Whether Industrial Clusters Can Improve Trade Credit Bargain Power of Enterprises to State-owned Customers?

2021, Vol.2 No.3
© Economics & Management Review 2021
DOI: 10.37420/j.emr.2021.013
https://masonpublish.org

Rensi Li*
School of Accounting, Tianjin University of Commerce, Tianjin, China
***Corresponding author, e-mail: pjlirensi@126.com**

Abstract

It is common for state-owned customers to delay payment and occupy capital flow of upstream enterprises excessively, which will damage the sustainable operation ability of upstream enterprises, then affect the healthy development of whole supply chain, but the enterprises in industrial clusters are in similar industries and adjacent regions, it is easier to realize cooperation and collaboration. Therefore, it is necessary to discuss whether industrial clusters can improve the trade credit bargain power of enterprises to state-owned customers. This research found that the disadvantage of state-owned property rights will reduce the enterprise's trade credit bargain power, but if the industrial linkage or the proportion of same industries between enterprises and customers are higher, or they are in different cities but the distances between cities are closer, enterprises' bargain power will improve, and the state-owned customers' trade credit encroachment on enterprises will decrease. Private enterprises should consider establishing regional or industrial alliances to alleviate the encroachment of trade credit due to the inferior property rights, and promote the establishment of industrial clusters and modern supply chains.

Keywords

Customer Relationship; Industrial Clusters; State-owned Property Right; Trade Credit Bargain Power

Introduction and Literature Review

It is common for state-owned customers delaying the payment of private enterprises. For example, when local governments and state-owned enterprises ask private enterprises to provide products, services or operate projects, they will use their own advantages to delay the payment or even reduce the payment amount, but private enterprises' financial constraints will be more serious because they have limited financing channels. We based on China's A-share listed companies, and find that when enterprises' important customers are all private enterprises, the average turnover period of accounts receivable is 65 days, but when they have state-owned customers, the turnover period of accounts receivable reaches to 112 days, and 10% of the companies

even reach to more than 225 days. Customers' delaying in payment will affect the enterprises' cash flow, and the sustainable operation abilities, enterprises may be unable to purchase goods and pay salary to staff, debt may transfer to the upstream suppliers further, leading to a shortage of funds throughout the supply chain, for example, because of the break of the capital chain of Letv Network Company, the triangular debts generated by the transfer of trade credit reached as high as ￥5 billion, making the upstream and downstream enterprises of Letv face huge losses and even tend to go bankrupt. Therefore, it is very important to reduce the trade credit encroachment from the state-owned customers to the private enterprises, which can achieve healthy development of the whole supply chain.

China's private economic symposium mentioned that we should attach great importance to the problem of triangle debts, and correct the behavior of some government departments and large state-owned enterprises that take advantage of their powerful position to delay payments to private enterprises. The Fourth Plenary Session of the 19th Central Committee also emphasized the requirements to promote national governance systems and capacity, support the development of non-public sector of economy, and reduce the encroachment of private enterprises' interests, the promotion of capital synergy between private enterprises and state-owned enterprises should also be an important aspect of state governance. The establishment of modern supply chain and the realization of coordination among supply chain enterprises are important contents in the report of the 19th National Congress of China's Communist Party. Supply chain enterprises should treat resource integration as the methods, quality and efficiency improvement as the goal, reduce costs and promote innovation development, improve the overall efficiency of supply chain to achieve the goal of supply-side reform. Each enterprise in the supply chain is a single individual, and there will be conflicts of interests among them. As the key of enterprise operation, capital flow is the basis of the supply chain to achieve innovation synergy, improve the efficiency of logistics and realize the goal of information sharing. Trade credit is an important way of enterprises' capital settlements, enterprises will allow customers to delay payment in order to promote sales and transmit quality signals. However, some enterprises' funds will be affected by customers' excessive use of trade credit, which will affect their ability to continuous operations, for example, Geely asks suppliers to comply with the requirements of deferred payment in the settlement, and requests a reduction of the purchase price in order to ensure that its research and development funds are sufficient, Walmart, Carrefour and other big supermarkets also use deferred payments to squeeze suppliers' liquidity for at least two months without paying interests, and this trade credit encroachment will be detrimental to the cooperative development of upstream and downstream enterprises.

We found that both sides of supply chain may offer and use trade credit on the basis of cooperation and coordination, or occupy more trade credit on the basis of competition. From the perspective of collaboration, the suppliers provide trade credit based on the motivations of trade credit price discrimination (Smith, 1987), identifying client risks (Goto et al., 2015), promoting sales (Dass et al., 2015), delivering signals (Jiang & Zeng, 2013), coordinating supply chain (Wang & Wang, 2017), reducing the economic uncertainty (Chen & Liu, 2018), promoting the relationship (Zhang & Li, 2019) and other factors. From the perspective of competition, the supply and demand of trade credit are affected by the negotiation abilities of both parties, the enterprise with more negotiating power will get more trade credit financing, such as enterprises with high industry competitiveness (Barrot,2016), low degree of dependence on another party (Li &Liu, 2016), high product uniqueness (Xiao & Liu, 2017), large size (Klapper et al., 2012), high market position (Giannetti et al., 2011) and so on.

To sum up, there are a lot of studies on the factors influencing the negotiation abilities of trade credit, but there are few studies on the negotiation abilities of trade credit between state-owned clients and private enterprises from the perspective of different state-owned property rights, the problems about how to reduce the state-owned customers encroaching the upstream private enterprises' trade credit have not been fully discussed in academic. We study how the differences of state-owned property rights between enterprises and customers influence the trade credit negotiation abilities, and put forward the corresponding measures from the aspects of industry linkage and regional cluster, the fifth meeting of Central Financial and Economic Commission in August 2019 also emphasized that we should promote the development of regional economies with complementary advantages and high-quality development. We find that the inferior position of the enterprises to the state-owned customers will reduce the enterprises' negotiation abilities, but when enterprises and customers are in similar industries or same industry, in different cities but close to each other, the negotiation disadvantage of enterprises will reduce. The contributions of this paper are as followed: (1) we study the factors influencing trade credit negotiation abilities from the perspective of state-owned property right differences, which enriches the research of customer relationship and trade credit; (2) we put forward some countermeasures to alleviate the problem of state-owned clients' encroachment on private enterprises' trade credit from the perspective of industrial cluster, including two aspects of industry and region, which enriches the research of trade credit from the perspective of cooperation and synergy, and we provide guidances for Chinese enterprises to manage the state-owned customer relationship better, promote the cooperation of trade credit, and provide references for the governments to cultivate industrial clusters, plan industrial regions and establish modern supply chain.

The structure of this paper is as followed: the first part is introduction and literature review, the second part is theoretical analysis and research hypothesis, the third part is research design, sample selection and descriptive statistics, and the fourth part is empirical results, the fifth part is the research conclusions and recommendations.

Theoretical Analysis and Research Hypotheses

The Influence of State-owned Property Right Differences between Enterprises and Customers on the Negotiation Ability of Trade Credit

According to the theory of resource dependence, the main factor affecting the bargaining power is the resource asymmetry between two parties. A firm can gain control over other firms in the supply chain by possessing scarce tangible or intangible resources (Dahl, 1957), and use these resources to influence the strategies of other enterprises. In transactions between enterprises and customers, the negotiation of trade credit between the two parties is dominated by competitive factors, and the power asymmetry between the parties will influence the outcome of negotiation (Gulati & Sytch, 2007), the advantage party with key resources will control the weak party, and take opportunistic behavior to maintain its power and position, the weak party has to accept the demands passively due to the power advantage of the other party (Wu & Choi, 2005). For example, buyers with higher market position may obtain more favorable trade credit financing terms, and enterprises may offer more favorable discount terms to induce customers to pay in advance (Giannetti et al.,2011). Companies in weaker positions or smaller size will give the customers longer credit period (Fabbri & Klap-

per, 2016), at this time small companies will provide trade credit to the customers as the guarantee of product quality (Klapper et al., 2012), and enterprises with high bargaining power are more reluctant to special assets investment, and will reduce the trade credit financing provided to clients (Dass et al., 2015).

State-owned property rights can be used as competitive resources to enhance the negotiation abilities of enterprises. State-owned enterprises are more likely to have access to bank loans (Pan, 2008), get government subsidies (Kong et al., 2013), and are less likely to go bankrupt backed by the state' credibility, as a result, companies are more willing to sell products to state-owned enterprises. At the same time, state-owned enterprises can get state monopoly resources (Jin, 2010), occupy larger market share, subject to state policy preferences, and these resources and technology will play spillover effects through the supply chain (Li et al., 2017), for example, state-owned customers may provide knowledge and technical support to enterprises to ensure their products meet technical and quality requirements, or state-owned enterprises may act as a brand effect, selling products to state-owned customers may make other consumers create associations between the company and the state-owned customers in their minds, creating a "halo effect" in which the company can benefit from the "halo effect" (Li, 2017). Therefore, enterprises have the motivations to maintain long-term contact with state-owned clients. According to the theory of resource dependence, the more dependent party has weaker bargain power. In addition, the state-owned customers have the support of the government, which has enforcement power and monopoly on some resources, private enterprises need to compromise with the state-owned customers to avoid the loss of operating resources.

To sum up, according to the theory of resource dependence, state-owned property rights can obtain more loans, government resources and information, and the state-owned party has stronger bargaining power, but the most important factor affecting the bargaining power is the differences of property rights, the state-owned enterprises are less invaded by the trade credit of state-owned clients compared to the private enterprises, so we propose hypothesis 1:

> Hypothesis 1: The weaker of enterprises' state-owned property rights relative to customers, the weaker the enterprise's trade credit negotiation ability

The influence of property right differences on trade credit negotiation ability under different industry linkages

In similar industries, technology spillovers can occur, including knowledge spillovers, market spillovers and industry-related spillovers, there are more frequent flows of innovative products, ideas and methods, knowledge and people between similar industries, the upstream and downstream enterprises can improve their innovation level through active learning or passive learning in product trading, to meet the development of enterprises in closely related industry, and the higher industry similarity, the higher level of technology spillover (Pan et al., 2011). Even if the distance is far, upstream and downstream enterprises with industry linkage can still realize knowledge spillover through trading, not influenced by geographic distance (Lu et al., 2011), industries with close technological proximity can gain technological spillovers quickly from other industries through absorption effects, driving industry development (Sun et al., 2015), technology will influence the productivity of the other parties through spillovers in the supply chain (Han et al., 2011). As a result, incentives

for collaboration and synergy between enterprises increase in order to facilitate the transfer of people, knowledge and technology up and down the supply chain. In order to ensure the flows of knowledge and technology in the industry to obtain more spillover effects, the state-owned clients will reduce trade credit occupation of upstream enterprises in similar industry.

In addition, according to the theory of industrial linkage, the enterprises with high industrial linkage have more frequent product transactions, higher interdependence, and more inclined to cooperate to ensure the stability of transactions and improve the competitiveness of supply chain in the industry. Bao et al. (2015) found that foreign-funded enterprises purchase and sale products in local markets will promote the development of other industries with high relevance. Wang & Sun (2017) also found that the growth of an industry will be affected by the growth of other industries with highly correlation, and that there are differences in the impacts of forward-linking and backward-linking industries. In order to guarantee the stability of purchasing transactions, the state-owned customers will reduce their bargaining power and make timely payment to the upstream enterprises with high industry linkage.

To sum up, according to the theory of knowledge spillover and industry linkage, it is more convenient for knowledge, technology and people to transfer between enterprises with high industry linkage, and the input and output of enterprises in high relevant industries are more close, the degree of transaction interdependence is higher, the willingness of cooperation and coordination is stronger. Even if the enterprise has the disadvantage of state-owned property rights, the state-owned clients with high industry linkage with the enterprise will reduce their encroachment on the interests of the enterprise, they will pay timely in order to avoid transaction interruption due to insufficient cash flow, enterprise will decrease credit sales, trade credit bargaining power increases, we propose Hypothesis 2:

> Hypothesis 2: The greater association between enterprises and customers' industries, the smaller the negative impact of state-owned property right disadvantage on trade credit negotiation ability

The Influence of Property Right Differences on Trade Credit Negotiation Ability under Different Regional Clusters

First of all, regional clusters of enterprises and customers can promote knowledge flow, enhance resource and risk sharing, and enhance cooperation and synergy between enterprises and customers. In order to exert scale effect and knowledge spillover effect between upstream and downstream enterprises, reduce transaction costs, the enterprises will cluster in geographical distance, and the relationships between the two sides will strengthen (Wang et al., 2018). The knowledge and information transfer better in the region, the cluster can spill over technology, share labor market, and promote the development of regional economy, enterprises' transactions are more convenient in the cluster due to the close geographical distance, and are conducive to synergy (Humphrey & Schmitz, 2002), at the same time they will get external economics because of similar geography, cognition, and institutions (Boschma, 2005). Regional clusters can enhance public resource and share risk, improve the matching quality of labor and enterprises, improve learning and knowledge spillover effects, and promote economic development (Yuan, 2016). Regional clusters can promote the cooperation between enterprises and customers, so customers with close geographical distances can reduce trade credit

invasion on enterprises.

Secondly, regional clustering can reduce information asymmetry. Tang and Li (2019) found that the closer geographical distances between customers and the upstream enterprises, the more the customers can inspect the enterprises' production and governance situation, the more customers can communicate with the enterprises' managers, and have more channels to obtain the enterprises' information, promoting the supervision of enterprises better, and also makes the enterprises' managers understand the customers' requirements better. Trade credit is also a way to monitor the quality of products for customers, when customers do not trust the quality of enterprises' products, customers will demand longer payment periods and trial periods (Kling et al., 2014), regional clusters enable customers to have a more in-depth supervision of the upstream enterprises, which can replace the supervision role of trade credit, customers' payment period will reduce.

To sum up, according to the theory of industrial cluster, enterprises in transaction relationships aggregate in the same area help to obtain external economies of scale, improve knowledge spillover effect, and reduce the transaction cost of space, both sides have more incentive to achieve synergy, state-owned clients have more incentive to cooperate with enterprises and make timely payments in order to promote knowledge exchange as well as other external resources, which will avoid the break of the alliance relationship, and reduce the private enterprises' trade credit encroachment. At the same time, regional clusters can help state-owned customers improve supervision on enterprises, reduce information asymmetry, replace the supervisory role of trade credit, reduce the trial period and payment period of state-owned customers, so we proposes hypothesis 3:

> Hypothesis 3: The closer the geographical distance between the enterprises and the customers, the weaker the negative influence of the state-owned inferior position on the trade credit negotiation ability.

Research Design, Sample Selection and Descriptive Statistics

Research Design

1. Explained Variable

The explained variable is the trade credit in transactions between enterprises and customers, which is measured by net accounts receivable and accounts receivable respectively, and it is standardized by division of operating income.

2. Explanatory Variables

We measure the characteristics of customer following Patatoukas (2012), we use model (1)(2) to measure state-owned property right, industry linkage and regional cluster of customers, $C_Variables_{it}$ represents the comprehensive customer's characteristics of the i company in the t year and is calculated by weighted number, J represents the number of customers' names enterprises disclosed specifically, w_{ijt} represents the proportion of each customer's sale in the total disclosed customers' sales, $C_Variables_{ijt}$ represents the characteristic of disclosed customer. Because China's listed companies only disclosed the top five customers' names in an-

nual reports, so J is 5.

$$C_Variables_{it} = \sum_{j=1}^{J} w_{ijt} \times C_Variables_{ijt} \tag{1}$$

$$w_{ijt} = \left(\frac{Sales_{ijt}}{Sales_{it}} \right) \Big/ \left(\sum_{j=1}^{J} \frac{Sales_{ijt}}{Sales_{it}} \right) \tag{2}$$

(1) The nature of customer's property right. We search for the ultimate controller of the customer, when the ultimate controller is a state-owned enterprise or institution, we set the value of customer's property right as 1, when the ultimate controller is a non-state-owned enterprise, foreign-funded unit or person, we set the value of customer's property right as 0. We calculate the weighted average of the top five customers' property right, and the weight is the proportion of each customer's sales in the top five customers' sales.

(2) Difference of state-owned property rights. We calculate the index using customers' state-owned property right minus enterprises' state-owned property right. The larger the index is, the enterprises' state-owned property resource is more inferior than customers'.

(3) Industry linkage of customer and enterprise. Following Pan (2011), we use input-output table to estimate and set model (3) to calculate industry similarity. We define the industry linkage between I and J as the angular cosine of the direct consumption coefficient structure vector of the two industries. a_{ki} and a_{kj} are the elements of the k-th position of the direct consumption coefficient structure column vector of the i-th industry and the j-th industry respectively. The sample of this paper is from 2007 to 2018. At present, the input and output tables of 135 sub-sectors are only available in 2007 and 2012, we replace the 2008~2011 data with 2007 data, and replace the 2013~2018 data with 2012 data. We match the industry code of input-output table with listed companies' industry code, the industry code is a three-digit industry code. Finally, we calculate the weighted average of the top five customers and companies' industry linkage.

$$Indlink_{ij} = \frac{\sum_{k} a_{ki} a_{kj}}{\sqrt{\sum_{k} a_{ki}^2 \cdot \sum_{k} a_{kj}^2}} \tag{3}$$

(4) Ratio of customers and companies in the same industry. When the customers and the enterprise are in the same industry, we set the variable of same industry is 1, otherwise 0, and the industry code is calculated by two methods: ① using the three-digit industry code, ② following common practices in literatures, we take the first industry code in non-manufacturing industry, and take the first two industry code in manufacturing industry. Finally, we calculate weighted mean value of the top five customers.

(5) The neighboring situation between the customers' and the enterprises' provinces (cities). We use the following three ways to define the province (city) adjacent situation between each customer and the enterprise: ① When the enterprise is adjacent to the border of the province (city) where the customer is located, we set the value 1, otherwise 0; ② When the enterprise is adjacent to the apex of the province (city) where the customer is located, we set the value 1, otherwise 0; ③ Multiply the reciprocal of the province (city) distance between the enterprise and the customer by provincial (city) border adjacent dummy variable. Finally, we cal-

culated the weighted average of the neighboring situations of the top five customers and the enterprise.

(6) Ratio of customers and enterprises in same provinces (cities). When the customers and the enterprises are in same provinces (cities), we set the value of dummy variable 1, otherwise 0. Finally, we calculate the weighted average of the variables of the top five customers and the enterprises in the same province (city).

3. Control Variables

In order to control the influences of other factors on trade credit, we use supplier concentration, customer concentration, firm size, the proportion of largest shareholder, corporate profitability, short-term bank debt, firm age, the proportion of cash holdings, inventory turnover, revenue growth rate as control variables, we also control year dummy variables and industry dummy variables in the model.

Table 1. Variable Definition

Explained variable	Trade credit	*TC*	(accounts receivable- deposit received) / operating income
		AR	Accounts Receivable / operating income
Explanatory variables	customers' property rights	*SOE_C*	Weighted mean of top five customers' state-owned property dummy variables
	enterprises' property rights	*SOE*	State-owned enterprises take 1, non-state-owned enterprises take 0
	State-owned property right differences	△ *SOE*	customers' property rights minus enterprises' property rights
	Customer and Enterprise's Industry Linkage	*Indlink_C*	Weighted average of the top five customers and the enterprises' industry linkage
	Ratio of customers and companies in the same industry	*Indsame_C*	The weighted average of the dummy variables of the top five customers and companies in the same industry, the industry code is calculated by two methods: ① using the three-digit industry code, ② we take the first industry code in non-manufacturing industry, and take the first two industry code in manufacturing industry.
	The neighboring situation between the customers' and the enterprises' provinces (cities)	*Sheng_near* *Shi_near*	The weighted average of the top five customers adjacent to the province (city) where the enterprise is located, the neighboring provinces (cities) have the following measurement methods: ① When the enterprise is adjacent to the border of the province (city) where the customer is located, we set the value 1, otherwise 0; ② When the enterprise is adjacent to the apex of the province (city) where the customer is located, we set the value 1, otherwise 0; ③ Multiply the reciprocal of the province (city) distance between the enterprise and the customer by provincial (city) border adjacent dummy variable.

	Proportion of customers and enterprises in the same province	*Shengsame_C*	The weighted average of the dummy variables of the top five customers and companies in the same provinces
	Proportion of customers and enterprises in the same city	*Shisame_C*	The weighted average of the dummy variables of the top five customers and companies in the same cities
Control variables	Supplier concentration	*Supplier*	The proportion of the purchase amount of the top five suppliers in the total purchase amount
	Customer concentration	*Customer*	The proportion of the sales amount of the top five customers in the total sales amount
	Firm size	*Size*	The natural log of the total assets at the end of period
	Shareholding ratio of the largest shareholder	*Largest*	Number of shares held by the largest shareholder/total number of shares
	Corporate profitability	*ROA*	Net profit/total assets
	Short-term bank debt	*ShortDebt*	Short-term bank debt /operating income
	Firm age	*Firmage*	The natural log of the company's age
	Cash holding ratio	*Cash*	Monetary capital/total assets
	Inventory turnover	*Turnover*	operating income/ average inventory in the year
	Income growth rate	*Growth*	Growth rate of sales revenue
	Year	*Year*	Year dummy variable
	industry	*Ind*	Industry dummy variable

4. Research Models

In order to test hypothesis 1, we set up model (4). If b_1 is significantly positive, the hypothesis 1 is true.

$$TC = b_0 + b_1 \Delta SOE + Controls + IND + Year + \varepsilon \quad (4)$$

In order to test hypothesis 2, we set up model (5)(6), if c_3 is significantly negative, it indicates that state-owned customers in the same industry or with a high degree of industry linkage will reduce the encroachment on the enterprise's trade credit, and the enterprise's negotiation ability will be improved. The hypothesis 2 is true.

$$TC = c_0 + c_1 \Delta SOE + c_2 Indlink_C + c_3 \Delta SOE \times Indlink_C + Controls + IND + Year + \varepsilon \quad (5)$$

$$TC = c_0 + c_1 \Delta SOE + c_2 Indsame_C + c_3 \Delta SOE \times Indsame_C + Controls + IND + Year + \varepsilon \quad (6)$$

In order to test hypothesis 3, we set up model (7)(8). If r_3 and r_5 are significantly negative, it indicates that the closer the provinces of customer and enterprise are, and the larger the proportion of the customers and the enterprise in the same province, the smaller the negative impact of the weakness of state-owned property right on the trade credit negotiation ability of the enterprise. If h_3 and h_5 are significantly negative, it means the closer the cities where customers and enterprises located, and the larger the proportion of customers and the enterprises in same city, the smaller the negative impact of the weakness of state-owned property right on the trade credit negotiation ability of the enterprise.

Source of Sample

The sample of this paper is China's A-share listed companies from the year of 2007 to 2018. The financial and governance data comes from CSMAR database, while the data of property rights, industries and regions are collected manually from the National Enterprise Credit Information Public System and Tianyancha websites based on the top five clients' names disclosed in the annual report of listed companies. Following previous literatures, this paper deals with the data as follows: (1) deleting the financial industry data; (2) deleting sample of ST companies; (3) deleting missing values in the main regression, and winsor all variables at the 1st and 99th percentile to reduce the bias of outliers to the results, leaving 18,735 samples, because many enterprises did not disclose the specific names of their customers, therefore, we cannot determine the property right, industry and regional characteristics, and the missing values will be deleted in relevant regression analysis.

$$TC = r_0 + r_1 \Delta SOE + r_2 Sheng_near + r_3 \Delta SOE \times Sheng_near + r_4 Shengsame_C + r_5 \Delta SOE \times Shengsame_C + Controls + IND + Year + \varepsilon \quad (7)$$

$$TC = h_0 + h_1 \Delta SOE + h_2 Shi_near + h_3 \Delta SOE \times Shi_near + h_4 Shisame_C + h_5 \Delta SOE \times Shisame_C + Controls + IND + Year + \varepsilon \quad (8)$$

Descriptive Statistics

Table 2. Descriptive Statistics

Variable	Sample size	Mean value	Standard deviation	Minimum value	Median	Maximum value
TC	18735	0.15	0.29	- 1.06	0.13	0.99
Yingshou	18735	0.24	0.23	0.00	0.17	1.12
Supplier	18735	0.35	0.21	0.04	0.30	0.96
Customer	18735	0.30	0.22	0.01	0.25	0.99
Size	18735	22.03	1.29	18.96	21.86	26.92
SOE	18735	0.40	0.49	0.00	0.00	1.00
Largest	18735	0.35	0.15	0.08	0.33	0.75
ROA	18735	0.04	0.06	- 0.29	0.03	0.22
ShortDebt	18735	0.23	0.30	0.00	0.14	2.21
Firmage	18735	2.82	0.31	1.95	2.83	3.53

Cash	18735	0.18	0.13	0.00	0.15	0.72
Turnover	18735	15.84	62.02	0.20	5.39	659.30
Growth	18735	0.22	0.56	- 0.65	0.12	4.45
Yingyebili	18735	0.01	0.02	0.00	0.00	0.13
SOE_C	6046	0.39	0.37	0.00	0.31	1.00
△ *SOE*	6046	- 0.05	0.56	- 1.00	0.00	1.00
Indlink_C	3873	0.39	0.27	0.04	0.31	1.00
Indsame1_C	4037	0.16	0.29	0.00	0.00	1.00
Indsame2_C	4037	0.28	0.35	0.00	0.08	1.00
Sheng_near1	5233	0.16	0.23	0.00	0.00	0.98
Sheng_near2	5233	0.24	0.25	0.00	0.16	0.98
Sheng_near3	5233	0.02	0.05	0.00	0.00	0.30
Shengsame_C	5249	0.35	0.35	0.00	0.24	1.00
Shi_near1	4609	0.07	0.17	0.00	0.00	0.83
Shi_near2	4609	0.11	0.19	0.00	0.00	0.84
Shi_near3	4609	0.01	0.01	0.00	0.00	0.06
Shisame_C	5150	0.20	0.30	0.00	0.00	1.00

Table 2 provides descriptive statistics for variables , we can see that accounts receivable account for 24% of operating income, net accounts receivable are positive, indicating that accounts receivable dominated in transactions between enterprises and customers, mainly because China is the buyer's market, the customers' bargaining power is relatively larger. The average proportion of the top five suppliers' purchase value to the total purchase value is 35%, and the average proportion of the top five customers' sales value to the total sales value is 30%, it shows that Chinese enterprises have their own big customers and suppliers. The average proportion of state-owned enterprises in top five customers' transactions is 39%, the median is 31%, which shows that there are a certain proportion of state-owned enterprises in customers, and the proportion is moderate. △ SOE measures the differences of state-owned property rights between customers and enterprises, The larger the value is, the more state-owned property advantages the customers have over the enterprise, the mean value is -5% , the median is 0, indicating that the state-owned property rights of enterprises and customers are in balance. The average industry linkage between customers and enterprises is 39%, the proportion of the top five customers selling to customers in the same industry classified in detail is 16%, and the proportion selling to customers in the same industry classified in general is 28%, it shows that although customers and enterprises are not all from the same industry, the proportion of customers and enterprises in similar industry is high, and there is industry-related phenomenon. The proportion of enterprises selling to customers in the same province and city are 35% and 20%, the average proportions of the customers adjacent to the provincial and municipal boundaries of enterprises are 16% and 7%, and the average proportions of customers adjacent to the enterprises' provincial and municipal vertices are 24% and 11%. It indicates that there is a certain regional cluster between customers and enterprises, and the proportion is moderate.

Empirical Results

The Influence of State-owned Property Right Differences on Trade Credit

Negotiation Abilities

Table 3. The Effects of State-owned Property Right Differences on Trade Credit Negotiation Ability

Explained variable	(1)	(2)	(3)	(4)	(5)	(6)
	TC	*AR*	*AR*	*AR*	*TC*	*AR*
	All Samples	*All samples*	*SOE*	*Non-SOE*	*All samples*	*All samples*
SOE_C	0.151***	0.149***	0.111***	0.165***		
	(0.000)	(0.000)	(0.000)	(0.000)		
SOE	-0.072***	-0.071***				
	(0.000)	(0.000)				
△ SOE					0.099***	0.098***
					(0.000)	(0.000)
Supplier	-0.138***	-0.138***	-0.153***	-0.117***	-0.144***	-0.144***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Customer	0.158***	0.081***	0.247***	0.079**	0.177***	0.099***
	(0.000)	(0.000)	(0.000)	(0.017)	(0.000)	(0.000)
Size	-0.042***	-0.037***	-0.035***	-0.047***	-0.035***	-0.031***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Largest	-0.079**	-0.089***	-0.087*	-0.082	-0.067*	-0.077***
	(0.028)	(0.002)	(0.062)	(0.119)	(0.068)	(0.009)
ROA	-0.023	-0.123*	0.001	-0.066	-0.038	-0.138**
	(0.746)	(0.055)	(0.989)	(0.521)	(0.588)	(0.033)
ShortDebt	0.087***	0.106***	0.078***	0.092***	0.082***	0.102***
	(0.000)	(0.000)	(0.007)	(0.003)	(0.000)	(0.000)
Firmage	-0.109***	-0.086***	-0.045	-0.134***	-0.107***	-0.083***
	(0.000)	(0.000)	(0.205)	(0.000)	(0.000)	(0.000)
Cash	-0.031	0.015	-0.190***	0.040	-0.040	0.006
	(0.411)	(0.630)	(0.003)	(0.392)	(0.295)	(0.842)
Turnover	-0.000	-0.000***	0.000	-0.000**	-0.000	-0.000***
	(0.217)	(0.000)	(0.108)	(0.045)	(0.197)	(0.000)
Growth	-0.005	-0.002	-0.003	-0.007	-0.007	-0.004
	(0.326)	(0.731)	(0.669)	(0.318)	(0.172)	(0.441)
Year&Ind	Control	Control	Control	Control	Control	Control
Constant	1.304***	1.250***	0.983***	1.428***	1.176***	1.125***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
N	6062	6062	2718	3344	6062	6062
Adjusted R2	0.354	0.345	0.330	0.335	0.348	0.336
F value	21.137***	22.590***	8.882***	12.371***	20.832***	21.985***
SOE_C coefficient test between groups			7.22***			
			(0.007)			

The result of Hypothesis1 is shown in table 3, (1)(2) columns show the effect of the proportion of state-owned customers on the trade credit negotiation abilities. It can be seen that the larger the proportion of state-owned customers, the more trade credit the enterprise gives to customers, this is because state-owned customers have a lot of monopoly resources, and are easier to obtain government support and bank loans, have more abundant funds, less risks of bankruptcy, high stability of transaction, enterprises are more willing to trade with state-owned customers and offer trade credit, and the government behind the state-owned customers has a certain degree of enforcement, resulting in the state-owned customers have more bargaining power, enterprises give more trade credit to customers. In addition, we examine the result in groups and test on the nature of state-owned and non-state-owned property rights, the results are shown in columns (3)(4), and find that state-owned enterprises are less invaded by state-owned customers in trade credit compared to private enterprises, we test the influence of state-owned property right differences on trade credit negotiation ability further, and the results are as shown in columns (5)(6), it can be seen that although state-owned customers have strong bargain power, but the most important factors affecting the relative negotiation abilities are the resource differences between the two parties, when the state-owned property rights of the enterprises are more inferior to the customers, the enterprises give more trade credit to customers.

The Influence of Property Right Differences on Trade Credit Negotiation Ability under Different Industry Linkage

Table 4. The Effect of Property Right Differences on Trade Credit Negotiation Ability Under Different Industry Linkage

Explained variable	(1)	(2)	(3)	(4)	(5)	(6)
	AR Indlink_C	*TC Indlink_C*	*TC Indsame_C (small category)*	*TC Indsame_C (large category)*	*Large market share Indlink_C*	*Low market share Indlink_C*
△ *SOE*	0.133***	0.135***	0.119***	0.118***	0.065***	0.188***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.007)	(0.000)
Indlink_C	-0.019	0.024			0.030	0.017
	(0.349)	(0.289)			(0.298)	(0.603)
△ *SOE×Indlink_C*	-0.099***	-0.102**			0.001	-0.183***
	(0.007)	(0.013)			(0.977)	(0.002)
Indsame_C			0.001	0.002		
			(0.939)	(0.897)		
△ *SOE×Indsame_C*			-0.156***	-0.081***		
			(0.000)	(0.005)		
Control & Constant	YES	YES	YES	YES	YES	YES
N	3882	3882	3882	3882	1883	1999

Adjusted R2	0.348	0.310	0.313	0.310	0.372	0.307
F value	16.974***	14.961***	15.463***	15.530***	10.384***	10.276***
Cross term coefficient intergroup test (Chi2)					6.66***	
					(0.009)	

The result of hypothesis 2 is shown in Table 4, (1)(2) columns are tested by industry linkage between customers and enterprises. It can be seen that the higher industry linkage between customers and enterprises, the smaller the negative influence of state-owned property right disadvantage on trade credit negotiation ability, this is because the more similar the enterprises and customers' industries are, the closer the input-output relationships are, the greater the degree of dependence on both sides, and it is easier for them to achieve alliances by using similar technologies, knowledge, people and sharing same market. Therefore, private enterprises will have less bargaining disadvantage, and their trade credit negotiation ability will increase compared to state-owned customers, making it easier for enterprises to realize the community of interests in the same supply chain, cooperate to improve the competitive position of supply chain in the industry. (3) (4) columns are tested by the proportion of customers and enterprises in the same industry, we separate the industry using industry code in small category and large category, and reach same conclusions. The higher the proportion of customers and enterprises in same industry, the higher the degree of cooperation and coordination between the customers and enterprises, the greater the enterprises' trade credit bargain power, which can weaken the negative influence brought by the inferior position of the state-owned property right.

We make a further test grouped by the market share, and compare the influences of the industrial linkage between enterprises and customers on the reduction of trade credit encroachment under different market share, the results are shown in columns (5)(6). We found that when the market share of enterprises is smaller, the state-owned customers with high industry linkage have less effect on the enterprises' trade credit encroachment, but when the market share of enterprises is larger, the influence is not obvious. This result can explain better that the state-owned customers' reduction of trade credit encroachment is for the purpose of cooperation and synergy. When the enterprises are weak in the industry, state-owned customers in similar industries will worry that the enterprises' disadvantageous position in the industry will affect them through supply chain transactions, and will reduce the trade credit encroachment on enterprises to enhance the competitiveness of both sides in the industry with the attitude of long-term co-development with enterprises, and the customers' trade credit support will help more to enterprises with lower market share.

The Influence of Property Right Differences on Trade Credit Negotiation Ability in Different Regional Clusters

Table 5. Effects of Property Right Differences on Trade Credit Negotiation Ability in Different Regional Clusters

Explained variable	(1)	(2)	(3)	(4)	(5)	(6)
	Province			City		
	near1	*near2*	*near3*	*near2*	*near3*	*near3*
△ *SOE*	0.125***	0.130***	0.118***	0.108***	0.112***	0.106***

	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Sheng_near	-0.067***	-0.068***	-0.203**			
	(0.000)	(0.000)	(0.025)			
△ *SOE×Sheng_near*	-0.049	-0.044	-0.078			
	(0.146)	(0.205)	(0.670)			
Shengsame_C	-0.057***	-0.066***	-0.051***			
	(0.000)	(0.000)	(0.000)			
△ *SOE×Shengsame_C*	-0.060***	-0.065***	-0.054**			
	(0.010)	(0.010)	(0.017)			
Shi_near				-0.094***	-0.111***	-1.209***
				(0.000)	(0.000)	(0.000)
△ *SOE×Shi_near*				-0.100**	-0.100**	-1.088*
				(0.030)	(0.013)	(0.053)
Shisame_C				-0.020	-0.026	-0.020
				(0.264)	(0.154)	(0.276)
△ *SOE×Shisame_C*				-0.016	-0.019	-0.014
				(0.568)	(0.507)	(0.619)
Control & Constant	YES	YES	YES	YES	YES	YES
N	5233	5233	5233	4614	4614	4614
Adjusted R2	0.353	0.353	0.350	0.341	0.344	0.340
F value	19.551***	19.611***	19.548***	17.415***	17.737***	17.451***

The result of Hypothesis 3 is shown in Table 5. (1)-(3) columns are shown that the distances between the customers' and enterprises' provinces will reduce the degree of stated-owned customers' trade credit encroachment on enterprises, and we can see that the higher proportion of customers and enterprises in the same province, the enterprises' state-owned property right disadvantages have less negative influence on trade credit negotiation abilities, but the distances of provinces have no significant impact on the result. (4)-(6) columns are shown that whether customers and enterprises are in same city, and the distances between the parties' cities will reduce the degree of trade credit encroachment on enterprises, and we can see that the distances between the cities are closer, the enterprises' state-owned property right disadvantages have less negative influence on trade credit negotiation abilities, but whether customers and enterprises are in the same cities has no significant impact on the result. We use three methods to measure the regional clustering degree of enterprises and customers, including whether the border between the two provinces is adjacent (*near1*) , whether the vertices between the two provinces is adjacent (*near2*), and multiplying the reciprocal of the province (city) distance between the enterprise and the customer by provincial (city) border adjacent dummy variable (*near3*).

The results show that geographical distances between customers and enterprises have impacts on the synergy between the two parities, and city distance plays a greater role than provincial distance. Enterprises in the

same region can communicate more conveniently in information, materials, knowledge and technology, play a role in economies of scale, reduce transaction costs, increase spillover effects of knowledge, and achieve strategic alliances more easily, and the synergy effect mainly displays between the enterprises with close distances. Due to the geographical distances of different provinces, geographical agglomeration plays a relatively small role, while the synergy effect exerted by the same province is not as obvious as that exerted by the neighboring cities, the enterprises in the same cities have to compete with each other for resources, including government, market and other resources, will have a competitive effect among each other, but the enterprises with adjacent cities can achieve the greatest synergy, this kind of synergy effect can weaken the negative influence of state-owned property right disadvantage on trade credit negotiation ability.

Robustness Test

(1) We use PSM method to match the state-owned customers considering the possible differences in the characteristics of the enterprises. The samples were divided into test group and control group according to whether there are state-owned customers in the top five customers of the enterprises, and ensure that the two groups are basically consistent in terms of supplier concentration, customer concentration, and company characteristics, eliminating the bias caused by sample differences in the results. The conclusions remain unchanged after testing.

(2) Considering that not all companies disclose the names of their customers, following Gul et al.(2010), we use Heckman two-step method to test. Firstly, we define whether the enterprise discloses the customers' name (*Namedum*), then estimate the probability of the enterprises disclosing the customers' names by using the Probit model, calculate the inverse Mills ratio, and finally add the inverse Mills ratio into the regression model, the conclusions remain unchanged after testing.

(3) Considering the endogenous problem, we use instrumental variable method to test. We use the industry average of the proportion of state-owned customers (the average value excludes the data of the company), and dummy variable that whether the proportion of state-owned customers is higher or lower than the industry median as instrument variables, for the proportion of customers in the same industry, the proportion of customers in the same city and the geographical distances between customers and enterprises' cities, we use the industry average of the variables of other companies in the same industry in the same year (excluding the data of that company), and dummy variable that whether the variable is higher or lower than the industry median as instrument variables, pairwise multiply with the state-owned property right difference instrument variable, continuous variables multiply with continuous variables, dummy variables multiply with dummy variables. Finally, the conclusion remains the same, at the same time, we make test of weak instrument variables, under-identification and over-identification of instrument variables to prove that the instrument variables are appropriate.

(4) We add the net accounts payable, the natural logarithm of the registered capital of customers, the industry competitiveness of enterprises and customers as control variables, and the conclusion remains unchanged after testing.

Findings and Recommendations

We study the influences of state-owned property right differences between customers and enterprises on the trade credit negotiation abilities, as well as the influences of industry linkage and regional cluster on the improvement of the negotiation abilities of enterprises, to mitigate the impact of state-owned customers' encroachment on enterprises' trade credit based on the top five customers' names disclosed by listed companies, and found the following conclusions:

(1) The greater the disadvantage of an enterprise relative to the customers' state-owned property rights, the weaker the enterprises' trade credit bargain power. The bargain power between enterprises is affected by the resource differences between the two parties, and the state-owned property right is also a part of the enterprises' resources, which can obtain more support from government and banks, have lower level of bankruptcy risk. If the state-owned property resources of both sides are in unbalanced positions, the side with fewer resources will have weaker bargain power, and provide more trade credit to the other party.

(2) The stronger the industry linkage between the customers and enterprises, the smaller the negative influences of the state-owned property right disadvantage on the trade credit negotiation ability. When the customers and the enterprises' industries are more similar or in the same industry, the spillover effect of knowledge and technology degree is higher, the interdependence degree is greater, the customers are easier to form the strategic alliances with the enterprise, enhance the cooperation synergy level, co-development to improve the supply chain's competitive strength in the industry, trade credit negotiation ability increased. And when the market competitiveness of enterprises is weaker, the synergy effect between customers and enterprises is higher.

(3) The greater the regional clusters of customers and enterprises, the smaller the negative influences of state-owned property right disadvantages on the trade credit negotiation abilities. Regional clusters of customers and enterprises make it easier to communicate information, improve transaction efficiency, play economies of scale, share resources and knowledge, and achieve synergy goals. And the synergy effects work better when the companies and the customers are in different cities, and the distances between cities are close.

Based on the research conclusions, we put forward the following policy recommendations:

(1) When private enterprises sell to state-owned customers, they should consider establishing industry or regional alliances with customers to reduce the negative influences of state-owned property right disadvantages on trade credit negotiation abilities. State-owned customers often encroach the cash flow of upper private enterprises and demand more trade credit from the enterprises because of their high bargain power, but when the industry linkages are high or the cities are adjacent with each other, the degree of cooperation and coordination between the two sides will enhance. Private enterprises should make full use of this phenomenon to reduce the state-owned customers' encroachment on their trade credit.

(2) Even if the competitiveness of private enterprises in their own industries is weak, they may consider establishing alliances with customers in the same industries or with high industry linkage to alleviate the trade

credit negotiation disadvantages of enterprises, and promote cooperation between the two parties, to enhance the competitiveness of supply chain in the industry. The upstream and downstream enterprises with high industry linkage have more dependence on each other, exchange knowledge and technology more rapidly, and more favorable to realize alliances.

(3) When private enterprises want to establish regional alliances with customers, they should consider the customers who are in different cities but close to the cities of enterprises, the enterprises in different provinces are far away from each other, and there are competitions between enterprises in the same city, enterprises choosing customers in different cities but close to each other are more conducive to the realization of the alliance and reduce the trade credit encroachment from the state-owned customers.

Funding

This paper was supported by Tianjin Education Commission Scientific Research Project "The Economic Consequences and Influencing Factors of Inter-firm Debt-equity Swap" [No. 2017SK070].

References

Smith, J. K. (1987). Trade credit and informational asymmetry. *The Journal of Finance*, 42(4), 863-872.

Goto, S., Xiao, G., & Xu, Y. (2015). As told by the supplier: Trade credit and the cross section of stock returns. *Journal of Banking and Finance*, 60(8), 296-309.

Dass, N., Kale, J. R., & Nanda, V. (2015). Trade Credit, Relationship-Specific Investment, and Product Market Power. *Review of Finance*, 19(5), 1867-1923.

Jiang, W., & Zeng, Y. Q. (2013). Financial Development, Property Right and Signal Transmission role of Trade Credit. *Financial Research*, (06), 89-103.

Wang, Z. J., & Wang, Z. Q. (2017). The Working Capital Management Based on Vendor Relationship: "Icing on the Cake" or "Timely Help". *Nankai Business Review*, (02), 32-44.

Chen, S. L., & Liu, X. L. (2018). Economic Policy Uncertainty and Corporate Trade Credit Extension. *Financial Research*, (05), 172-190.

Zhang, T. S., & Li, Y. Y. (2019). Customer Relational Transaction, Product Uniqueness and Trade Credit Supply. *Accounting and Economic Research*, 33(01), 86-102.

Ferris, J. S. (1981). A transactions theory of trade credit use. *The Quarterly Journal of Economics*, 96(2), 243-270.

Kling, G., Paul, S. Y., & Gonis, E. (2014). Cash holding, trade credit and access to short-term bank finance. *International Review of Financial Analysis*, 32(2), 123-131.

Li, L. F., Zhang, W. H., & Lu, Q. R. (2018). How does Quality of Accounting Information Impact Debt Financing in Private Enterprises: The Role of Monetary Policy. *Accounting Research*, (04), 66-72.

Barrot, J. N. (2016). Trade credit and industry dynamics: Evidence from trucking firms. *The Journal of Finance*, 71(5), 1975-2016.

Li, R. S., & Liu, H. X. (2016). Supply Chain Relationship and Trade Credit Financing: Competition or Cooperation. *Contemporary Finance and Economics*, (04), 115-127.

Xiao, Z. P., & Liu, C. Y. (2017). Bargaining power of Upstream and Downstream Enterprises, Product

Uniqueness and Trade Credit—Empirical Evidence from Listed Chinese Manufacturing Companies. *Securities Market Herald*, (9), 33-41.

Klapper, L., Laeven, L., & Rajan, R. (2012). Trade Credit Contracts. *Review of Financial Studies*, 25(3), 838-867.

Giannetti, M., Burkart, M., & Ellingsen, T. (2011). What You Sell Is What You Lend? Explaining Trade Credit Contracts. *Review of Financial Studies*, 24(4), 1261-1298.

Dahl, R. A. (1957). The concept of power. *Behavioral science*, 2(3), 201-215.

Gulati, R., & Sytch, M. (2007). Dependence asymmetry and joint dependence in interorganizational relationships: Effects of embeddedness on a manufacturer's performance in procurement relationships. *Administrative science quarterly*, 52(1), 32-69.

Wu, Z., & Choi, T. Y. (2005). Supplier–supplier relationships in the buyer–supplier triad: Building theories from eight case studies. *Journal of Operations Management*, 24(1), 27-52.

Fabbri, D., & Klapper, L. F. (2016). Bargaining power and trade credit. *Journal of Corporate Finance*, 41(7), 66-80.

Pan, H. B., Xia, X. P., & Yu, M. G. (2008). Government Intervention, Political Connections and the Mergers of Local Government-Controlled Enterprises. *Economic Research*, (04), 41-52.

Kong, D. M., Liu, S. S., & Wang, Y. N. (2013). Market Competition, Ownership and Government Subsidy. *Economic Research*, 48(02), 55-67.

Jin, B. (2010). Repositioning State-owned Enterprises Reform. *China Industrial Economics*, (04), 5-13.

Li, X. J., Ai, X. Z., & Tang, X. W. (2017). Technological innovation value and spillover effect based on supply chain competition. *Journal of Systems Engineering*, (06), 808-817.

Li, G. H., Zhang, H. L., & Huang, L. (2017). Resource Conditions and Internal Mechanism of Supplier's Ingredient Brand Value Formation: An Exploratory Analysis Based On Multiple Cases. *Chinese Journal of Management*, (10), 1505-1514.

Pan, W. Q., Li, Z. N., & Liu, Q. (2011). Inter-industry Technology Spillover Effects in China: Evidence from 35 Industry Sectors. *Economic Research*, 46(07), 18-29.

Lu, L. J., Yu, H. D., & Lu, Y. (2011). Specialized Market and Industrial Cluster: Linkage and Influential Factors. *China Industrial Economics*, (01), 151-160.

Sun, P. Y., Jiang, W., & Chen, W. (2015). Foreign Capital liberalization, Technological Distance and Export of Chinese Enterprises—Based on the Perspective of upstream and downstream Industry Linkage. *Management World*, (11), 53-69.

Han, K., Chang, Y. B., & Hahn, J. (2011). Information technology spillover and productivity: the role of information technology intensity and competition. *Journal of Management Information Systems*, 28(1), 115-146.

Bao, Q., Ye, N. H., & Wang, Y. L. (2015). Foreign Competition, Industrial Linkage and Domestic Firms' Survival in China. *Economic Research*, 50(07), 102-115.

Wang, Z., & Sun, J. (2017). Analysis of interregional industry linkage and economic distance in China: evidence from the mining industry. *Applied Economics*, 49(6), 606-617.

Wang, R. Y., Liang, Q., & Li, G. G. (2018). Virtual Agglomeration: A New Form Of Spatial Organization Deeply Integrated with New Generation of Information Technology And Real Economy. *Management World*, 34(02), 13-21.

Humphrey, J., & Schmitz, H. (2002). How does insertion in global value chains affect upgrading in industrial clusters. *Regional studies*, 36(9), 1017-1027.

Boschma, R. (2005). Proximity and innovation: a critical assessment. *Regional studies*, 39(1), 61-74.

Tang, S. Y., & Li, D. (2019). Customers' Geographical Distance Proximity and Corporates' Information Quality. *China Accounting Review*, 17(01), 21-48.

Patatoukas, P. N. (2012). Customer-Base Concentration: Implications for Firm Performance and Capital Markets. *The Accounting Review*, 87(2), 363-392.

Gul, F. A., Kim, J., & Qiu, A. A. (2010). Ownership concentration, foreign shareholding, audit quality, and stock price synchronicity: Evidence from China. *Journal of Financial Economics*, 95(3), 425-442.