The product market power of major customer firms and their suppliers’ performance

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\textbf{ABSTRACT}
We find that when a major customer has greater market power in its industry, its supplier firm exhibits better performance. The effect of the major customer’s market power on its supplier’s performance is more pronounced when the economic bonding between the customer firm and the supplier is stronger, when the customer firm is geographically closer to its supplier, and when the relationship between the two firms matures. Furthermore, we document that a customer firm’s product market power increases demand stability for its supplier, reduces the supplier’s cost of debt, and improves the supplier’s investment efficiency.

\textbf{KEYWORDS}
Customer–supplier relationship; product market power; firm performance

1. Introduction

Because of globalisation and the development of information technology since the 1990s, firms have enhanced the cooperation with partners in their supply chains, and the relationships between a firm and these partners have played an increasingly important role in its operations. Because firms compete partly through their supply chains (Christopher, 1999), firms with better supply chain management are better positioned to gain competitive advantages in the product market. Thus, it is important to understand how supply chain characteristics influence firm performance.

Accounting and finance research demonstrates ongoing interest in the economic impact of supply chain characteristics. Several studies show that major customers’ earnings news affects the market value of their suppliers (L. Cohen & Frazzini, 2008; Pandit et al., 2011; Wei et al., 2018) and the suppliers’ bank loan contracts (Kim & Henderson, 2015). Recent studies also examine the effect of customer-base concentration on firms’ operations and performance (e.g. Irvine et al., 2016; Patatoukas, 2012). However, despite the progress in this area, prior studies largely ignore the specific characteristics of customer firms (Wang & Gao, 2017b), and thus provide limited insights into how customer characteristics influence a firm’s performance.

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To address this gap in the literature, we investigate how the product market power of a major customer, an important customer feature, affects its supplier’s performance.

A major customer’s product market power can influence the supplier’s performance in two opposite directions. On one hand, a major customer with greater market power can have a stronger incentive to support the operations of its supplier (and be more capable of doing so), which benefits the supplier’s performance. A leading firm in its market may be eager to cooperate with its supplier to maintain its own competitive advantage. Relatedly, due to its persistent cash flow and profitability (Datta et al., 2013), the firm can generate stable revenues for its supplier and reduce the supplier’s operational risk. On the other hand, a major customer with greater market power has stronger bargaining power in negotiations with its supplier (Porter, 1979), and thus can impair its supplier’s profitability by demanding favourable terms at the expense of its supplier’s interests, e.g. by requiring a lower purchase price and more trade credits (Zhang et al., 2012). Therefore, whether the product market power of a major customer firm ultimately benefits its supplier’s performance remains an open empirical question.

To address this question, we hand-collected a comprehensive sample of supplier firms and their major customers among Chinese public firms. Following prior studies (Datta et al., 2013; Peress, 2010), we measure a firm’s product market power with the industry-adjusted Lerner index. Using return on assets and return on equity to proxy for firms’ performance, we find that when a major customer firm has greater product market power, its supplier exhibits better performance. The effect of a major customer’s market power on its supplier’s performance is economically significant, in that a one standard deviation increase in a firm’s market power index on average translates into an 11.82% increase in return on assets and 21.07% increase in return on equity for the firm. This finding is consistent with the notion that a major customer with stronger product market power benefits its supplier’s performance more.

We further examine the economic factors shaping the relation between a major customer’s market power and its supplier’s performance. We start by examining the impact of the economic bonding between the two firms, as a stronger economic bond can make the customer’s support more beneficial for its supplier. As expected, we find that the effect of a major customer’s market power increases with the economic bonding. Second, we investigate the role of the geographic distance between a major customer and its supplier in shaping the effect of a major customer’s market power. When a major customer is closer to its supplier, it can collaborate with the supplier more easily. As expected, we find that the impact of a major customer’ product market power on its supplier’s performance increases with the geographic proximity between the customer firm and its supplier. Finally, we explore the moderating effect of customer–supplier relationship maturity. As the relationship between a major customer and its supplier matures, the customer can support the supplier more. As expected, we find that the effect of a major customer’s market power on its supplier’s performance is more pronounced when their relationship matures.
We also examine the channels through which the product market power of a major customer influences its supplier’s performance. We find that a major customer with greater market power has more stable demand and its supplier’s debt financing costs are lower. In addition, we show that a major customer’s market power improves the supplier’s investment efficiency.

Our study makes three primary contributions to the existing literature. First, it expands the literature on the economic impact of customer features. Prior research in this area mainly examines the effects of customer-base concentration on firm performance and firm policies, but there is limited research on how customer-specific features influence suppliers’ performance. To address the gap in the literature, we focus on the product market power of major customers, which reflects the competitive position of the customer firm in its industry and thus can potentially deeply influence its supplier’s performance. To the best of our knowledge, our study is the first to examine the effect of customer market power on a supplier’s performance, and thus advances the literature on the economic impact of customer features.

Second, this study contributes to the discourse on whether major customers benefit their suppliers’ operations. Prior studies provide opposite views on the role of major customers in suppliers’ operations. One stream of literature maintains that major customers benefit their suppliers’ operations. Specifically, major customers can help their suppliers to develop business (Itzkowitz, 2015), provide persistent revenues and reputation certification for their suppliers (Li et al., 2018a), and improve the operational and investment efficiency of their suppliers (Chu et al., 2017). Patatoukas (2012) also shows that major customers generally benefit their suppliers’ performance. The other stream of literature argues that major customers can impair their suppliers’ operations. Specifically, due to the strong bargaining power of major customers, they can demand more price discounts, more trade credits, and other favourable terms in the transactions with their suppliers, which can impair the suppliers’ performance (Galbraith, 1952). Showing a positive effect of major customers’ market power on suppliers’ performance, this study suggests that different major customers can have different impacts on their suppliers’ performance. Thus, it is important to differentiate major customers with different characteristics to better understand the role of major customers in their suppliers’ operations.

Third, our study enriches the literature on the economic impact of product market competition. Extant research has examined the role of industry competition in shaping firms’ performance. However, how firms’ competitive positions influence their business partners’ performance is still not well understood. Filling this void in the literature, our study shows that market leaders help their suppliers improve performance, establishing an important link between a firm’s competitive position and its supplier’s performance.

The rest of the paper is organised as follows. Section 2 reviews the relevant literature and develops our hypothesis. Section 3 explains the sample and the research design. Section 4 examines the relation between customer market power and supplier performance and Section 5 presents the results of several additional tests. Section 6 concludes the paper.
2. Literature review and hypothesis development

2.1. Research on product market competition

The effects of product market competition on firms’ financial policies and corporate governance have attracted significant attention from both accounting and finance scholars. One stream of research in this area mainly focuses on the impact of industry competition. Competition in a specific industry is often measured with the Herfindahl index for that industry (Giroud & Mueller, 2011; Verrecchia & Weber, 2006). Prior research finds that industry competition influences firms’ idiosyncratic risk, investments, financing, cash holdings, information disclosure, and agency problems (Chen & Wang, 2015; Giroud & Mueller, 2011; Han & Zhou, 2011; Jiang et al., 2008; Verrecchia & Weber, 2006; H. Wu et al., 2012; Yi et al., 2010).

The other stream of literature in this area examines the economic impact of a firm’s competitive position in its industry. A firm’s competitive position is generally measured with the Lerner index (Datta et al., 2013; Gaspar & Massa, 2006; Peress, 2010). Market leaders, i.e. firms with strong product market power, usually provide unique and high-quality products and thus are more able to influence market prices and control business risk (Datta et al., 2013; Kubick et al., 2015; Zhou & Zhou, 2014). When confronted with adverse business shocks, firms with strong product market power are better able to mitigate the negative effects of the shocks on their profits, cash flows, and performance stability, which leads to more accurate analysts’ forecasts of the firms’ earnings, lower idiosyncratic risks of the firms’ stocks, and more efficient stock prices (Datta et al., 2011; Gaspar & Massa, 2006; Peress, 2010; H. Wu et al., 2012). Furthermore, because earnings of firms with greater product market power are less volatile, they are less likely to take action to smooth their earnings (Datta et al., 2013; Zeng et al., 2016; Zhou & Zhou, 2014). In addition, because these firms more effectively hedge against negative outcomes, they can engage in more risk-taking activities such as tax avoidance (Kubick et al., 2015).

Prior studies also investigate the effect of product market power on trade credit and provide mixed evidence. On one hand, Zhang et al. (2012) find that firms with stronger product market power are less likely to provide funds for their business partners and are more likely to use funds from these partners. On the other hand, Y. Wu et al. (2017) show that firms with stronger product market power provide more trade credit to their customers and suppliers.

To sum up, the existing literature provides extensive evidence that a firm’s product market competition influences its performance and business decisions. However, there is limited research on whether that competition affects its business partners’ performance. Our study aims to address this gap the literature by investigating the effect of a firm’s product market power on its supplier’s performance.

2.2. Research on the economic effects of customer features

There is ongoing debate on whether major customers benefit their suppliers’ performance. The traditional view argues that major customers can rely on their
bargaining power to pursue their own interests at the expense of their suppliers’ interests. Specifically, major customers can leverage their dominant positions to pressure their suppliers to cut prices, to extend trade credit, and to store extra inventories (Galbraith, 1952), impairing the suppliers’ performance (Galbraith & Stiles, 1983; Gosman & Kohlbeck, 2009). Consistent with this view, Li et al. (2018a) find a negative correlation between customer-base concentration and the supplier’s performance.

The other view posits that major customers can benefit their suppliers’ performance. Patatoukas (2012) argues that because supplier firms can collaborate closely with their major customers, having those customers can benefit their performance. Analysing a large sample of U.S. public firms, Patatoukas (2012) provides empirical evidence that major customers are beneficial to their suppliers’ performance. Similarly, examining a large sample of Chinese public firms, Chen and Wang (2014) document that major customers have a positive effect on their suppliers’ performance. Irvine et al. (2016) further point out that the impact of major customers on their suppliers’ performance is a dynamic process. In the early stage of the relationship between the two parties, major customers impair the operating performance of their suppliers, but as the customer-supplier relationship becomes mature in the late stage, major customers help enhance their suppliers’ performance. D. A. Cohen and Li (2020) differentiate major government customers from major corporate customers and find that major government customers benefit their suppliers’ operating performance, but major corporate customers undermine their suppliers’ performance.

Besides analysing the relation between major customers and suppliers’ performance, the extant literature examines whether major customers benefit their suppliers from different angles. On one hand, several studies show that major customers are harmful to their suppliers’ development. Specifically, prior studies find that major customers often require their suppliers to make relationship-specific investments which increase the suppliers’ operational risk, mitigating their investments in innovation (Campello & Gao, 2017; Chen, 2016). In addition, to reduce the operational risk resulting from the loss of large customers, firms with concentrated customer bases tend to hold more cash (Itzkowitz, 2013), which impairs their investment efficiency. Furthermore, several studies show that concentrated customer-bases lead to higher costs of equity and of debt (Campello & Gao, 2017; Dhaliwal et al., 2016; Wang & Gao, 2017b).

On the other hand, major customers can bring benefits to their suppliers in several ways. Chu et al. (2017) find that information communication between a supplier firm and its major customer can facilitate the firm’s innovation. Prior studies also show that firms with major customers are subject to lower loan spreads and fewer loan covenants because major customers monitor their suppliers to ensure stable operations and help enhance the suppliers’ reputation (Cen et al., 2016; Li et al., 2018b). Furthermore, Wang and Gao (2017a) document that information sharing by major customers reduce their suppliers’ uncertainty about future demand and lower cost stickiness for the suppliers.

Previous research also examines the economic effect of major customers’ news. L. Cohen and Frazzini (2008) find that investors underestimate the implication of major customers’ news on their suppliers and thus the suppliers’ future stock returns are
positively associated with the major customers’ concurrent stock returns. Pandit et al. (2011) show that the stock prices of suppliers react to the earnings news of their major customers. Cheng and Eshleman (2014) further show that suppliers’ stock returns around their own earnings announcements are negatively associated with their stock returns around their major customers’ earlier earnings announcements, suggesting that investors in the suppliers overreact to their major customers’ earnings news. In addition, Kim and Henderson (2015) document that when major customers exhibit better performance, their suppliers are subject to more favourable loan contract terms.

To sum up, major customers deeply influence their suppliers’ operations, performance, and financial policies. While prior studies examine how customer-base concentration and earnings news of major customers influence suppliers, the effects of major customers’ product market power on their suppliers are still understudied. We address this gap in the literature by examining the potential impact of major customers’ product market power on their suppliers’ performance.

2.3. Major customers’ product market power and their suppliers’ performance

Major customers’ product market power can benefit their suppliers for at least three reasons. First, firms with strong market power are generally market leaders in their own industries and their reputation can benefit their suppliers’ performance. Specifically, the reputation of market leaders helps certify the value of their supplier firms, which can reduce the suppliers’ cost of debt and enhance their competitiveness. Likewise, having a major customer with strong product market power can increase the supplier’s reputation with other potential customers, increasing their market share and sales (Jackson, 1985).

Second, the business of firms with strong market power is generally stable, and this stability has a positive effect on their suppliers’ performance. Datta et al. (2013) document that firms with greater market power are more able to handle exogenous shocks and that their business is more stable (Datta et al., 2013). In turn, demand from such customers will be more stable, facilitating their suppliers’ operations and investments (D. A. Cohen & Li, 2020).

Third, major customers with great market power have stronger incentives and are more able to support their suppliers. Increasingly, the competitiveness of a firm depends on the competitiveness of its supply chain. In order to maintain competitive advantages, customers with great market power are more willing to closely cooperate with their suppliers, including sharing information and resources, which boosts the suppliers’ operations and investments (Chen et al., 2019). In addition, due to their superior performance, customers with stronger market power are more capable of supporting their suppliers’ development.

At the same time, an opposite effect could take place: major customers with strong market power can have greater bargaining power in negotiations with their suppliers, and their advantage in negotiations can impair the suppliers’ performance. Specifically, major customers with strong market power can be in a better position to cut purchase prices, require trade credit, and push their suppliers to help manage inventories (Chen & Wang, 2015; Kulp, 2002; Zhang et al., 2012), which can have a negative effect on their suppliers’
performance. As the result of the countervailing effects, we propose the following competitive hypotheses:

H1a: When major customers have greater product market power, their suppliers exhibit better performance.

H1b: When major customers have greater product market power, their suppliers exhibit poorer performance.

3. Sample and research design

3.1. Sample and data

Our initial sample includes the Chinese public firms that disclosed their top five customers during our sample period of 2008–2018. Then, we identify the top five customer firms that are also public firms by matching the customer names with the public firm names in the China Stock Market Accounting Research (CSMAR) and Wind databases. If a major customer firm cannot be identified in the CSMAR or Wind database, we search its name with Baidu.com or TianYanCha.com to determine whether it is a Chinese public firm. We remove the major customers that are not public firms because their financial data are not publicly available. We also drop firms in the finance industry, the observations without necessary data, and the observations with unreliable data. Our final sample includes 1,433 customer-supplier-year observations. We obtain financial data and stock return data from the CSMAR database. We winsorise all continuous variables at the 1% and 99% levels to address the outlier problem.

3.2. Research design

3.2.1. Measure of product market power

We measure a firm’s product market power with the industry-adjusted Lerner Index (Datta et al., 2013; Peress, 2010). The Lerner Index is also called the price-cost margin and is defined as the difference between the product price and the product marginal cost, scaled by the product price.

Prior studies typically construct the Lerner Index as earnings before interest, tax, depreciation, and non-recurring gains and losses (EBITDA) divided by sales. To better capture a customer firm’s competitive position in its industry, we use the industry-adjusted Lerner Index (EPCM_C), which is calculated as the customer firm’s Lerner Index minus the sale-weighted average Lerner Index of all firms in the same industry. A higher value of EPCM_C indicates greater product market power. Our industry classification is based on the industry codes that the China Securities Regulatory Commission (CSRC) issued in 2012.
3.2.2. Regression model of the baseline analysis

We adopt the following model to examine the effect of a major customer’s market power on its supplier’s performance:

\[
\text{PERFORM} = \beta_0 + \beta_1 \text{EPCM} + \beta_2 \text{SIZE} + \beta_3 \text{LEV} + \beta_4 \text{TOBINQ} + \beta_5 \text{AGE} + \beta_6 \text{LIQUID} \\
+ \beta_7 \text{RET} + \beta_8 \text{SOE} + \beta_9 \text{TOP1} + \beta_{10} \text{HHI} + \beta_{11} \text{CC} + \beta_{12} \text{SIZE}_C \\
+ \beta_{13} \text{LEV}_C + \beta_{14} \text{RET}_C + \beta_{15} \text{SC}_C + \epsilon
\]  

(1)

where \text{EPCM} is the industry-adjusted Lerner Index of the major customer firm and \text{PERFORM} is the supplier’s performance. Following Patatoukas (2012), we use return on total assets (\text{ROA}) and return on equity (\text{ROE}) to measure firm performance, where \text{ROA} (\text{ROE}) is calculated as net income before extraordinary items in the current year divided by total assets (equity) at the end of the prior year.

We select control variables following Patatoukas (2012) and Li et al. (2018a). Specifically, we control for several characteristics of the supplier firms including firm size (\text{SIZE}), leverage (\text{LEV}), liquidity (\text{LIQUID}), stock market performance (\text{RET}), growth opportunity (\text{TOBINQ}), firm age (\text{AGE}), the competition in its industry (\text{HHI}), ownership of the largest shareholder (\text{TOP1}), an indicator variable for being a state-owned firm (\text{SOE}), and customer-base concentration (\text{CC}). We also control for several characteristics of the major customer firms including firm size (\text{SIZE}_C), leverage (\text{LEV}_C), stock return (\text{RET}_C), and supplier-base concentration (\text{SC}_C). We further include year and industry fixed effects, and use robust standard errors adjusted for heteroscedasticity. Detailed definitions of the variables are presented in the Appendix.

4. Empirical results

4.1. Descriptive statistics and variable correlation

Table 1 reports descriptive statistics of the main variables. The minimum (maximum) value of \text{EPCM} is \(-0.270\) (0.283), and the standard deviation is 0.074, showing that major

| Variable | Observations | Mean | S.D. | Min. | Medium | Max. |
|----------|--------------|------|------|------|--------|------|
| ROA      | 1433         | 0.033| 0.062| -0.261 | 0.031  | 0.203 |
| ROE      | 1433         | 0.046| 0.146| -0.830 | 0.057  | 0.462 |
| EPCM_C   | 1433         | -0.003| 0.074| -0.270 | -0.006 | 0.283 |
| SIZE     | 1433         | 21.912|1.222|19.506 |21.757 |25.049 |
| LEV      | 1433         | 0.238| 0.301| -0.702 | 0.276  | 0.916 |
| AGE      | 1433         | 2.723| 0.391| 1.099  | 2.773  | 3.466 |
| TOBINQ   | 1433         | 2.492| 1.772| 0.894  | 1.899  | 11.423 |
| LIQUID   | 1433         | 0.552| 0.202| 0.121  | 0.569  | 0.965 |
| RET      | 1433         | 0.195| 0.723| -0.635 | -0.010 | 3.449 |
| SOE      | 1433         | 0.438| 0.496| 0.000  | 0.000  | 1.000 |
| TOP1     | 1433         | 0.364| 0.156| 0.093  | 0.333  | 0.752 |
| HHI      | 1433         | 0.080| 0.073| 0.014  | 0.057  | 0.414 |
| CC       | 1433         | 0.340| 0.216| 0.030  | 0.287  | 0.935 |
| SIZE_C   | 1433         | 24.136|1.968|20.476 |24.060 |28.505 |
| LEV_C    | 1433         | 0.419| 0.219| -0.321 | 0.458  | 0.796 |
| RET_C    | 1433         | 0.122| 0.553| -0.669 | -0.033 | 2.831 |
| SC_C     | 1433         | 0.302| 0.180| 0.022  | 0.273  | 0.859 |

This table presents the summary statistics of the variables used in the main tests. All variables are defined in the Appendix.
customers’ market power varies widely in our sample. The mean values of $SIZE$ and $SIZE_C$ are 21.912 and 24.136 respectively, indicating that the major customer firms are on average larger than their suppliers, which is similar to the findings in Patatoukas (2012).

### 4.2. Results of the baseline analysis

Table 2 presents the results of the baseline analysis on the relation between major customers’ market power and their suppliers’ performance. In columns 1–3, the dependent variable is return on assets (ROA). In column 1, we do not control for customer characteristics or supplier characteristics and the coefficient on major customers’ market power ($EPCM_C$) is significantly positive at the 10% level. In column 2, we control for supplier characteristics and the coefficient on $EPCM_C$ becomes significantly positive at the 5% level. In column 3, we further include customer characteristics and the coefficient on $EPCM_C$ remains significantly positive at the 5% level. Overall, the results support the notion that major customers’ market power benefits their suppliers’ performance.

| VARIABLES | ROA (1) | ROA (2) | ROA (3) | ROA (4) |
|-----------|---------|---------|---------|---------|
| $EPCM_C$  | 0.046*  | 0.043** | 0.053***| 0.131** |
|           | (1.69)  | (1.97)  | (2.26)  | (2.12)  |
| $SIZE$    | 0.018***| 0.018***| 0.035***|         |
|           | (10.20) | (10.06) | (7.06)  |         |
| $LEV$     | −0.106***| −0.106***| −0.173***|         |
|           | (−15.76)| (−15.75)| (−7.36) |         |
| $TOBINQ$  | 0.006***| 0.006***| 0.007   |         |
|           | (4.07)  | (4.07)  | (1.62)  |         |
| $AGE$     | 0.002   | 0.002   | 0.011   |         |
|           | (0.58)  | (0.59)  | (1.20)  |         |
| $LIQUID$  | 0.009   | 0.009   | 0.049*  |         |
|           | (0.94)  | (0.97)  | (1.86)  |         |
| $RET$     | 0.014***| 0.015***| 0.042***|         |
|           | (4.38)  | (4.51)  | (4.98)  |         |
| $SOE$     | −0.011***| −0.011***| −0.024***|         |
|           | (−3.32) | (−3.24) | (−2.79) |         |
| $TOP1$    | 0.053***| 0.053***| 0.148***|         |
|           | (5.24)  | (5.23)  | (5.54)  |         |
| $HHI$     | −0.051  | −0.047  | −0.065  |         |
|           | (−1.15) | (−1.04) | (−0.66) |         |
| $CC$      | −0.024***| −0.023***| −0.066***|         |
|           | (−3.16) | (−3.02) | (−3.62) |         |
| $SIZE_C$  | −0.001  | 0.001   |         |         |
|           | (−1.04) | (0.55)  |         |         |
| $LEV_C$   | 0.011   | 0.023   |         |         |
|           | (1.38)  | (1.12)  |         |         |
| $RET_C$   | −0.006* | −0.009  |         |         |
|           | (−1.65) | (−1.08) |         |         |
| $SC_C$    | 0.004   | 0.022   |         |         |
|           | (0.53)  | (0.98)  |         |         |

This table reports the results of the relation between the customer firm’s product market power and the supplier firm performance. All variables are defined in the Appendix. t-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.
The effect of major customers’ market power on their suppliers’ performance is also economically significant. Given the coefficient of 0.053 on $EPCM\_C$ in column 3, when a major customer’s market power increases by one standard deviation (i.e. 0.074, as shown in Table 1), its supplier’s $ROA$ increases by 0.39% ($= 0.053 \times 0.074$), which is 11.82% ($= 0.39\%/0.033$) of the mean value of $ROA$. In column 4, the dependent variable is return on equity ($ROE$). The coefficient on $EPCM\_C$ is 0.131, which is significant at the 5% level. These results suggest that, when a major customer’s market power increases by one standard deviation, its supplier’s $ROE$ increases by 21.07% ($= 0.131 \times 0.074/0.046$). The results continue to support the notion that major customers’ market power has a positive effect on their suppliers’ performance.

### 4.3. Cross-sectional analyses

In this section, we examine the economic factors influencing the relation between major customers’ market power and their suppliers’ performance. Specifically, we investigate whether the effect of a major customer’s market power on its supplier’s performance varies with the economic bonding between the two firms, their geographic distance, and the maturity of their relationship.

#### 4.3.1. The role of economic bonding between a major customer and its supplier

We posit that a major customer with greater market power can support its supplier’s operations more and thus benefit the supplier’s performance more. If the economic bonding between the major customer and its supplier is weak, however, the customer may have a weak incentive to support its supplier. In addition, when the economic bonding between the two firms is weak, the major customer’s support may be less valuable for its supplier. Therefore, we expect that the positive effect of a major customer’s market power on its supplier’s performance will be less pronounced when the economic bonding between the two firms is weaker.

We construct two measures of the economic bonding between a major customer and its supplier. The first measure, $S-C\; Sales\; Ratio$, is the fraction of the supplier’s total sales that are made to the major customer. The second measure, $C-S\; Purchase\; Ratio$, is the fraction of the major customer’s total purchases that come from the supplier.¹

Table 3 reports the results on the moderating effect of the economic bonding between a major customer and its supplier. In Panel A of Table 3, we divide our sample into two groups based on the median of $S-C\; Sales\; Ratio$ each year, then re-regress Model (1) for each group separately. In columns 1 and 2 we measure a supplier’s performance with $ROA$. Column 1 shows that, for the subsample with higher values of $S-C\; Sales\; Ratio$, the coefficient on $EPCM\_C$ is significantly positive (coefficient = 0.105; $p$-value < 0.01). These results suggest that when the economic bonding between a major customer and its supplier is strong, the customer’s product market power significantly benefits the supplier’s performance. Interestingly, column 2 indicates that for the subsample with lower values of $S-C\; Sales\; Ratio$, the coefficient on $EPCM\_C$ is not significantly different from zero.

¹Because Chinese public firms do not directly disclose their total purchases, we infer a firm’s total purchases as the amount of the firm’s purchases from its top five supplier firms divided by the proportion of the firm’s purchases from those suppliers.
Table 3. Moderating effect of the economic bonding between a major customer and its supplier.

| VARIABLES | Strong Bonding | Weak Bonding | ROA | Weak Bonding | ROA |
|-----------|----------------|--------------|-----|--------------|-----|
|           | (1)            | (2)          | (3) | (4)          |
| Panel A: Sample partitioned by S-C Sales Ratio |
| EPCM_C    | 0.105***       | 0.000        | 0.226*** | 0.004        |
|           | (2.67)         | (0.00)       | (2.40) | (0.06)       |
| SIZE      | 0.019***       | 0.016***     | 0.037*** | 0.029***     |
|           | (6.65)         | (5.65)       | (4.51) | (3.59)       |
| LEV       | −0.109***      | −0.101***    | −0.194*** | −0.139***    |
|           | (−10.85)       | (−10.26)     | (−5.33) | (−4.60)      |
| TOBINQ    | 0.007***       | 0.006***     | 0.010 | 0.006*       |
|           | (2.91)         | (3.26)       | (1.38) | (1.71)       |
| AGE       | −0.002         | 0.009        | 0.001 | 0.026**      |
|           | (−0.24)        | (1.61)       | (0.05) | (1.99)       |
| LIQUID    | 0.006          | 0.015        | 0.009 | 0.093***     |
|           | (0.37)         | (1.06)       | (0.19) | (2.60)       |
| RET       | 0.015***       | 0.012***     | 0.038*** | 0.038***     |
|           | (3.20)         | (2.60)       | (2.71) | (3.70)       |
| SOE       | −0.008         | −0.016***    | −0.019 | −0.040***    |
|           | (−1.54)        | (−3.35)      | (−1.49) | (−3.32)      |
| TOP1      | 0.055***       | 0.048***     | 0.149*** | 0.141***     |
|           | (3.75)         | (3.54)       | (3.49) | (4.28)       |
| HHI       | −0.015         | −0.066       | 0.048 | −0.161       |
|           | (−0.24)        | (−0.98)      | (0.31) | (−1.21)      |
| CC        | −0.026**       | −0.014       | −0.089*** | −0.042       |
|           | (−2.22)        | (−1.04)      | (−3.06) | (−1.31)      |
| SIZE_C    | −0.001         | −0.001       | 0.002 | −0.000       |
|           | (−0.89)        | (−0.62)      | (0.52) | (−0.02)      |
| LEV_C     | 0.041***       | 0.010        | 0.068 | 0.011        |
|           | (2.98)         | (−1.03)      | (1.59) | (−0.48)      |
| RET_C     | −0.002         | −0.006       | −0.003 | −0.005       |
|           | (−0.38)        | (−1.48)      | (−0.21) | (−0.50)      |
| SC_C      | 0.017          | 0.016        | 0.039 | −0.017       |
|           | (1.53)         | (1.43)       | (1.12) | (−0.52)      |
| YEAR/INDUSTRY | YES | YES | YES | YES |
| Observations | 710 | 723 | 710 | 723 |
| Adjusted $R^2$ | 0.432 | 0.394 | 0.320 | 0.263 |
| Diff. test on EPCM_C | 0.009 | 0.025 |

Panel B: Sample partitioned by C-S Purchase Ratio

| VARIABLES | Strong Bonding | Weak Bonding | ROA | Weak Bonding | ROA |
|-----------|----------------|--------------|-----|--------------|-----|
|           | (1)            | (2)          | (3) | (4)          |
| EPCM_C    | 0.086**        | −0.001       | 0.180* | 0.020        |
|           | (2.34)         | (−0.03)      | (1.83) | (0.24)       |
| SIZE      | 0.015***       | 0.019***     | 0.040*** | 0.027***     |
|           | (3.09)         | (5.21)       | (4.59) | (2.66)       |
| LEV       | −0.112***      | −0.107***    | −0.210*** | −0.161***    |
|           | (−10.05)       | (−8.56)      | (−6.07) | (−4.02)      |
| TOBINQ    | 0.007***       | 0.004*       | 0.011* | −0.003       |
|           | (2.75)         | (1.79)       | (1.91) | (−0.48)      |
| AGE       | −0.006         | 0.009        | −0.003 | 0.022        |
|           | (−0.91)        | (1.21)       | (−0.22) | (1.41)       |
| LIQUID    | −0.014         | 0.026        | −0.008 | 0.094**      |
|           | (−0.86)        | (1.59)       | (−0.15) | (2.12)       |
| RET       | 0.024***       | 0.010*       | 0.050*** | 0.051**      |
|           | (4.28)         | (1.90)       | (3.68) | (3.66)       |
| SOE       | −0.006         | −0.016***    | −0.018 | −0.036**     |
|           | (−0.95)        | (−2.98)      | (−1.26) | (−2.58)      |
| TOP1      | 0.042**        | 0.049***     | 0.128*** | 0.141***     |
|           | (2.58)         | (2.83)       | (3.03) | (3.20)       |
| HHI       | 0.097          | −0.093       | 0.149 | −0.184       |
|           | (0.98)         | (−1.39)      | (0.65) | (−1.46)      |
| CC        | −0.031**       | −0.027**     | −0.071** | −0.079**     |
|           | (−2.36)        | (−2.05)      | (−2.27) | (−2.45)      |

(Continued)
Table 3. (Continued).

|     | SIZE_C | LEV_C | RET_C | SC_C | YEAR/ INDUSTRY | Adjusted R² |
|-----|--------|-------|-------|------|----------------|-------------|
|     | 0.001  | 0.015 | −0.007| 0.020| YES            | 0.409       |
|     | (0.28) | (1.31) | (−1.03)| (1.52)| YES            | 0.408       |
|     | 0.001  | 0.016 | −0.008| 0.005| YES            | 0.408       |
|     | (0.29) | (1.15) | (−1.41)| (0.29)| YES            | 0.408       |
|     | 0.002  | 0.013 | −0.013| 0.036| YES            | 0.326       |
|     | (0.32) | (0.39) | (−0.80)| (0.80)| YES            | 0.326       |
|     | 0.002  | 0.035 | −0.008| 0.045| YES            | 0.266       |
|     | (0.49) | (1.18) | (−0.61)| (1.09)| YES            | 0.266       |
| Diff. test on EPCM_C | 0.037 | 0.095 |

This table reports the results of the moderating effect of the economic bonding between a major customer and its supplier. S-C Sales Ratio is the fraction of the supplier’s total sales that are made to the major customer. C-S Purchase Ratio is the fraction of the major customer’s total purchases that come from the supplier. All the other variables are defined in the Appendix. t-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Therefore, we find no evidence that a major customer’s market power is significantly associated with its supplier’s performance when the economic bonding between the two firms is weak. Further analysis shows that the difference between the two coefficients on EPCM_C in the two subsamples is statistically significant at the 1% level. These results support the notion that the impact of major customers’ market power on their suppliers’ performance is more pronounced when the economic bonding between the two firms is stronger.

In columns 3 and 4 of Panel A, we measure a supplier firm’s performance with ROE. The results continue to support the notion that economic bonding between a major customer and its supplier strengthens the effect of the customer’s market power on the supplier’s performance.

In Panel B of Table 3, we partition the sample by the median of C-S Purchase Ratio. The results reported in Panel B are similar to those in Panel A. These results still support the notion that the effect of a major customer’s market power on its supplier’s performance varies with the economic bonding between the two parties.

4.3.2. The role of the geographic distance between a major customer and its supplier

Next, we examine whether the geographic distance between a major customer and its supplier influences the relation between the customer’s market power and the supplier’s performance. Geographical proximity between a major customer and its supplier can promote communication and cooperation between the two firms (Joskow, 1987). Thus, we expect that when a major customer is geographically closer to its supplier, the effect of the customer’s market power on its supplier’s performance is stronger.

Using Chu et al.’s (2017) approach, we construct the variable DISTANCE to measure the geographic distance between a major customer and its supplier. We then divide our sample into two groups based on the yearly median of DISTANCE, and estimate Model (1) with each group. The results of the tests are reported in Table 4 and the dependent variables are ROA (ROE) in columns 1 and 2 (3 and 4). Column 2 shows that, for the subsample of supplier firms proximate to their major customers, the coefficient on EPCM_C is significantly positive (coefficient = 0.078;
p-value < 0.1). In contrast, column 1 reports that, for the subsample of suppliers far away from their major customers, the coefficient on EPCM_C is insignificant. These results are consistent with the notion that the geographic distance between a major customer and its supplier weakens the impact of the customer’s market power on its supplier’s performance. As presented in columns 3 and 4, the findings are similar when we measure a supplier’s performance with ROE.

4.3.3. The role of the customer–supplier relationship maturity
We also examine whether the effect of the major customer’s market power on its supplier’s performance varies with their relationship’s maturity. As the relationship between a major customer and its supplier matures, they trust each other more and cooperate more closely. Consistent with this view, Irvine et al. (2016) find that major customers benefit their suppliers’ performance more when their relationship

Table 4. Moderating effect of the geographic distance between a major customer and its supplier.

| VARIABLES | Long Distance | Short Distance | Long Distance | Short Distance |
|-----------|---------------|----------------|---------------|----------------|
| EPCM_C    | 0.019         | 0.078*         | 0.008         | 0.197**        |
| SIZE      | 0.016***      | 0.019***       | 0.028***      | 0.037***       |
| LEV       | −0.107***     | −0.097***      | −0.196***     | −0.110***      |
| TOBINQ    | 0.003         | 0.008***       | 0.000         | 0.013***       |
| AGE       | 0.003         | 0.004          | 0.005         | 0.013          |
| LIQUID    | −0.000        | 0.036**        | 0.024         | 0.113***       |
| RET       | 0.016***      | 0.011***       | 0.054***      | 0.024***       |
| SOE       | −0.009***     | −0.012***      | −0.024***     | −0.036***      |
| TOP1      | 0.043***      | 0.053***       | 0.147***      | 0.122***       |
| HHI       | −0.116*       | −0.007         | −0.190        | 0.041          |
| CC        | −0.036***     | −0.017         | −0.112***     | −0.021         |
| SIZE_C    | −0.000        | 0.000          | 0.005         | 0.002          |
| LEV_C     | 0.012         | 0.007          | 0.050         | −0.010         |
| RET_C     | −0.011*       | 0.000          | −0.019        | 0.011          |
| SC_C      | 0.007         | 0.008          | 0.009         | 0.040          |
| YEAR/ INDUSTRY | YES | YES | YES | YES |
| Observations | 703 | 712 | 703 | 712 |
| Adjusted R² | 0.413 | 0.411 | 0.312 | 0.288 |

Diff. test on EPCM_C 0.097 0.052

This table reports the results of the moderating effect of the geographic distance between a major customer and its supplier. All variables are defined in the Appendix. t-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.
becomes more mature. Therefore, we expect that the impact of a major customer’s market power on its supplier’s performance will be stronger when their relationship is more mature.

Following Wang and Gao (2017b), we measure the customer–supplier relationship maturity as the number of years for which the firm has been one of the supplier’s top five major customers. For partnerships lasting at least three years, we classify the customer–supplier relationships as mature. We partition the sample into two groups based on whether a supplier firm has a mature relationship with its major customer. The results, reported in Table 5, show that the coefficients on EPCM_C are insignificant for the group without mature customer–supplier relationships (as presented in columns 1 and 3), but the coefficients on EPCM_C are significantly positive for the group with mature customer–supplier relationships (columns 2 and 4). These results lend support to the notion that the effect of a major customer’s market power on its supplier’s performance is more pronounced when their relationship is more mature.

Table 5. Moderating effect of the maturity of the customer–supplier relationship.

| VARIABLES | ROA Early stage | ROA Mature Stage | ROE Early stage | ROE Mature Stage |
|-----------|----------------|-----------------|----------------|-----------------|
| EPCM_C    | 0.038 (1.43)   | 0.128** (2.38)  | 0.091 (1.52)   | 0.232*** (2.62) |
| SIZE      | 0.018*** (8.28) | 0.016*** (4.42) | 0.035*** (6.06) | 0.033*** (5.12) |
| LEV       | −0.106*** (−13.50) | −0.101*** (−8.21) | −0.174*** (−9.73) | −0.164*** (−7.38) |
| TOBINQ    | 0.008*** (4.32) | 0.001 (0.56)    | 0.009*** (2.45) | −0.000 (−0.06)  |
| AGE       | 0.003 (0.63)   | −0.002 (−0.28)  | 0.011 (0.82)   | 0.002 (0.12)    |
| LIQUID    | 0.012 (1.05)   | 0.002 (0.13)    | 0.052* (1.68)  | 0.033 (0.84)    |
| RET       | 0.015*** (3.72) | 0.010* (1.87)   | 0.044*** (4.18) | 0.031*** (2.69) |
| SOE       | −0.009** (−2.20) | −0.012* (−1.73) | −0.025*** (−2.24) | −0.018 (−1.50)  |
| TOP1      | 0.060*** (4.94) | 0.030 (1.53)    | 0.170*** (5.13) | 0.070* (1.90)   |
| HHI       | −0.085* (−1.69) | 0.045 (0.50)    | −0.138 (−0.89) | 0.100 (0.43)    |
| CC        | −0.024*** (−2.59) | −0.021 (−1.33)  | −0.076*** (−3.19) | −0.039 (−1.39)  |
| SIZE_C    | −0.001 (−1.27) | 0.000 (0.20)    | 0.001 (0.33)   | 0.002 (0.62)    |
| RET_C     | 0.008 (0.93)   | 0.024 (1.21)    | 0.019 (0.79)   | 0.019 (0.52)    |
| LEV_C     | −0.008* (−1.83) | −0.003 (−0.33)  | −0.013 (−1.18) | 0.009 (0.61)    |
| SC_C      | −0.003 (−0.36) | 0.025* (1.87)   | 0.007 (0.25)   | 0.055* (1.81)   |
| YEAR/ INDUSTRY | YES | YES | YES | YES |
| Observations | 1016 | 417 | 1016 | 417 |
| Adjusted $R^2$ | 0.405 | 0.372 | 0.255 | 0.346 |

This table reports the results of the moderating effect of the maturity of the customer–supplier relationship. All variables are defined in the Appendix. t-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.
4.4. Robustness tests

4.4.1. Tests to address endogeneity concerns

We conduct two tests to address potential endogeneity problems in our main analysis. In the first test, we use the change regression model to control for time-invariant variables that correlated with both the dependent variable and the variable of interest. Specifically, we regress the change in the dependent variable on the changes in the independent variables. The results, reported in Panel A of Table 6, show that the coefficients on $\Delta EPCM_C$ are significantly positive in all the tests. This suggests that the effect of a major customer’s market power on its supplier’s performance is likely to be causal.

In the second test, we use the simultaneous equation model to address the potential reverse causality problem. Specifically, suppliers with better performance may help their major customers improve their competitiveness, leading to the positive association between major customers’ market power and their suppliers’ performance. To mitigate this concern, we adopt the simultaneous equation model following Y. Wu et al. (2017) and estimate Models (1) and (2) simultaneously.

$$EPCM_C = \alpha_0 + \alpha_1 \text{PERFORM} + \alpha_2 \text{SIZE}_C + \alpha_3 \text{LEV}_C + \alpha_4 \text{TOBINQ}_C + \alpha_5 \text{RET}_C$$
$$+ \alpha_6 \text{SOE}_C + \alpha_7 \text{INDEPCM}_C + \alpha_8 \text{SIZE} + \alpha_9 \text{LEV} + \alpha_{10} \text{RET} + \varepsilon$$ (2)

where $EPCM_C$ is the major customer’s market power and $\text{PERFORM}$ is the supplier’s performance measured with $\text{ROA}$ or $\text{ROE}$. In Model (2) we also control for the major customer’s characteristics, including customer firm size ($\text{SIZE}_C$), net debt ratio ($\text{LEV}_C$), Tobin’s Q ($\text{TOBINQ}_C$), the stock return ($\text{RET}_C$), an indicator variable for state-owned firms ($\text{SOE}_C$), and the Lerner Index for the firm’s industry ($\text{INDEPCM}_C$). We further control for the supplier’s characteristics including supplier firm size ($\text{SIZE}$), net debt ratio ($\text{LEV}$), and stock return ($\text{RET}$). We also control for year and industry fixed effects.

Panel B of Table 6 reports the results of this test. Columns 1 and 2 show that the coefficients on $EPCM_C$ are still significantly positive, confirming that a major customer’s market power has a positive effect on its supplier’s performance. In addition, columns 3 and 4 document that the coefficients on $\text{PERFORM}$ are insignificant. Therefore, we find no evidence that the supplier’s performance benefits its major customer’s market power.

4.4.2. Alternative explanation of customer–supplier matching

An alternative explanation for our findings is that major customers with greater product market power may choose suppliers with better performance to benefit their own development. However, our findings are unlikely to be mainly driven by this matching explanation, for two reasons. First, even if major customers consider performance in selecting their suppliers, they are likely to consider historical performance of the potential suppliers. The change analysis reported in Table 6 Panel A excludes historical performance in constructing the dependent variable, which mitigates the impact of potential customer–supplier matching. Second, the matching explanation implies that suppliers with better performance can benefit their major customers more in improving their market power. However, the results reported in Table 6, Panel B show that suppliers’ performance does not significantly
Table 6. Tests to Address Endogeneity Concerns.

| VARIABLES | ΔROA    | ΔROE    | ΔROA    | ΔROE    |
|-----------|---------|---------|---------|---------|
|           | (1)     | (2)     | (3)     | (4)     |

**Panel A: Tests using the change model**

| VARIABLE  | ΔEPCM_C | ΔSIZE  | ΔLEV   | ΔTOBINQ |
|-----------|---------|--------|--------|---------|
|           | 0.149** | 0.029*** | −0.090*** | 0.003 |
|           | (2.47)  | (2.87) | (−5.06) | (1.53)  |
|           | 0.130** | 0.030*** | −0.090*** | 0.004*  |
|           | (2.06)  | (2.79) | (−4.82) | (1.65)  |
|           | 0.364** | 0.047* | −0.174*** | 0.003 |
|           | (2.35)  | (1.85) | (−3.79) | (0.60)  |
|           | 0.316*  | 0.049* | −0.174*** | 0.004  |
|           | (1.89)  | (1.81) | (−3.58) | (0.71)  |
|           | (Continued) |

| VARIABLE  | ΔLIQUID  |
|-----------|-----------|
|           | −0.082*** |
|           | (−2.71)  |
|           | −0.083*** |
|           | (−2.65)  |
|           | −0.110   |
|           | (−3.33)  |
|           | −0.113   |
|           | (−3.11)  |
|           | (Continued) |

| VARIABLE  | ΔRET    | ΔSIZE  | ΔLEV   | ΔTOBINQ |
|-----------|---------|--------|--------|---------|
|           | 0.005*  | 0.017*** | −0.104*** | 0.003 |
|           | (1.84)  | (1.29) | (−18.72) | (0.20)  |
|           | 0.006** | 0.033*** | −0.167*** | 0.001 |
|           | (2.03)  | (1.78) | (−12.02) | (0.16)  |
|           | 0.013*  | 0.128   | −0.130   |
|           | (1.96)  | (0.93)  | (−0.98)  |
|           | 0.016** | 0.092   | −0.048   |
|           | (2.13)  | (0.66)  | (−0.33)  |
|           | (Continued) |

| VARIABLE  | ΔRET_C   | ΔSIZE_C | ΔLEV_C  | ΔTOBINQ_C |
|-----------|----------|---------|---------|------------|
|           | −0.002   | −0.003  | −0.020  | 0.017      |
|           | (−1.02)  | (−0.20) | (−0.01) | (0.96)     |
|           | −0.005   | 0.001   |
|           | (−0.75)  | (0.07)  |
|           | (Continued) |

| VARIABLE  | ΔSC_C    |
|-----------|----------|
|           | 0.017    |
|           | (0.96)   |
|           | 0.077    |
|           | (1.64)   |

| YEAR | INDUSTRY | Observations | Adjusted R-squared |
|------|----------|--------------|--------------------|
| YES  | YES      | 1156         | 0.130              |
| YES  | YES      | 1052         | 0.146              |
| YES  | YES      | 1156         | 0.063              |
| YES  | YES      | 1052         | 0.075              |

**Panel B: Tests using the simultaneous equation model**

| VARIABLE  | ΔEPCM_C  |
|-----------|----------|
|           | 0.251*** |
|           | (3.15)   |
|           | 0.430**  |
|           | (2.18)   |
|           | ROA      |
|           | 0.002    |
|           | (0.02)   |
|           | 0.043**  |
|           | (1.15)   |
|           | ROE      |
|           | 0.003    |
|           | (0.07)   |
|           | ΔSIZE    |
|           | −0.104***|
|           | (10.08)  |
|           | −0.167***|
|           | (7.77)   |
|           | ΔLEV     |
|           | −0.093***|
|           | (18.72)  |
|           | −0.093***|
|           | (12.02)  |
|           | ΔTOBINQ  |
|           | −0.093***|
|           | (4.85)   |
|           | −0.093***|
|           | (2.51)   |
|           | ΔAGE     |
|           | −0.093***|
|           | (0.87)   |
|           | −0.093***|
|           | (1.15)   |
|           | ΔLIQUID  |
|           | −0.093***|
|           | (0.95)   |
|           | −0.093***|
|           | (1.91)   |
|           | ΔRET     |
|           | −0.093***|
|           | (80.40)  |
|           | −0.093***|
|           | (5.18)   |
|           | ΔSOE     |
|           | −0.093***|
|           | (5.52)   |
|           | −0.093***|
|           | (5.93)   |
|           | ΔTOP1    |
|           | −0.093***|
|           | (−3.67)  |
|           | −0.093***|
|           | (−3.00)  |
|           | ΔHHI     |
|           | −0.093***|
|           | (−0.58)  |
|           | −0.093***|
|           | (−0.30)  |
|           | ΔCC      |
|           | −0.093***|
|           | (−2.92)  |
|           | −0.093***|
|           | (−2.43)  |
|           | ΔRET_C   |
|           | −0.093***|
|           | (−2.97)  |
|           | −0.093***|
|           | (−2.47)  |
|           | ΔRET_C   |
|           | −0.093***|
|           | (−2.97)  |
|           | −0.093***|
|           | (−2.47)  |
|           | ΔRET_C   |
|           | −0.093***|
|           | (−2.97)  |
|           | −0.093***|
|           | (−2.47)  |
|           | ΔRET_C   |
|           | −0.093***|
|           | (−2.97)  |
|           | −0.093***|
|           | (−2.47)  |
|           | ΔRET_C   |
|           | (Continued) |

| VARIABLE  | ΔROA    | ΔROE    | ΔROA    | ΔROE    |
|-----------|---------|---------|---------|---------|
|           | (1)     | (2)     | (3)     | (4)     |

(Continued)
benefit their major customers’ market power, which does not support the implication of the matching explanation. Therefore, our findings are unlikely to mainly result from customer–supplier matching.

### 4.4.3. Alternative measures of major customers’ market power

To assess the robustness of our main findings, we use two alternative measures of major customers’ market power. First, following Y. Wu et al. (2017), we use principal components to construct a composite market power measure \((EPCM_C2)\) from several market power measures. These measures are a firm’s abnormal market share, abnormal gross margin, abnormal operating cash flow, abnormal return on assets, and abnormal sales growth. Second, following Zhou and Zhou (2014), we use the industry adjusted gross margin \((EPCM_C3)\) as an alternative measure of a firm’s market power. Our findings (untabulated) are robust to these alternative measures of major customers’ market power.

### 5. Additional tests

In this section, we conduct additional tests to shed light on the channels through which major customers’ market power influences their suppliers’ performance. First, we investigate the relation between a major customer’s market power and the stability of its demand. We reason that the product market power of a major customer facilitates its supplier’s operations and investments because the demand from the customer is more stable. Therefore, we examine whether major customers with greater market power have more stable demand.

Following D. A. Cohen and Li (2020), we measure the stability of a major customer’s demand \((\text{DEMAND STABILITY})\) as the standard deviation of the changes in the log value of the supplier’s sales \((\Delta \ln \text{SALE})\) over the prior three years. A smaller value of \(\text{DEMAND STABILITY}\) indicates more stable demand from a major customer. Table 7 reports the results of the analysis on the relation between major customers’ market power and the stability of their demand. The coefficients on
**Table 7.** Major customers’ market power and the stability of their demand.

| VARIABLES  | DEMAND STABILITY |
|------------|------------------|
|            | (1)              | (2)              |
| EPCM_C     | −0.467**         | −0.441**         |
|            | (−2.33)          | (−2.12)          |
| SIZE       | 0.013            | 0.017            |
|            | (1.19)           | (1.62)           |
| LEV        | 0.104**          | 0.103**          |
|            | (2.29)           | (2.27)           |
| TOBINQ     | 0.016            | 0.017*           |
|            | (1.55)           | (1.67)           |
| AGE        | 0.146***         | 0.143***         |
|            | (4.78)           | (4.69)           |
| LIQUID     | −0.007           | −0.001           |
|            | (−0.09)          | (−0.01)          |
| RET        | −0.039*          | −0.040*          |
|            | (−1.78)          | (−1.87)          |
| SOE        | −0.091***        | −0.093***        |
|            | (−3.59)          | (−3.62)          |
| TOP1       | 0.287***         | 0.297***         |
|            | (2.81)           | (2.94)           |
| HHI        | −0.355           | −0.357           |
|            | (−1.09)          | (−1.08)          |
| CC         | 0.161***         | 0.176***         |
|            | (2.85)           | (3.14)           |
| SIZE_C     | −0.013**         |                   |
|            | (−2.45)          |                   |
| LEV_C      | 0.024            |                   |
|            | (0.50)           |                   |
| RET_C      | −0.024           |                   |
|            | (−0.90)          |                   |
| SC_C       | −0.071*          |                   |
|            | (−1.67)          |                   |
| YEAR/ INDUSTRY | YES          | YES              |
| Observations | 1123          | 1123              |
| Adjusted R-squared | 0.111     | 0.115             |

This table reports the results of tests on the relation between major customers’ market power and the stability of their demand. DEMAND STABILITY is the standard deviation of the changes in the log value of the supplier’s sales over the prior three years. All the other variables are defined in the Appendix. t-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

**EPCM_C** are significantly negative at the 5% level, supporting the notion that major customers with greater product market power exhibit more stable demand.

Second, we examine whether the market power of major customers reduces their suppliers’ cost of debt. We argue that the reputation of major customers with strong market power provide certification on the value of their suppliers and thus reduces the suppliers’ cost of debt. To assess the validity of this argument, we investigate whether a supplier’s cost of debt is lower when its major customer has stronger market power.

Following Pittman and Fortin (2004), we measure a firm’s cost of debt (DEBT_COST) as the interest expenses for a given year divided by the average value of the total debt at the end of the year and at the beginning of the year. Total debt is calculated as the sum of short-term loans, long-term loans, long-term...
Table 8. Major customers’ market power and the cost of debt of their suppliers.

| VARIABLES  | (1)       | (2)       |
|------------|-----------|-----------|
| DEBTCOST   | DEBTCOST  | DEBTCOST  |
|            | (1)       | (2)       |
| EPCM_C     | −0.046**  | −0.057**  |
|            | (−2.02)   | (−2.46)   |
| SIZE       | −0.004**  | −0.003**  |
|            | (−2.20)   | (−2.03)   |
| LEV        | 0.009     | 0.009     |
|            | (1.18)    | (1.12)    |
| TOBINQ     | 0.002     | 0.002     |
|            | (1.34)    | (1.35)    |
| AGE        | 0.004     | 0.003     |
|            | (0.86)    | (0.67)    |
| LIQUID     | 0.004     | 0.005     |
|            | (0.36)    | (0.43)    |
| RET        | −0.001    | −0.002    |
|            | (−0.32)   | (−0.53)   |
| SOE        | −0.003    | −0.003    |
|            | (−0.80)   | (−0.86)   |
| TOP1       | −0.030*** | −0.029*** |
|            | (−3.00)   | (−2.86)   |
| HHI        | −0.100    | −0.104    |
|            | (−1.50)   | (−1.59)   |
| CC         | −0.002    | −0.001    |
|            | (−0.25)   | (−0.09)   |
| SIZE_C     | −0.001    | −0.014    |
|            | (−0.78)   | (−1.33)   |
| LEV_C      | −0.014    | (0.004    |
|            | (0.73)    | (1.73)    |
| RET_C      | 0.015*    | (1.73)    |
| SC_C       | 0.015*    | (1.73)    |
| YEAR/INDUSTRY | YES   | YES   |
| Observations | 1229   | 1229   |
| Adjusted R-squared | 0.053 | 0.058 |

This table reports the results of the tests on the relation between major customers’ market power and the cost of debt of their suppliers. DEBTCOST is the interest expenses for a given year divided by the average value of the total debt at the end of the year and at the beginning of the year. All the other variables are defined in the Appendix. t-statistics are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

debt maturing within one year, and bonds payable. Table 8 reports the results of the analysis on the relation between major customers’ market power and their suppliers’ cost of debt. Columns 1 and 2 show that the coefficients on EPCM_C are significantly negative at the 5% level, which is consistent with the notion that the market power of major customers reduces the cost of debt of their suppliers.

Third, we investigate whether the market power of major customers helps their suppliers improve investment efficiency. We reason that major customers with strong market power are more likely to share their information and resources with suppliers and thus can benefit the efficiency of their suppliers’ investments. To evaluate the validity of this reasoning, we examine the relation between major customers’ market power and their suppliers’ investment efficiency. We construct
our measure of investment efficiency (INVEFF) following Richardson (2006). The results, reported in Table 9, show that the coefficients on EPCM_C are significantly negative at the 10% level. These results support the notion that the market power of major customers helps improve their suppliers’ investment efficiency.

6. Conclusion

Major customers are important stakeholders of a firm and can significantly influence the firm’s performance. However, there is limited empirical evidence about how major customer features affect their suppliers’ performance. To address this gap in the literature, we examine the effect of major customers’ market power on their suppliers’ performance. We find that
major customers’ market power benefits their suppliers’ performance. Furthermore, the impact of a major customer’s market power on its supplier’s performance varies with their economic bonding, geographic distance, and relationship maturity. In addition, supporting our rationale why major customers’ market power influences their suppliers’ performance, we show that major customers with greater market power have more stable demand and that their suppliers exhibit lower cost of debt and higher investment efficiency.

Our study is the first to explore the role of major customers’ market power in their suppliers’ performance. In addition, we provide evidence on the economic factors shaping the impact of major customers’ market power on their suppliers’ performance. Furthermore, this study shed lights on the channels of the market power effect. Therefore, this study contributes to both the literature on firm performance and the literature on customer-supplier relationships.

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No potential conflict of interest was reported by the author(s).

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### Variable definitions

| Variables | Variables for Supplier Firms Characteristics |
|-----------|---------------------------------------------|
| ROA       | Return on total assets, which is calculated as net income before extraordinary items, scaled by the average value of total assets at the beginning and at the end of the fiscal year |
| ROE       | Return on equity, which is calculated as net income before extraordinary items, scaled by the equity averaged across the beginning and the end of the fiscal year |
| SIZE      | Firm size, which is calculated as the log of the book value of total assets at the end of the fiscal year |
| LEV       | Leverage, which is calculated as total debt minus cash holdings and scaled by total assets |
| LIQUID    | Current asset ratio, calculated as current assets divided by total assets |
| RET       | Stock return, calculated as yearly stock return with cash dividend reinvested |
| TOBINQ    | Tobin’s Q, which is calculated as the market value of the equity plus the book value of total debt, divided by the book value of total assets |
| AGE       | Firm age, which is the log of one plus the number of the years since the firm went public |
| CC        | Customer concentration, which is calculated as the sales to the top five customers divided by the total sales of the supplier |
| HHI       | Herfindahl index of the firm’s industry, which is calculated as the sum of the squares of the sale ratios of all the firms in the industry |
| SOE       | A dummy variable, which is equal to one for state-owned firms and zero for other firms |
| TOP1      | Shareholding of the largest shareholder |

#### Variables for Customer Firm Characteristics

- **EPCM_C**: the industry-adjusted Lerner Index of the major customer firm in the fiscal year
- **SIZE_C**: Firm size of the major customer firm at the end of the fiscal year
- **LEV_C**: Leverage of the major customer firm at the end of the fiscal year
- **RET_C**: Stock return of the major customer firm in the fiscal year
- **SC_C**: Supplier concentration of the major customer firm, which is calculated as the procurement from its top five suppliers divided by the total procurement