4.3. Robustness tests and endogeneity issues

4.3.1. Alternative measures

We use some alternative measures to replace our independent and dependent variables to make sure that our results are robust. For independent variables, we follow prior literature (e.g., Ak & Patatoukas, 2016; Dhaliwal *et al*., 2016; Kim & Zhu, 2018; Zhong *et al*., 2020) to construct three alternative measures of concentrated customer base, i.e., *CC_Total5*, *CC_Top1_10%*, and *CC_GAP*, which have been defined in Section 3.2.2. Consistent with our main measures, the greater the value of these three alternative measures, the more concentrated the supplier's customer base.

Table 5 reports the analysis results of the association between alternative customer concentration measures and CSR performance. We find that the coefficients of the three alternative measures are all significantly negative at the 1% level as well (-2.3247, -0.7460, and -3.5106, respectively), and the signs of each control variables are consistent with baseline

results, indicating the robustness of our findings.

<< Insert Table 5 about here >>

In addition, we follow Dyck *et al*. (2019) to take natural logarithm of raw CSR scores as alternative dependent variable for robustness test. The advantage of taking the natural logarithm is that it can obtain better distribution properties and reduce the influence of outliers. Table 6 presents the regression results. In models 1 to 6, the dependent variables are the natural logarithm of raw CSR scores, and the independent variables are six different measures of the customer concentration aforementioned. We see that the coefficients of all six independent variables are significantly negative, and compared to raw CSR scores, the adjusted *R*-squares of the regression results after the natural logarithm is taken are greater (from about 0.389 to 0.447).

<< Insert Table 6 about here >>

4.3.2. Endogeneity issues: Reverse causality

"Endogeneity is defined as a problem of self-selection, which leads firms to choose decisions based on their own attributes, thus leading to incorrect conclusions" (Kim & Zhu, 2018; Toh & Polidoro, 2013). In general, endogeneity broadly refers to situations where an explanatory variable is correlated with the error term. Endogeneity can stem from reverse causality, omitted variables, and sample selection bias, etc. These situations make it impossible to obtain unbiased estimation of OLS regression results, thus leading to unreliable conclusions.

First, in consistent with prior literature (e.g., Hegde & Mishra, 2019; Shou *et al*., 2020), we use one-year lag of each customer concentration measure and control variables instead of

their present values to rerun the regression, which can help us mitigate potential endogeneity problem caused by reverse causality. Table 7 reports the results. It can be seen that the coefficient of *L.CC_HHI* is significantly negative at the 5% level (-2.9505), and the coefficients of other two customer concentration measures are significantly negative at the 1% level (-3.0965 and -7.0737, respectively). The results suggest that customer concentration is indeed the possible cause of the decline in CSR performance.

<< Insert Table 7 about here >>

4.3.3. Endogeneity issues: Omitted variables

To further alleviate the endogeneity issue caused by omitted variables (e.g., unobservable CEO/firm characteristics), we employ instrumental variable (IV) approach to overcome this concern. Specifically, we perform a two-stage least squares (2SLS) regression analysis. The main idea of the analysis is to find instrumental variables which correlate with endogenous independent variables but have no correlation with the error term (Wooldridge, 2002). Similar to prior studies (e.g., Dhaliwal *et al*., 2016; Hanlon, Rajgopal & Shevlin, 2003; Jin, 2002; Shi, 2003), We calculate one-year lagged industry means of three customer concentration measures as the instrumental variables based on 2012 CSRC industry classification and exclude the supplier's customer concentration from this computation. Table 8 Panel A reports first-stage results, and Panel B reports second-stage results. The predicted values from the first-stage are used in the second-stage regressions. The dependent variables in models 1-3 of Panel A are *CC_HHI*, *CC_Top1*, and *CC_STD*, respectively. We see that the IVs (*L.CC_IndHHI*, *L.CC_IndTop1*, and *L.CC_IndSTD*) we select are significantly positively associated with customer concentration measures at 1% level, and the Anderson canon. corr. LM statistic are all significant at 1% level as well, indicating that our IVs meet the criteria of correlation.

Turning to Panel B, the dependent variable in models 1-3 of Panel B is CSR performance. Results show that the predicted values (*CC_HHIhat*, *CC_Top1hat*, and *CC_STDhat*) all have significantly negative associations with CSR performance at 10% level, which further suggests that the negative impact of customer concentration on CSR performance still holds after coping with potential omitted variables issues. The Cragg-Donald Wald F statistic significantly exceeds the threshold of the Stock-Yogo weak ID test critical values, indicating that our IVs do not suffer from weak instrumental variables problem.

<< Insert Table 8 about here >>

4.3.4. Endogeneity issues: Sample selection bias

To mitigate the endogenous problem caused by sample selection bias, for instance, firms with concentrated customer base are essentially different from those with disperse customer base, we use propensity score matching (PSM) approach to alleviate this issue. We divide our samples into a treatment group (with major customers) and a control group (without major customers) based on whether the firm has a major customer in that year (i.e., the presence of a customer whose sales account for more than 10% of the supplier's total sales in that year). Specifically, we first use the indicator variables to run Logit regression to calculate the propensity scores for the full sample. Then, we use the nearest neighbour, no-replacement, one-to-one matching standard to select one observation from the control group for each observation from the treatment group based on their propensity scores. The first stage Logit regression results are presented in Table 9 Panel A. We see that there is a significantly negative correlation between firm size and age and the presence of major customers, while the coefficients of *Leverage*, *CR_5*, *Financial Slack* and *Capital Intensity* are significantly positive. It shows that firms with smaller size, shorter establishment time, higher leverage, more concentrated

shareholder ownership and more financial slack are more likely to have a concentrated customer base. The covariate balance checks of the matched sample can be found in Table 9 Panel B. We find that the means of variables are statistically the same across the two groups, indicating that after matching, there is no significant differences between our treatment group and control group. After that, we rerun our model 1 with the matched samples. Regression results are reported in Table 9 Panel C. Consistent with earlier findings, we see that the coefficients of all three measures of customer concentration remain significantly negative (-3.9709, -2.9320, and -6.9954, respectively), suggesting that our findings still hold after controlling for sample selection bias.

<< Insert Table 9 about here >>

4.3.5. Non-linearity test

To verify the possible non-linear relationship between customer concentration and CSR performance, we follow Bellamy, Ghosh & Hora (2014) to provide an alternative model with the squared term of customer concentration as a control variable in the regression models. Results can be found in Table 10. The results show that the squared terms of all the three customer concentration measures are not significant and their inclusion leads to similar results that are in consistent with the findings in our model without the terms. Thus, there is no non-linear relationship between customer concentration and CSR performance, and our original model setting is reasonable.

<< Insert Table 10 about here >>

Collectively, the above empirical analysis shows that customer concentration is negatively

associated with suppliers' CSR performance, and after a series of robustness tests, our findings are still valid.

5. Additional analysis

5.1. Customer concentration and CSR's five dimensions

As we have described in section 3.2.1, the CSR score provided by Hexun database is the sum of the scores of five first-level indicators (e.g., shareholder, employee, supplier-customer-consumer rights, environmental protection, and philanthropic donation). Since customer concentration has a significantly negative impact on the overall CSR score, a natural idea is, what will be the impact of customer concentration on the five dimensions that constitute the total CSR score? Through this analysis, we can have a clearer understanding of the various effects of customer concentration on different CSR's dimensions, as well as the firm's strategic CSR adjustments behaviour.

Regression results can be found in Table 11 Panel A, B, and C. We see that, except that the coefficient of employee dimension in Panel A is not significant, all other coefficients are significantly negative to varying levels, indicating that customer concentration has certain negative impacts on all five dimensions. In particular, we find that the three panels all show that customer concentration has the largest influence on philanthropic donation (community) dimension, while the influence on employee dimension is the least. This finding suggests that, when faced with the negative impact of concentrated customer base, firms may decrease more of the CSR engagements of non-core and less important stakeholders (e.g., community involvement), and try to keep CSR levels of core stakeholders (e.g., employee). To some extent, this also reflects that firms will strategically adjust their CSR behaviour when facing adverse conditions.

<< Insert Table 11 about here >>

5.2. Potential mechanism tests

In this subsection, we discuss the potential transmission mechanisms in the relation between customer concentration and CSR performance. Through mechanism analysis, we could have a deeper understanding of the way in which customer concentration and CSR performance is operationalized. According to the discussion in section 2.3.2, we consider that a concentrated customer base may damage the profitability of the supplier, that is, a high customer concentration will lead to poor financial performance of the supplier, resulting in reduced engagement in CSR activities. Ultimately, this leads to a decline in CSR performance. To verify this possible mechanism, we further adopt a mediating variable model to verify our hypothesis. We build the following models on the basis of Model 1:

$$Profitability_{it} = \gamma_0 + \gamma_1 CC_{it} + \gamma_2 Controls_{it} + YearFEs + IndustryFEs + ProvinceFEs + \varepsilon_{it} \quad (2)$$

$$CSR_{it} = \lambda_0 + \lambda_1 CC_{it} + \lambda_2 Profitability_{it} + \lambda_3 Controls_{it} + YearFEs + IndustryFEs + ProvinceFEs + \varepsilon_{it} \quad (3)$$

We use ROA to measure profitability, which is widely used in prior literature (e.g., Wang & Qian, 2011). In Model 2, we expect to see that γ_1 is significantly negative. If γ_1 is not significant, even if firms' profitability significantly affects CSR performance, it cannot be explained that it is an intermediate way for customer concentration to influence CSR performance. In Model 3, the significance of λ_2 represents whether the mediating effect of firms' profitability is significant or not. λ_1 represents the direct effect of customer concentration on CSR performance. In Models 2 and 3, $\gamma_1 \cdot \lambda_2$ represents the indirect effect. If the mechanism of profitability is established, then the coefficient of γ_1 should be

significantly negative, and the coefficient of λ_2 should be significantly positive.

Table 12 Panel A and Panel B respectively report the regression results of Models 2 and 3. In Panel A, we see that the coefficients of the three customer concentration measures are all significantly negative (-0.8437, -1.1085, and -2.4689, respectively). It shows that customer concentration has a significant negative impact on the profitability of a supplier, which is also consistent with the conclusions of previous studies (e.g., Hui, Liang & Yeung, 2019). The results of Panel B show that firms' profitability does play a mediating role. The mechanism is as follows: the higher the customer concentration, the worse the firms' profitability and thus the worse the CSR performance.

<< Insert Table 12 about here >>

In addition, another possible channel is financial constraints. How financial constraints affect firm behaviour is no doubt one of the core questions in corporate finance and empirical operations management (Farre-Mensa & Ljungqvist, 2016). Especially for Chinese firms, financial constraints are a major factor restricting their development. Financial constraints refer to the situation that due to the existence of certain factors, the external financing cost of firms is too high and therefore firms' investments cannot reach the optimal level (Fazzari, Hubbard & Petersen, 1988). We argue that the presence of major customers has a positive impact on the suppliers' financial constraints. According to previous analysis, the loss of major customers will seriously affect the sales performance of the supplier, making the supplier's future operations and income under high risks. In addition, if the major customers fall into financial distress, it will be difficult for the supplier to recover a large number of receivables, leading to the firm facing a greater risk of cash flow. Investors and creditors in the capital market will demand higher risk premium due to the risk signal transmitted by concentrated customer base. They will

also formulate more stringent investment and loan conditions, making firms under higher financial constraints. Financial constraints often have limitations to operational decisions (Wuttke, Rosenzweig & Heese, 2019). In this circumstance, a supplier is unable to reach an optimal level of investment, thereby cutting down a portion of investments which is not significant for short-term profit (e.g., CSR investments) to save cash flow and ensure that there is relatively sufficient money in other areas. Therefore, we posit that financial constraint is another potential transmission mechanism. Similar to Models 2 and 3, we construct Models 4 and 5 to test if the mechanism of financial constraints is established:

$$FCs = \delta_0 + \delta_1 CC_{it} + \delta_2 Controls_{it} + YearFEs + IndustryFEs + ProvinceFEs + \varepsilon_{it} \quad (4)$$

$$CSR_{it} = \eta_0 + \eta_1 CC_{it} + \eta_2 FCs_{it} + \eta_3 Controls_{it} + YearFEs + IndustryFEs + ProvinceFEs + \varepsilon_{it} \quad (5)$$

Firm size is the most widely used measure of financial constraints in the literature (e.g., Almeida, Campello & Weisbach, 2004; Cleary, 1999). Possible reasons are as follows: on the one hand, small-scale firms usually have a short listing time, so the outside world can just obtain very limited information about the firm's operations and credibility, which exacerbates the information asymmetry between the firm and the capital market. On the other hand, for Chinese firms, China's special institutional background leads to banks with significant discrimination on small-scale firms in lending policies, which is manifested in giving priority to the loan needs of large state-owned firms and listed firms in key industries. Since firm size reflects the degree of financial constraints, that is, large firms will face lower financial constraints, we expect that in Model 4, the sign of δ_1 is significantly negative, while in Model 5, η_1 is significantly negative and η_2 is significantly positive. Table 13 Panel A and B reports the regression results of Model 4 and 5, respectively. In Panel A, we can see that three measures of customer concentration are all significantly negatively associated with firm size, indicating that customer

concentration is positively related with firms' financial constraints. The results from Panel B shows that financial constraints are significantly negatively associated with CSR performance. Together, results of Table 13 suggest that financial constraint is a transmission mechanism between customer concentration and CSR performance.

<< Insert Table 13 about here >>

5.3. Moderating effect analysis

The investigation of the boundary conditions can deepen our understanding of the main effect mechanisms and help promote research on both customer concentration and CSR performance (Fu, Tang & Chen, 2020). In particular, in this article, we hope to explore whether the negative impact of customer concentration on CSR performance will be affected by the contextual factor of corporate transparency. The reason we are interested in this is that since CSR performance can be regarded as a signal that a firm is operating well to reduce information asymmetry, will the signalling effect of CSR performance be strengthened or mitigated when firms have other mechanisms to lower information asymmetry? To put it in another way, for instrumental motivations, will firms strategically weigh the costs and benefits of signals to maximize their value?

Corporate transparency is defined as "the widespread availability of firm-specific information concerning publicly listed firms in the economy to those outside the firm" (Bushman, Piotroski & Smith, 2004). The higher the transparency of the firm, the richer and more accurate the information it injects into the market, and the stronger the information liquidity. A more transparent firm can help investors and other external stakeholders have a more timely and comprehensive understanding of the related information of the firm. When a supplier is more transparent, major customers will be able to grasp the information of the

supplier more accurately and make corresponding decisions, thus reducing their dependence on the signalling role of CSR performance.

In addition, the costs of improving corporate transparency (e.g., reducing the level of earnings management) are usually lower than the costs of engaging in CSR activities which require more resource sacrifice and are harder to see results in the short term. This indicates that in the case of high corporate transparency, CSR may become a kind of "repeated investment", and the willingness of firms to proactively participate in CSR activities will decline. A rational firm will weigh the costs and benefits of signals and choose a low-cost, high-efficiency signal to tell the outside world its current conditions and future prospects. From another perspective, when a firm's information is opaque, the amount of information released by CSR performance will be greater, and customers will have more demands on CSR performance as well. Thus, suppliers may cater to the needs of major customers to engage more actively in CSR activities. In addition, a firm may strategically resort to CSR practices due to motivations such as diverting the attention of stakeholders to disguise losses when its transparency is at a low level (Martínez-Ferrero, Banerjee & García-Sánchez, 2016; Prior, Surroca & Tribó, 2008). Therefore, we argue that the negative impact of customer-base concentration on CSR performance is strengthened (weakened) for suppliers with high (low) corporate transparency.

To verify the above hypothesis, we add the interaction term between corporate transparency and customer concentration in Model (1), and construct the following model:

$$\begin{aligned} CSR_{it} = {} & \beta_0 + \beta_1 CC_{it} + \beta_2 Earnings\ \ Management \times CC_{it} + \beta_3 Institutional\ \ Ownership \times CC_{it} \\ & + \beta_4 Earnings\ \ Management_{it} + \beta_5 Institutional\ \ Ownership_{it} + \beta_6 Size_{it} \\ & + \beta_7 Age_{it} + \beta_8 Leverage_{it} + \beta_9 ROA_{it} + \beta_{10} Cash\ \ Holding_{it} + \beta_{11} CR\_5_{it} \\ & + \beta_{12} Financial\ \ Slack_{it} + \beta_{13} Capital\ \ Intensity_{it} + YearFEs + IndustryFEs \\ & + ProvinceFEs + \varepsilon_{it} \end{aligned} \tag{6}$$

Following prior literature (e.g., Boone & White, 2015; Durnev, Errunza & Molchanov, 2009; Firth, Wang & Wong, 2015; Hutton, Marcus & Tehranian, 2009), we use two measures to capture corporate transparency, i.e., earnings management and institutional ownership which presented in Model 6. First, we employ the modified Jones model (Dechow, Sloan & Sweeney, 1995) to calculate a firm's earnings management. Specifically, we estimate the following cross-sectional regression equation using firms in each industry for each fiscal year:

$$\frac{TA_{it}}{Assets_{it-1}} = \alpha_1 \frac{1}{Assets_{it-1}} + \alpha_2 \frac{\Delta Sales_{it}}{Assets_{it-1}} + \alpha_3 \frac{PPE_{it}}{Assets_{it-1}} + \varepsilon_{it} \qquad (7)$$

where TA_{it} denotes total accruals for firm *i* during year *t*, $Assets_{it-1}$ denotes total assets for firm *i* at the end of year *t*-1, $\Delta Sales_{it}$ denotes change in sales for firm *i* in year *t*, and PPE_{it} denotes property, plant, and equipment for firm *i* at the end of year *t*. Discretionary annual accruals ($DACC_{it}$) as a fraction of lagged assets for firm *i* during year *t* are calculated using the parameter estimates from Model 7:

$$DACC_{it} = \frac{TA_{it}}{Assets_{it-1}} - \left(\hat{\alpha}_1 \frac{1}{Assets_{it-1}} + \hat{\alpha}_2 \frac{\Delta Sales_{it} - \Delta Receivables_{it}}{Assets_{it-1}} + \hat{\alpha}_3 \frac{PPE_{it}}{Assets_{it-1}}\right) \qquad (8)$$

where hats over the coefficients denote estimated values from regression Model 7. $\Delta Receivables_{it}$ is the change in accounts receivable from the prior year. The inclusion of $\Delta Receivables_{it}$ in Model 8 is the standard modification of the Jones (1991) model. The absolute value of annual discretionary accruals ($AbsDACC_{it}$) is used to represent opacity in financial reports (Peng, Wang & Chan, 2020). The larger absolute value of annual discretionary accruals, the higher the opacity, and the less transparent a firm is. Our second measure, institutional ownership, represents the proportion of the total number of shares held by institutional investors at the end of the year. The higher the institutional ownership, the higher the corporate transparency (Boone & White, 2015).

Table 14 reports the regression results. Columns 1-3 show the interaction terms of earnings management and three customer concentration measures, respectively. We find that the coefficients of the three interactions are all significantly positive. Note that earnings

management represents the opacity of firm information and the main effect is negative, indicating that the negative impact of customer concentration on suppliers' CSR performance is weakened when suppliers are under low transparency. Similarly, columns 4-6 present the interaction terms of institutional ownership and three customer concentration measures, respectively. We find that the coefficients of the three interactions are all significantly negative, which verifies our prediction above as well. Columns 7-9 present the full models which simultaneously contain the two interaction terms, and we find that the coefficient estimates are still consistent with the above findings.

<< Insert Table 14 about here >>

6. Discussion

As one of the firm's important non-financial stakeholders, customer has a profound impact on the firm in many ways. The buyer-supplier relationship, a commercial contractual relationship based on purchase and sale transactions established between a firm and its customers in daily transaction activities, has an important influence on the firm's business strategy, financial performance, corporate value, risk taking and many other aspects. As one of the dimensions of firm's sustainable operations, CSR has been paid more and more attention by the industry and academia. Surprisingly, few studies have explored firms' CSR behaviour from the perspective of the buyer-supplier relationship. In view of this, this article investigates the linkage between customer concentration and firms' CSR performance to enhance the understanding of potential outcomes of customer concentration and to provide empirical evidence on the antecedent of CSR.

We find that in the Chinese context, there is a significantly negative relationship between customer concentration and firms' CSR performance, and this relationship still holds after a set

of robustness tests (e.g., alternative measures, lagged variables, IV approach, PSM approach, change model settings). From the traditional OM view, the existence of major customers can bring a series of benefits to firms. However, our results indicate that in addition to these benefits, major customers in the Chinese market have strong bargaining power. Due to the asymmetry of power, major customers will force suppliers to make concessions, which will adversely affect the business activities of the firm and thus reduce the suppliers' CSR performance. Our results are also consistent with relevant research findings in the fields of economics, finance, accounting, etc., which emphasizes that the higher bargaining power of customers brought about by concentrated customer base will do harm to the suppliers.

The possible reason lies in that, as a developing country, China is still in the early stage of market economy, and the system in various aspects (e.g., legal protection, business environment, policy stability) is not perfect, and the construction of commercial credit system also needs to be strengthened. As a result, opportunistic behaviour is very common in current business activities (Huo *et al*., 2019; Wang *et al*., 2016). In such an environment, major customers in the Chinese market may not play the role of monitor or certifier like major customers in developed countries (e.g., the United States) (Itzkowitz, 2015). Instead, they squeeze and plunder more often, making suppliers face higher risks and reduced profits. Firms invest in CSR and hope to obtain insurance-like benefits, which also indicates that CSR investments usually fail to see returns in the short run. In addition, engaging in CSR activities brings real costs and leads to the outflow of economic benefits. When firms face high customer risks, in order to reduce risks and stabilize returns, CSR investments, which cannot see short-term benefits, are often the first to be cut down, thus showing a decline in CSR performance.

In addition, our results also show that there is a significantly negative relationship between customer concentration and CSR's five dimensions. Among them, the negative impact on community dimension is the largest, and the impact on employee dimension is the least. The

results indicate that when faced with the adverse influence of concentrated customer base, firms will respond to different dimensions of CSR to varying degrees. Firms tend to reduce the CSR engagement of non-core stakeholders, and to protect the CSR investments of core stakeholders as much as possible. This is also consistent with our intuition. After all, it is the core stakeholders who truly have a stake in the fate of the firm.

Furthermore, through mechanism analysis, we find that profitability and financial constraints are two potential transmission mechanisms in the relation between customer concentration and CSR performance. This is also consistent with our previous discussion. A concentrated customer base damages the supplier's profitability and increases its financial constraints. When a firm does not have sufficient money to achieve the optimal level of investments, it may sacrifice CSR investments to meet the resources needs of other projects that can see returns in the short term. In particular, financial constraints are also one of the most important factors restricting the development of Chinese firms (Cull *et al*., 2015).

Finally, we also explored the moderating effect of corporate transparency. We see that the higher the corporate transparency, the more salient the negative effect between customer concentration and CSR performance. We try to explain this interesting finding in terms of signalling theory. As a signal mechanism, CSR performance conveys the information that the company operates well, so as to reduce the degree of information asymmetry between the firm and the outside world. However, to maintain such a signal, firms need to pay high costs (Connelly *et al*., 2011). When alternative signalling mechanisms exist, firms will strategically choose low-cost and high-efficiency signals to minimize costs, increase revenue, and deliver signals efficiently. In theory, firms do not need capital outflow for earnings management, and it is not difficult at the operational level. Compared with CSR investment which requires a large amount of money and a long period, improving transparency through lowering the level of earnings management could be regarded as an alternative choice. Our research shows that when

making CSR investments decision, firms will strategically weigh its benefits and costs, and look for signalling mechanisms that match their own conditions to better reduce information asymmetry. It can be seen that, as a firm-level strategy, CSR is not as simple as its literal meaning, but is a choice made by the firm after careful consideration.

7. Conclusion and implications

Based on samples of Chinese publicly listed firms and CSR scores released by Hexun database from 2010 to 2019, this study tests and confirms a negative relationship between customer concentration and firms' CSR performance. The findings still hold after a set of robustness checks, such as alternative measures, lagged variables, IV approach, PSM approach, and model setting change. Our results suggest that the bargaining power view is more persuasive in explaining the outcomes of customer concentration in the Chinese context. Next, we find that customer concentration has a significantly negative influence on all the five dimensions of CSR, but the negative impact on core stakeholders is weaker, and the impact on non-core stakeholders is stronger. In addition, the results of mechanism analysis show that profitability and financial constraints are two potential transmission mechanisms. Finally, our moderating effect analysis shows that the negative association is more pronounced for firms with higher transparency. This moderating effect indicates that a firm may strategically adjust its engagement in CSR activities based on certain internal and external conditions. The empirical evidence documented in our study makes important theoretical contributions and practical implications, as discussed below.

7.1. Theoretical contributions

Theoretically, this study contributes to the literature debating the benefits and risks of having a concentrated customer base. Previous OM literature emphasizes that a few major

customers can bring many benefits to suppliers. However, literature on economics, finance and accounting fields points out that the bargaining power owned by major customers will do harm to suppliers. And the findings of these literature are basically based on the data of developed countries (e.g., US, UK). This contrary view makes us wonder which one is more pervasive in emerging economies. Our study provides new empirical evidence for the bargaining power view to be more pervasive in the Chinese market.

In terms of research perspective, existing literature on the outcomes of customer concentration mainly focuses on firm-level financial or operational variables, few studies consider the possible impact of concentrated customer base on firms' sustainable behaviour. In addition, studies on CSR's antecedents are mainly conducted from institutional, organisational, and individual levels. Little research discusses the determinants of CSR from the perspective of inter-organisational relationship, especially the buyer-supplier relationship. Our study not only enriches the literature on the outcomes of customer concentration, but also makes a marginal contribution to the literature on the antecedents of CSR, and provides a new perspective for future CSR research.

In addition, this study has also contributed to strategic CSR literature. The concept of CSR has become more and more complex since its birth. Correspondingly, as a firm-level strategy, firms also went from simply investing in CSR at the beginning to later strategically using CSR to achieve various purposes. Our research shows that when facing customer risks, a supplier will adjust its CSR engagement in different dimensions. In this process, firms tend to sacrifice the CSR investments of non-core stakeholders to a certain extent to maintain the CSR level of core stakeholders as much as possible. Moreover, CSR serves as a signal used by firms to lower information asymmetry. We find that when there are multiple signalling mechanisms, firms will strategically choose low-cost and high-efficiency signals that match their own conditions to better meet the needs of communication with the outside world. What's more, our results also

indicate that suppliers have the motivation to adjust CSR to cater to major customers. They also have the motivation to use CSR as a shield to divert the attention of stakeholders. Together, our interesting findings have deepened our understanding of strategic CSR behaviour.

Finally, this study also echoes the call for conducting more CSR research in emerging market economies (EMEs) (e.g., Julian & Ofori-dankwa, 2013; Matten & Moon, 2008). The nature of CSR itself determines that it receives more attention in developed countries or regions. In fact, most of the extant studies on CSR are conducted in North America and Europe, where the system is stable and resources are abundant. CSR studies on EMEs are relatively scarce. EMEs are very different from developed economies in terms of economy, politics, culture, and laws, etc. As CSR activities rely heavily on contextual conditions, the omissions of CSR research in EMEs will limit us to a deeper understanding of the antecedents and outcomes of CSR. These omissions also mean that the conclusions of CSR established in developed countries may not hold true in developing countries. Our empirical analysis of CSR activities of Chinese listed firms also shows that, different from the monitoring and certifying role of major customers for suppliers in developed markets, in China, the damage caused by major customers is more salient than the benefits they brought to suppliers. Firms will strategically respond to high customer risk, including reducing CSR investments.

7.2. Managerial implications

This study has several implications for operations and sustainability managers, customers, and regulators. First, managers should be concerned about firms' customer concentration. Although strengthening collaboration and building close relationships with major customers may bring certain benefits to a supplier, the risks of doing so cannot be neglected as well. In Chinese market, major customers are more likely to use their power to do harm to suppliers. In particular, our research shows that a concentrated customer base has a significantly negative

impact on the supplier's CSR performance, making suppliers behave myopically. We suggest that in China, managers should actively expand extensive and multi-channel customer resources, and maintain the customer concentration at a moderate level. Thus, suppliers could avoid negative impacts on financial performance, firm risks, etc. due to excessive dependence on major customers, and they may also possess sufficient resources to realize diversified development strategies, including CSR investments.

Second, for customers, having a close dependent supplier may lead to some unintended outcomes. Although major customers have higher bargaining power when faced with highly dependent suppliers, such power does not always seem to be able to move things toward the expectations of customers. Our research finds that in the case of high customer concentration, a supplier will respond by reducing its own CSR investments, even if major customers can monitor and intervene in the business activities of the supplier and require the supplier to develop in a sustainable direction. We recommend that major customers use their bargaining power cautiously when interacting with suppliers. Customers should reduce their opportunistic behaviour and establish long-term, cooperative, and mutually beneficial relationships with suppliers. Hurting suppliers will ultimately result in a lose-lose situation.

Finally, for regulators, it is necessary to strengthen the regulation of firms with low transparency. Our results show that the negative impact of customer concentration on CSR performance is mitigated when the supplier has high opacity, implying that firms may employ CSR performance to divert the attention of stakeholders. Improved regulation of firms with low transparency can better protect the interests of stakeholders.

7.3. Limitations and future research directions

Although our findings suggest interesting implications, this study suffers from several limitations, which provide some opportunities for future research. First, due to data availability,

we only use econometric method to analyse secondary data of Chinese listed firms. So, the generalizability of our findings in private firms and firms located in other countries or regions will be limited. Future research may conduct a multi-methodological and/or cross-country study to investigate the impact of concentrated customer base on CSR performance based on private firms, and research scenarios can be set in other emerging economies (e.g., Argentina, Brazil, India, and South Africa) (Carter, Sanders & Dong, 2008; Choi, Cheng & Zhao, 2016). For developing countries, it may be more relevant if CSR investments can indeed create value. Due to several factors (e.g., weak protection of the law, fragility of the economy), firms in developing countries are usually exposed to greater uncertainty and higher risks (e.g., 1997 Asian financial crises, 2002 Argentina's debt crises, 2008 global economic crisis, current COVID-19 pandemic). We believe CSR research in emerging economies will be a promising direction in the future.

Second, different from the regulations in the United States, CSRC's policy on the disclosure of firm's customer information only requires a firm to disclose its top five customers. Regardless of whether the sales proportion to a customer is more than ten percent, as long as this customer is the firm's top five customers, its relevant information should be disclosed by the supplier. However, the CSRC does not mandatorily require suppliers to disclose specific names of their customers. Therefore, in our study, many suppliers hide the names of their customers and just use "Customer 1-5" or "Natural person 1-5" as replacements. We only know a supplier's sales amount and proportion to its customers, but we cannot identify the specific identity information of the customer, and we cannot distinguish whether the customer is a government customer or not. Future studies can explore whether there are differences in the impact of customer heterogeneity on CSR performance and the underlying mechanism. In addition, since Hexun started publishing CSR data in 2010, our sample is confined to 2010 and beyond. More sample firms in longer time period may reach more interesting findings.

Third, this study only considers the moderating effect of corporate transparency on the customer concentration-CSR performance link. In fact, there are many kinds of signals a firm transmits to the outside world (e.g., dividend policy, internal control, and government subsidies), and different signals have different costs, benefits, frequency, observability, etc. Future research could explore how different signalling mechanisms moderate the relationship between customer concentration and CSR performance, whether a firm's different signals promote or offset each other, and firm's signal selection process.

Finally, in this study, we only consider one feature of the buyer-supplier relationship (i.e., customer concentration). In fact, the buyer-supplier relationship includes many dimensions (e.g., interdependence, trust, duration and closeness of relationship, etc.). Future research can investigate the impact of different dimensions on sustainable behaviour of supplier or customer. In addition to the dyadic relationship between buyers and suppliers, firms actually exist in a supply chain network (Bellamy, Ghosh & Hora, 2014; Mills, Schmitz & Frizelle, 2004). Different firms occupy different positions in the network. What impact does network position (e.g., centrality, structural hole) have on the firm's own and other firms' CSR behaviour? How is CSR behaviour imitated and diffused among different firms? Exploring these issues will further advance our understanding of strategic CSR behaviour.

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Table 1
Descriptive statistics of sample firms.

Panel A: The distribution of sample firms by industry

CSRC industry code	Industries	Frequency	Percentage (%)
A	Agriculture, forestry, animal husbandry and fishery	267	1.56
B	Mining	406	2.37
C	Manufacturing	11,626	67.86
D	Electricity, heat, gas and water production and supply	516	3.01
E	Construction	485	2.83
F	Wholesale and Retail	733	4.28
G	Transportation, warehousing and postal services	325	1.90
H	Accommodation and catering	38	0.22
I	Information transmission, software and information technology services	1,187	6.93
K	Real estate	705	4.12
L	Leasing and business services	194	1.13
M	Scientific research and technical services	129	0.75
N	Water conservancy, environment and public facilities management	167	0.97
Q	Health and social work	9	0.05
R	Culture, sports and entertainment	181	1.06
S	Comprehensive	164	0.96
Total sample size		17,132	100.00

Panel B: The distribution of sample firms by year

Year	Frequency	Percentage (%)
2010	857	5.00
2011	1,242	7.25

2012	1,841	10.75
2013	2,044	11.93
2014	1,388	8.10
2015	1,720	10.04
2016	1,806	10.54
2017	1,953	11.40
2018	2,134	12.46
2019	2,147	12.53
Total sample size	17,132	100.00

Panel C: The distribution of sample firms by location

Province	Frequency	Percentage (%)
Anhui (AH)	534	3.12
Beijing (BJ)	1,399	8.17
Chongqing (CQ)	229	1.34
Fujian (FJ)	666	3.89
Gansu (GS)	149	0.87
Guangdong (GD)	3,109	18.15
Guangxi (GX)	184	1.07
Guizhou (GZ)	153	0.89
Hainan (HI)	167	0.97
Hebei (HE)	329	1.92
Henan (HA)	454	2.65
Heilongjiang (HL)	158	0.92
Hubei (HB)	472	2.76
Hunan (HN)	539	3.15
Inner Mongolia (IM)	136	0.79
Jilin (JL)	225	1.31

Jiangsu (JS)	1,739	10.15
Jiangxi (JX)	220	1.28
Liaoning (LN)	384	2.24
Ningxia (NX)	71	0.41
Qinghai (QH)	53	0.31
Shandong (SD)	1,058	6.18
Shanxi (SX)	220	1.28
Shaanxi (SN)	211	1.23
Shanghai (SH)	1,067	6.23
Sichuan (SC)	612	3.57
Tianjin (TJ)	216	1.26
Tibet (XZ)	62	0.36
Xinjiang (XJ)	274	1.60
Yunnan (YN)	177	1.03
Zhejiang (ZJ)	1,865	10.89
Total sample size	17,132	100.00

Table 2
Summary statistics.

	N	Mean	SD	P25	P50	P75	Min	Max
CSR	17,132	24.1710	16.6124	15.8200	21.3200	27.1650	-4.2100	74.7500
CC_HHI	17,132	0.0531	0.1007	0.0050	0.0161	0.0514	0.0000	0.6263
CC_Top1	17,132	0.1390	0.1462	0.0464	0.0882	0.1743	0.0035	0.7876
CC_STD	17,132	0.0427	0.0562	0.0092	0.0214	0.0509	0.0005	0.3068
Size	17,132	22.0473	1.2079	21.1878	21.8939	22.7217	19.4516	25.7451
Age	17,132	2.7972	0.3580	2.5649	2.8332	3.0445	1.6094	3.4340
Leverage	17,132	0.4223	0.2087	0.2536	0.4133	0.5777	0.0463	0.9554
ROA	17,132	3.3703	6.8815	1.2921	3.5002	6.4151	-36.7962	20.5052
Cash Holding	17,132	0.1587	0.1266	0.0694	0.1219	0.2078	0.0081	0.6853
CR_5	17,132	0.5218	0.1539	0.4116	0.5261	0.6371	0.1342	0.8617
Financial Slack	17,132	2.5129	2.7071	1.1533	1.6704	2.7236	0.2959	19.3705
Capital Intensity	17,132	2.5548	2.1560	1.3238	1.9493	2.9698	0.3924	14.9246
EM	17,132	0.0614	0.0658	0.0187	0.0420	0.0796	0.0007	0.3840
INS	17,132	0.4172	0.2448	0.2040	0.4316	0.6172	0.0029	0.9045

Table 3
Correlation matrix.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	*CSR*	1.000													
2	*CC_HHI*	-0.042***	1.000												
3	*CC_Top1*	-0.070***	0.954***	1.000											
4	*CC_STD*	-0.052***	0.961***	0.990***	1.000										
5	*Size*	0.301***	-0.004	-0.039***	-0.011	1.000									
6	*Age*	-0.064***	0.044***	0.028***	0.038***	0.147***	1.000								
7	*Leverage*	-0.011	0.019**	0.002	0.016**	0.503***	0.164***	1.000							
8	*ROA*	0.423***	-0.041***	-0.057***	-0.050***	0.021***	-0.079***	-0.340***	1.000						
9	*Cash Holding*	0.118***	-0.018**	-0.013*	-0.014*	-0.242***	-0.146***	-0.411***	0.255***	1.000					
10	*CR_5*	0.166***	0.031***	0.025***	0.028***	0.127***	-0.184***	-0.059***	0.180***	0.102***	1.000				
11	*Financial Slack*	0.035***	0.028***	0.040***	0.030***	-0.330***	-0.132***	-0.624***	0.196***	0.493***	0.091***	1.000			
12	*Capital Intensity*	-0.101***	0.150***	0.146***	0.140***	0.014*	0.101***	-0.026***	-0.200***	-0.025***	-0.081***	0.149***	1.000		
13	*EM*	-0.084***	0.036***	0.039***	0.036***	-0.036***	0.017**	0.122***	-0.251***	-0.015**	-0.033***	-0.046***	0.086***	1.000	
14	*INS*	0.232***	0.057***	0.040***	0.053***	0.406***	0.068***	0.220***	0.102***	-0.023***	0.463***	-0.152***	-0.035***	-0.024***	1.000

Table 4
Baseline results-Customer concentration and CSR performance.

	Dependent Variable = *CSR*		
	(1)	(2)	(3)
CC_HHI	-4.0268***		
	(-3.56)		
CC_Top1		-3.3490***	
		(-4.33)	
CC_STD			-7.9778***
			(-4.00)
Size	4.9120***	4.8921***	4.9087***
	(44.97)	(44.68)	(44.96)
Age	1.5167***	1.5077***	1.5125***
	(4.59)	(4.57)	(4.58)
Leverage	-6.5082***	-6.4699***	-6.4981***
	(-8.29)	(-8.24)	(-8.28)
ROA	0.7854***	0.7848***	0.7847***
	(45.81)	(45.78)	(45.77)
Cash Holding	2.5105**	2.5072**	2.5211**
	(2.54)	(2.54)	(2.55)
CR_5	3.5965***	3.6115***	3.5988***
	(5.06)	(5.09)	(5.07)
Financial Slack	0.0995*	0.1019*	0.1006*
	(1.91)	(1.96)	(1.93)
Capital Intensity	-0.5309***	-0.5265***	-0.5319***
	(-9.36)	(-9.29)	(-9.39)
Constant	-91.7622***	-91.0356***	-91.4971***
	(-32.72)	(-32.31)	(-32.59)
Year	YES	YES	YES
Industry	YES	YES	YES
Province	YES	YES	YES
N	17,132	17,132	17,132
F statistic	92.77	92.85	92.82
Adjusted R^2	0.3893	0.3895	0.3894

Notes: *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$. All p-values are two-tailed. Robust standard errors are in parentheses.

Table 5
Robustness check-Alternative measures of customer concentration.

	Dependent Variable = *CSR*		
	(1)	(2)	(3)
CC_Total5	-2.3247***		
	(-4.34)		
CC_Top1_10%		-0.7460***	
		(-3.46)	
CC_GAP			-3.5106***
			(-4.07)
Size	4.8534***	4.8960***	4.9235***
	(43.74)	(44.58)	(45.23)
Age	1.5000***	1.4789***	1.5026***
	(4.54)	(4.48)	(4.55)
Leverage	-6.4327***	-6.5325***	-6.5098***
	(-8.19)	(-8.32)	(-8.30)
ROA	0.7848***	0.7843***	0.7850***
	(45.78)	(45.74)	(45.79)
Cash Holding	2.4738**	2.4917**	2.5044**
	(2.50)	(2.52)	(2.53)
CR_5	3.6028***	3.5298***	3.5939***
	(5.08)	(4.97)	(5.06)
Financial Slack	0.1025**	0.0975*	0.1004*
	(1.97)	(1.87)	(1.93)
Capital Intensity	-0.5183***	-0.5362***	-0.5351***
	(-9.11)	(-9.48)	(-9.47)
Constant	-89.9756***	-91.0123***	-91.8734***
	(-31.48)	(-32.14)	(-32.82)
Year	YES	YES	YES
Industry	YES	YES	YES
Province	YES	YES	YES
N	17,132	17,132	17,132
F statistic	92.86	92.76	92.82
Adjusted R^2	0.3895	0.3893	0.3894

Notes: *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$. All p-values are two-tailed. Robust standard errors are in parentheses.

Table 6
Robustness check-Alternative measures of CSR and/or customer concentration.

	Dependent Variable = *lnCSR*					
	(1)	(2)	(3)	(4)	(5)	(6)
CC_HHI	-0.1566***					
	(-3.27)					
CC_Top1		-0.1040***				
		(-3.18)				
CC_STD			-0.2341***			
			(-2.78)			
CC_Total5				-0.0805***		
				(-3.57)		
CC_Top1_10%					-0.0176*	
					(-1.94)	
CC_GAP						-0.1079***
						(-2.96)
Size	0.1691***	0.1687***	0.1693***	0.1672***	0.1692***	0.1697***
	(36.58)	(36.40)	(36.64)	(35.60)	(36.35)	(36.82)
Age	0.0372***	0.0368***	0.0369***	0.0365***	0.0360***	0.0366***
	(2.69)	(2.66)	(2.67)	(2.64)	(2.60)	(2.64)
Leverage	-0.1674***	-0.1671***	-0.1682***	-0.1652***	-0.1696***	-0.1684***
	(-4.91)	(-4.90)	(-4.94)	(-4.84)	(-4.98)	(-4.94)
ROA	0.0698***	0.0698***	0.0698***	0.0698***	0.0697***	0.0698***
	(74.67)	(74.64)	(74.63)	(74.64)	(74.60)	(74.64)
Cash Holding	0.0523	0.0524	0.0528	0.0514	0.0525	0.0523
	(1.27)	(1.27)	(1.28)	(1.25)	(1.27)	(1.27)
CR_5	0.1348***	0.1344***	0.1338***	0.1346***	0.1314***	0.1337***
	(4.53)	(4.52)	(4.50)	(4.52)	(4.42)	(4.49)
Financial Slack	0.0054**	0.0054**	0.0054**	0.0055**	0. 0052**	0.0054**
	(2.50)	(2.50)	(2.48)	(2.53)	(2.42)	(2.48)
Capital Intensity	-0.0206***	-0.0207***	-0.0208***	-0.0203***	-0.0211***	-0.0209***
	(-8.26)	(-8.27)	(-8.36)	(-8.09)	(-8.45)	(-8.40)
Constant	-1.0661***	-1.0492***	-1.0655***	-1.0063***	-1.0585***	-1.0754***
	(-9.06)	(-8.87)	(-9.04)	(-8.38)	(-8.89)	(-9.15)
Year	YES	YES	YES	YES	YES	YES
Industry	YES	YES	YES	YES	YES	YES
Province	YES	YES	YES	YES	YES	YES
N	16,382	16,382	16,382	16,382	16,382	16,382
F statistic	113.22	113.21	113.17	113.25	113.11	113.19
Adjusted R^2	0.4470	0.4470	0.4469	0.4471	0.4468	0.4469

Notes: *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$. All p-values are two-tailed. Robust standard errors are in parentheses.

Table 7
Robustness check-Lagged independent and control variables and CSR performance.

	Dependent Variable = *CSR*		
	(1)	(2)	(3)
L.CC_HHI	-2.9505**		
	(-2.15)		
L.CC_Top1		-3.0965***	
		(-3.31)	
L.CC_STD			-7.0737***
			(-2.94)
L.Size	4.8978***	4.8713***	4.8884***
	(36.49)	(36.20)	(36.43)
L.Age	2.3186***	2.3149***	2.3184***
	(6.00)	(5.99)	(6.00)
L.Leverage	-8.8593***	-8.7932***	-8.8271***
	(-9.19)	(-9.12)	(-9.16)
L.ROA	0.5851***	0.5843***	0.5843***
	(24.58)	(24.55)	(24.55)
L.Cash Holding	5.0823***	5.0819***	5.0932***
	(4.31)	(4.31)	(4.32)
L.CR_5	4.8947***	4.9268***	4.9112***
	(5.78)	(5.82)	(5.80)
L.Financial Slack	0.0442	0.0487	0.0468
	(0.71)	(0.78)	(0.75)
L.Capital Intensity	-0.6280***	-0.6194***	-0.6254***
	(-8.86)	(-8.75)	(-8.84)
Constant	-93.8900***	-93.0625***	-93.5253***
	(-27.67)	(-27.31)	(-27.53)
Year	YES	YES	YES
Industry	YES	YES	YES
Province	YES	YES	YES
N	13,323	13,323	13,323
F statistic	54.58	54.66	54.63
Adjusted R^2	0.3218	0.3222	0.3220

Notes: *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$. All p-values are two-tailed. Robust standard errors are in parentheses.

Table 8
Robustness check-Instrumental variable (IV) approach.

Panel A:	*CC_HHI*	*CC_Top1*	*CC_STD*	Panel B:	Dependent Variable = *CSR*		
First Stage	(1)	(2)	(3)	Second Stage	(1)	(2)	(3)
L.CC_IndHHI	0.3769***			*CC_HHIhat*	-38.4579*		
	(6.80)				(-1.71)		
L.CC_IndTop1		0.4503***		*CC_Top1hat*		-24.9778*	
		(7.03)				(-1.70)	
L.CC_IndSTD			0.4315***	*CC_STDhat*			-65.1313*
			(6.72)				(-1.64)
Size	-0.0086***	-0.0157***	-0.0047***	*Size*	4.5562***	4.4917***	4.5813***
	(-10.29)	(-12.80)	(-9.77)		(19.66)	(16.95)	(20.32)
Age	0.0036	0.0014	0.0011	*Age*	2.0909***	1.9896***	2.0277***
	(1.39)	(0.37)	(0.76)		(5.19)	(5.07)	(5.12)
Leverage	0.0276***	0.0450***	0.0152***	*Leverage*	-5.8849***	-5.8248***	-5.9577***
	(4.61)	(5.11)	(4.44)		(-5.36)	(-5.21)	(-5.48)
ROA	0.0001	-0.0001	-0.0000	*ROA*	0.7565***	0.7494***	0.7492***
	(1.12)	(-0.35)	(-0.40)		(39.08)	(39.26)	(39.18)
Cash Holding	0.0061	0.0053	0.0045	*Cash Holding*	4.2963 ***	4.1749***	4.3444***
	(0.78)	(0.46)	(1.01)		(3.55)	(3.48)	(3.59)
CR_5	0.0275***	0.0394***	0.0151***	*CR_5*	4.9856***	4.9053***	4.9053***
	(5.11)	(4.97)	(4.89)		(4.86)	(4.91)	(4.85)
Financial Slack	0.0022***	0.0036***	0.0013***	*Financial Slack*	0.2143***	0.2171***	0.2122**
	(5.25)	(5.66)	(5.29)		(2.62)	(2.62)	(2.59)
Capital Intensity	0.0049***	0.0072***	0.0024***	*Capital Intensity*	-0.4293***	-0.4386***	-0.4641***
	(11.76)	(11.71)	(9.90)		(-3.37)	(-3.56)	(-4.10)
Constant	0.1611***	0.3542***	0.1026***	*Constant*	-86.1729***	-82.5806***	-85.1121***
	(7.46)	(10.67)	(8.10)		(-16.25)	(-11.62)	(-14.28)

Year	YES	YES	YES	*Year*	YES	YES	YES
Industry	YES	YES	YES	*Industry*	YES	YES	YES
Province	YES	YES	YES	*Province*	YES	YES	YES
N	13,323	13,323	13,323	*N*	13,323	13,323	13,323
Adjusted R^2	0.2521	0.2399	0.2246	*Centered* R^2	0.3745	0.3793	0.3777
Partial R^2	0.0035	0.0037	0.0034	*Wald* χ^2	8669.81	8737.15	8714.60
F statistic	46.23	49.47	45.21	*F statistic*	72.82	73.38	73.19
				Anderson canon. corr. LM statistic	46.480***	49.730***	45.459***
					(0.000)	(0.000)	(0.000)
				Cragg-Donald Wald F statistic	46.226	49.471	45.207
				Stock-Yogo weak ID test critical values	16.38	16.38	16.38
				Sargan statistic	0.000	0.000	0.000

Notes: *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$. All p-values are two-tailed. Robust standard errors are in parentheses.

Table 9
Robustness check-Propensity score matching (PSM) approach.

Panel A: First stage Logit regression results

	Dependent Variable = *CC_Top1_10%*	
	coefficients	*z-statistics*
Size	-0.3577***	-18.90
Age	-0.1107**	-2.02
Leverage	0.6172***	4.65
ROA	-0.0013	-0.46
Cash Holding	-0.0405	-0.24
CR_5	0.2134*	1.78
Financial Slack	0.0350***	3.98
Capital Intensity	0.1097***	10.95
Constant	7.8284***	16.37
Year	YES	
Industry	YES	
Province	YES	
N	17,131	
Pseudo R^2	0.1155	

Panel B: Covariate balance check of the matching

	Mean		
	Treatment group-Firms with major customers > 10% (*N*=5737)	Control group-Firms without major customers > 10% (*N*=5737)	*p* values
Size	21.9610	21.9280	0.119
Age	2.7848	2.7859	0.865
Leverage	0.4140	0.4119	0.582
ROA	3.3893	3.2829	0.400
Cash Holding	0.1628	0.1628	0.995
CR_5	0.5208	0.5210	0.918
Financial Slack	2.5896	2.6029	0.796
Capital Intensity	2.5401	2.5554	0.687

Panel C: Regression results of matched samples

	Dependent Variable = *CSR*		
	(1)	(2)	(3)
CC_HHI	-3.9709***		
	(-2.86)		
CC_Top1		-2.9320***	
		(-3.26)	
CC_STD			-6.9554***

			(-2.97)
Size	4.5297***	4.5324***	4.5413***
	(32.70)	(32.72)	(32.79)
Age	1.5000***	1.4898***	1.4942***
	(3.89)	(3.86)	(3.87)
Leverage	-4.7851***	-4.7737***	-4.7914***
	(-5.13)	(-5.12)	(-5.14)
ROA	0.8192***	0.8186***	0.8185***
	(40.62)	(40.61)	(40.60)
Cash Holding	3.1794***	3.1738***	3.1815***
	(2.77)	(2.77)	(2.77)
CR_5	4.6097***	4.6007***	4.5973***
	(5.43)	(5.42)	(5.41)
Financial Slack	0.1091*	0.1099*	0.1092*
	(1.80)	(1.81)	(1.80)
Capital Intensity	-0.5963***	-0.5981***	-0.6006***
	(-8.33)	(-8.36)	(-8.40)
Constant	-84.0342***	-83.8368***	-84.1305***
	(-24.23)	(-24.16)	(-24.26)
Year	YES	YES	YES
Industry	YES	YES	YES
Province	YES	YES	YES
N	11,474	11,474	11,474
F statistic	57.84	57.87	57.85
Adjusted R^2	0.3689	0.3690	0.3689

Notes: *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$. All p-values are two-tailed. Robust standard errors are in parentheses.

Table 10
Robustness check-Non-linearity test.

	Dependent Variable = *CSR*		
	(1)	(2)	(3)
CC_HHI×CC_HHI	6.4675		
	(1.17)		
CC_Top1×CC_Top1		3.8710	
		(1.23)	
CC_STD×CC_STD			13.6320
			(0.66)
CC_HHI	-6.3346***		
	(-2.79)		
CC_Top1		-4.5954***	
		(-3.60)	
CC_STD			-9.8801***
			(-2.82)
Size	4.8994***	4.8768***	4.9026***
	(44.65)	(44.26)	(44.75)
Age	1.5073***	1.4983***	1.5083***
	(4.56)	(4.54)	(4.57)
Leverage	-6.4864***	-6.4561***	-6.4915***
	(-8.26)	(-8.22)	(-8.27)
ROA	0.7850***	0.7841***	0.7844***
	(45.77)	(45.72)	(45.73)
Cash Holding	2.5266**	2.5062**	2.5276**
	(2.56)	(2.54)	(2.56)
CR_5	3.6138***	3.6058***	3.5995***
	(5.09)	(5.08)	(5.07)
Financial Slack	0.1000*	0.1021*	0.1005*
	(1.92)	(1.96)	(1.93)
Capital Intensity	-0.5297***	-0.5266***	-0.5317***
	(-9.34)	(-9.27)	(-9.39)
Constant	-91.7368***	-91.1911***	-91.7171***
	(-32.68)	(-32.38)	(-32.68)
Year	YES	YES	YES
Industry	YES	YES	YES
Province	YES	YES	YES
N	17,132	17,132	17,132
F statistic	92.01	92.10	92.04
Adjusted R^2	0.3893	0.3895	0.3894

Notes: *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$. All p-values are two-tailed. Robust standard errors are in parentheses.

Table 11
Customer concentration and CSR's five dimensions.

Panel A: *CC_HHI* and CSR's five dimensions

	Investor	Employee	Supplier, customer, and consumer	Environment	Community
CC_HHI	-0.9822***	-0.2951	-0.9474***	-0.6822*	-1.1611***
	(-3.19)	(-1.26)	(-2.62)	(-1.72)	(-3.74)
Controls	YES	YES	YES	YES	YES
Year	YES	YES	YES	YES	YES
Industry	YES	YES	YES	YES	YES
Province	YES	YES	YES	YES	YES
N	17,132	17,132	17,132	17,132	17,132
F statistic	324.33	48.64	40.76	42.23	58.80
Adjusted R²	0.6919	0.2486	0.2164	0.2226	0.2865

Panel B: *CC_Top1* and CSR's five dimensions

	Investor	Employee	Supplier, customer, and consumer	Environment	Community
CC_Top1	-0.8609***	-0.3407**	-0.7039***	-0.5550**	-0.8909***
	(-4.08)	(-2.12)	(-2.85)	(-2.04)	(-4.19)
Controls	YES	YES	YES	YES	YES
Year	YES	YES	YES	YES	YES
Industry	YES	YES	YES	YES	YES
Province	YES	YES	YES	YES	YES
N	17,132	17,132	17,132	17,132	17,132
F statistic	324.50	48.67	40.77	42.24	58.85
Adjusted R²	0.6920	0.2488	0.2165	0.2227	0.2866

Panel C: *CC_STD* and CSR's five dimensions

	Investor	Employee	Supplier, customer, and consumer	Environment	Community
CC_STD	-1.9801***	-0.7764*	-1.8208***	-1.2724*	-2.1314***
	(-3.64)	(-1.88)	(-2.86)	(-1.82)	(-3.90)
Controls	YES	YES	YES	YES	YES
Year	YES	YES	YES	YES	YES
Industry	YES	YES	YES	YES	YES
Province	YES	YES	YES	YES	YES
N	17,132	17,132	17,132	17,132	17,132
F statistic	324.41	48.66	40.77	42.23	58.82
Adjusted R²	0.6920	0.2487	0.2165	0.2227	0.2865

Notes: *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$. All p-values are two-tailed. Robust standard errors are in parentheses.

Table 12
Potential mechanism analysis (Profitability).

Panel A: Customer concentration and profitability

	Dependent Variable = *ROA*		
	(1)	(2)	(3)
CC_HHI	-0.8437*		
	(-1.71)		
CC_Top1		-1.1085***	
		(-3.27)	
CC_STD			-2.4689***
			(-2.82)
Controls	YES	YES	YES
Year	YES	YES	YES
Industry	YES	YES	YES
Province	YES	YES	YES
N	16,361	16,361	16,361
F statistic	44.67	44.75	44.72
Adjusted R^2	0.2364	0.2368	0.2367

Panel B: Customer concentration, profitability, and CSR performance

	Dependent Variable = *CSR*		
	(1)	(2)	(3)
CC_HHI	-5.6170***		
	(-4.85)		
CC_Top1		-4.3431***	
		(-5.46)	
CC_STD			-10.3795***
			(-5.06)
ROA	0.8784***	0.8770***	0.8775***
	(47.75)	(47.67)	(47.70)
Controls	YES	YES	YES
Year	YES	YES	YES
Industry	YES	YES	YES
Province	YES	YES	YES
N	16,361	16,361	16,361
F statistic	86.51	86.59	86.54
Adjusted R^2	0.3795	0.3797	0.3795

Notes: *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$. All p-values are two-tailed. Robust standard errors are in parentheses.

Table 13
Potential mechanism analysis (Financial constraints).

Panel A: Customer concentration and financial constraints (firm size)

	Dependent Variable = *Size*		
	(1)	(2)	(3)
CC_HHI	-1.0492***		
	(-13.29)		
CC_Top1		-0.8838***	
		(-16.46)	
CC_STD			-1.7825***
			(-12.81)
Controls	YES	YES	YES
Year	YES	YES	YES
Industry	YES	YES	YES
Province	YES	YES	YES
N	17,132	17,132	17,132
F statistic	111.83	113.24	111.64
Adjusted R^2	0.4308	0.4339	0.4304

Panel B: Customer concentration, financial constraints, and CSR performance

	Dependent Variable = *CSR*		
	(1)	(2)	(3)
CC_HHI	-3.9380***		
	(-3.48)		
CC_Top1		-3.2820***	
		(-4.24)	
CC_STD			-7.8180***
			(-3.93)
Size	4.9114***	4.8919***	4.9082***
	(44.97)	(44.67)	(44.96)
Controls	YES	YES	YES
Year	YES	YES	YES
Industry	YES	YES	YES
Province	YES	YES	YES
N	17,132	17,132	17,132
F statistic	93.51	93.59	93.56
Adjusted R^2	0.3892	0.3894	0.3893

Notes: *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$. All p-values are two-tailed. Robust standard errors are in parentheses.

Table 14
Moderating effect analysis.

	Dependent Variable = *CSR*								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
CC_HHI×EM	39.5722***						33.7460**		
	(2.81)						(2.39)		
CC_Top1×EM		26.9640***						23.6009**	
		(2.74)						(2.40)	
CC_STD×EM			69.8727***						60.4347**
			(2.74)						(2.36)
CC_HHI×INS				-19.7644***			-18.7287***		
				(-4.68)			(-4.42)		
CC_Top1×INS					-14.3595***			-13.8195***	
					(-5.04)			(-4.84)	
CC_STD×INS						-36.9186***			-35.3644***
						(-4.95)			(-4.73)
CC_HHI	-4.5581***			-3.3816***			-3.8974***		
	(-4.00)			(-2.96)			(-3.38)		
CC_Top1		-3.6610***			-2.9771***			-3.2801***	
		(-4.71)			(-3.82)			(-4.18)	
CC_STD			-8.7805***			-6.9365***			-7.7161***
			(-4.38)			(-3.45)			(-3.82)
EM	5.2604***	5.2746***	5.2649***				5.2204***	5.2310***	5.2136***
	(3.25)	(3.25)	(3.25)				(3.22)	(3.23)	(3.22)
INS				1.2104**	1.2689**	1.2256**	1.1924**	1.2498**	1.2080**
				(2.24)	(2.35)	(2.27)	(2.20)	(2.31)	(2.23)
Size	4.9482***	4.9251***	4.9432***	4.8728***	4.8456***	4.8679***	4.9063***	4.8772***	4.9004***
	(45.20)	(44.89)	(45.18)	(42.70)	(42.38)	(42.69)	(42.91)	(42.58)	(42.89)

Age	1.5113***	1.5019***	1.5085***	1.4062***	1.3808***	1.3869***	1.4039***	1.3785***	1.3863***
	(4.58)	(4.55)	(4.57)	(4.20)	(4.13)	(4.15)	(4.20)	(4.12)	(4.15)
Leverage	-6.6570***	-6.6079***	-6.6382***	-6.6797***	-6.6460***	-6.6600***	-6.8190***	-6.7777***	-6.7933***
	(-8.47)	(-8.41)	(-8.45)	(-8.51)	(-8.47)	(-8.49)	(-8.68)	(-8.63)	(-8.65)
ROA	0.7987***	0.7986***	0.7984***	0.7842***	0.7837***	0.7837***	0.7972***	0.7972***	0.7970***
	(45.60)	(45.61)	(45.59)	(45.76)	(45.75)	(45.74)	(45.54)	(45.55)	(45.53)
Cash Holding	2.3325**	2.3293**	2.3426**	2.2946**	2.3181**	2.3299**	2.1321**	2.1522**	2.1647**
	(2.36)	(2.36)	(2.37)	(2.32)	(2.34)	(2.35)	(2.15)	(2.17)	(2.19)
CR_5	3.5563***	3.5680***	3.5567***	2.8193***	2.7887***	2.8252***	2.7854***	2.7543***	2.7898***
	(5.01)	(5.03)	(5.01)	(3.50)	(3.46)	(3.51)	(3.46)	(3.42)	(3.46)
Financial Slack	0.1022*	0.1049**	0.1035**	0.1070**	0.1093**	0.1085**	0.1092**	0.1119**	0.1109**
	(1.96)	(2.01)	(1.99)	(2.05)	(2.09)	(2.08)	(2.09)	(2.15)	(2.13)
Capital Intensity	-0.5301***	-0.5249***	-0.5307***	-0.5339***	-0.5277***	-0.5335***	-0.5327***	-0.5260***	-0.5322***
	(-9.35)	(-9.26)	(-9.38)	(-9.42)	(-9.31)	(-9.43)	(-9.40)	(-9.29)	(-9.41)
Constant	-92.6745***	-92.1336***	-92.5027***	-90.2707***	-89.5265***	-90.0285***	-90.9289***	-90.1494***	-90.6698***
	(-33.06)	(-32.81)	(-33.00)	(-30.00)	(-29.71)	(-29.92)	(-30.19)	(-29.89)	(-30.11)
Year	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry	YES	YES	YES	YES	YES	YES	YES	YES	YES
Province	YES	YES	YES	YES	YES	YES	YES	YES	YES
N	17,132	17,132	17,132	17,132	17,132	17,132	17,132	17,132	17,132
F statistic	91.50	91.58	91.54	91.60	91.74	91.69	90.34	90.47	90.42
Adjusted R^2	0.3900	0.3902	0.3901	0.3902	0.3906	0.3904	0.3908	0.3911	0.3910

Notes: *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$. All p-values are two-tailed. Robust standard errors are in parentheses.