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The Trade Credit Transfer Activity of Small and Medium-Sized Enterprises

—Empirical study based on the sampling survey of the SMEs in China

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Abstract— **The small and medium-sized enterprises (SMEs) may dispense financial stress, which resulted from providing buyers with trade credit, to suppliers through the supply chain. This is described as "Trade Credit Transfer Activity" caused by SMEs' liquidity requirements in this paper. Based on the sampling survey on the SMEs in China, this paper carries out an empirical study on the correlation between the SMEs' trade credit forms, terms and levels in purchase and those in sale respectively. The results of empirical analysis corroborate the existence of "Trade Credit Transfer Activity" in SMEs' business operation. It may provide a new perspective on SMEs' financing and credit risk management.**

Keyword-Small and medium-sized enterprises; Trade Credit; Transfer Activity; Liquidity

I. INTRODUCTION

Trade credit is a kind of credit form based on purchase and sale process. The creditor plays the role of credit supplier by paying in advance or deferring collecting. On the other hand, the debtor acts as credit receiver, because it could finance short-term working capital by collecting in advance or deferring payment. The policy of permitting trade credit has been carried out since the 1980s in China. During the past 20 years, trade credit turns out to be prevalent in business and plays an important role in enhancing fund allocation, reducing transaction costs, and accelerating commodity circulation. Especially, as for those small and medium-sized enterprises (SMEs), which are facing capital constraints in traditional financial structure, trade credit has been an important source of short-term external funds besides bank credit, which is so called 'Trade Credit Channel' by some scholars. However, SMEs use trade credit to finance their purchases (accounts payable) as well as to offer financing to their buyers (accounts receivable). Many SMEs are also financially constrained caused by providing trade credit. What information would be revealed from the different trade credit behaviors in different business process? Is there "trade credit transfer activity" which resulted in the correlation between the trade credit behavior in purchase and that in sale? The purpose of this paper is to answer these questions. This study may benefit for better understanding the characteristic of SMEs' trade credit, and improving the SMEs' credit risk management.

II. LITERATURE REVIEW

Researches on trade credit originally focused on the explanations why trade credit is so prevalent. The literatures fall into two categories, which are business motive explanation (to offer trade credit) and financing motive explanation (to acquire trade credit).

As to the business motive explanation, it mainly includes three theories established on the perspective of transaction cost, non-price competition and quality guarantee. The theory of transaction cost asserts that trade credit could substantially reduce the transaction costs involved in paying and managing invoices between suppliers and buyers (Schwartz, 1974). As trade credit separates the payment cycle from the delivery cycle, both the supplier and the buyer could save transaction costs or reduce the demand for cash holdings, by paying bills collectively rather than making payments every time the goods are delivered. The non-price competition theory states that the credit terms, as well as the guarantee measures to assure the credit terms are the integral parts of the effective price of products (Mian and Smith, 1992). It is equivalent to providing price subsidy (price reduction) that the supplier offers easier terms of payment to the buyer. Offering trade credit can be regarded as a non-price competitive tool to promote sales, immune from the legal restrictions against price discrimination. Moreover, the supplier could differentiate trade credit clauses to different buyers to develop and maintain its target clients so as to stabilize its market share (Schwartz and Whitcomb, 1978; Summers and Wilson, 1999). In this sense, the suppliers who offer trade credit may act from a kind of special investment motive (Ng, 1999; Smith, 1987; Wilson and Summers, 2002). Quality guarantee theory holds that trade credit includes implicit quality guarantees. By offering trade credit the supplier gives the buyer time to test the goods and the buyer could refuse paying if any quality problems arise (Akerlof, 1970; DeLoof and Jegers, 1996). Moreover, as a kind of indicator, the trade credit clauses, which include the different credit terms and cash discount rates, could reflect the quality of the goods which the suppliers provide. Thus, the buyer would be able to judge the quality of goods through the different trade credit clauses the suppliers offer, so that the

adverse selection problem and opportunistic behavior could be overcome.

As to the financing motive explanation, previous researches mainly focused on credit rationing and firm liquidity. The theory of credit rationing insists that trade credit is an important source of short-term external funds besides bank loan for SMEs which are not access to the traditional financial system caused by credit rationing (Petersen and Rajan, 1994, 1997; Banerjee, Dasgupta and Kim, 2004). The SMEs suffering financing constraint would rely on the trade credit acquired from large firms to fill the financing gap. Different from SMEs, large firms are less constrained in funds enjoying comparative advantages in credit market. Therefore, as a kind of credit transfer channel, large firms could transfer fund obtained from credit market to SMEs by providing trade credit. Trade credit indeed functions as a transmission mechanism through which bank credit was redistributed from the firms with strong financial position to the financially weaker ones.

Scholars who hold firm liquidity theory argue that the firms' purpose of acquiring trade credit is to balance the liquidity of their assets. Firms may have the liquidity assets (accounts receivable) by offering trade credit to their buyers driven by business motive. Therefore, it is necessary for them to acquire trade credit from their suppliers to keep liquidity. Several studies suggest that most firms would match the maturity between their assets and liabilities. They find a strong correlation between the short-term capital demand and the assets characteristic of a firm. The firms that their assets are mainly liquid assets (except for cashes) are more in need of trade credit (Diamond, 1991, Hart and Moore, 1991). Daniela Fabbri and Leora Klapper (2008) state that firms that receive trade credit from their suppliers are more likely to extend trade credit to their buyers so that to "match maturity" between the contract terms of payables and receivables. This matching practice is more likely prevalent when firms face strong competition in the product market (relative to their buyers), and enjoy strong market power in the input market (relative to their suppliers).

Our study is based on the previous researches. In supply chain, SMEs use trade credit to finance their input purchases as well as to offer financing for their buyers. They are not only the provider of trade credit, but also the receiver as well. Since SMEs are usually in the weak position in the market, facing the buyers with strong market power, they have to provide trade credit to attract clients and expand market share. While at the same time, being at a disadvantage in the financial market as well, SMEs are suffered from credit rationing. Driven by the financing motive, SMEs count on trade credit to fill their short-term capital gap and to keep liquidity. The combined effect may result in "Trade Credit Transfer Activity" in business. More specifically, SMEs usually make use of the trade credit acquired from their suppliers in purchase, to support the provision of trade credit for their buys in sale through the supply chain. In this way, SMEs may transfer the financial pressure caused by offering their buyers with trade credit to their upstream suppliers.

III. DATA AND HYPOTHESES

We carried out a sampling survey on SMEs in Beijing, China. The informations collected are divided into two categories, financial informations and non-financial informations. Financial informations include assets size, account receivable, account payable, operating revenues and operating costs. Non-financial informations include the forms and terms of trade credit. 2019 questionnaires have been sent out and 879 valid samples were collected. Based on the samples mentioned above, we conducted the empirical analysis on the "trade credit transfer activity" in SMEs' business by testing the correlations between trade credit forms, terms and levels in purchase and those in sale. The hypotheses are summarized as follows:

A. Hypothesis about trade credit forms

Trade credit forms include forms of collection in sale and forms of payment in purchase. In detail, there are three forms of collection, which are "collecting in advance", "no credit" and "deferring collection". The forms of payment include "paying in advance", "no credit" and "deferring payment". If trade credit transfer activity does exist, there should be correlation between the forms of collection and those of payment.

B. Hypothesis about trade credit terms

The terms of trade credit are divided into 5 intervals, "shorter than 1 month", "1 to 3 months", "3 to 6 months", "6 to 12 months" and "longer than 12 months". If trade credit transfer activity does exist, there should be correlation between the terms of credit offered for buyers and those of credit received from suppliers.

C. Hypothesis about trade credit levels

Trade credit levels could be used to measure the extent of trade credit scale in SMEs' business. In this study, accounts receivable to total assets (AR/TA) ratio and accounts payable to total liabilities (AP/TL) ratio are adopted as the indicators reflecting the trade credit levels. AR/TA ratio reflects the proportion of a firm's assets used to provide trade credit for buyers, and the AP/TL ratio describes the proportion of a form's liabilities composed by the trade credit received from suppliers. Besides, from the aspect of SMEs' operating, we add two indicators, accounts payable to operating costs (AP/OC) ratio and accounts receivable to operating revenues (AR/OR) ratio. Similarly, AP/OC ratio shows the proportion of the operating costs contributed by trade credit received from suppliers, and AR/OR ratio implies how much the operating revenues are taken up by the trade credit offered for buyers. If trade credit transfer activity does exist, there should be correlation between the trade credit levels in purchase and those in sale.

IV. RESULTS AND DISCUSSION

A. The empirical test result of hypothesis about trade credit forms

Firstly, we carry out a statistic analysis on the forms of collection and payment in SMEs' business separately. As the

result shown in Table Ⅰ, no matter in sale or in purchase, the pecking order of forms is certain, that is "deferring collection/payment", "no credit" and "collecting/paying in advance" in descending order. It suggests that goods exchange is always prior to cash exchange in general. It means that selling on credit is prevalent in sale, and buying on credit is dominant in purchase. According to the analysis, trade credit provision turns out to be more prevalent in sale than that in purchase. On the other hand, trade credit acquirement tends to be more popular in purchase than that in sale.

TABLE I. FORMS OF TRADE CREDIT IN PURCHASE AND SALE

Process \ Forms	In advance	No credit	Deferring	Mixture
Sale (collection)	13.3%	17.1%	58.0%	11.6%
Purchase (payment)	16.7%	29.0%	39.5%	14.8%

Note：1.Mixture is the form combined two forms or more than two forms；2. 879 samples.

Secondly, we specify the hypothesis as follows:

H0: The forms of collection are independent with those of payment.

H1: The forms of collection are correlated with those of payment.

We get 702 samples which have single form of collection and single form of payment. Then we conduct contingency analysis and independent test on the forms of collection and those of payment, and the results are shown in Table Ⅱ and Table Ⅲ. Chi-Square test result shows that P value is less than 0.001. It means that H0 cannot be accepted, namely, there is correlation between the forms of collection and those of payment.

TABLE II. CROSSTABULATION OF TRADE CREDIT FORMS

			Forms of payment			Total
			A	*B*	*C*	
Forms of collection	*A*	Count	40	37	24	101
		% of Total	5.7	5.3	3.4	14.4
	B	Count	34	73	27	134
		% of Total	4.8	10.4	3.8	19.1
	C	Count	69	134	264	467
		% of Total	9.8	19.1	37.6	66.5
Total		Count	143	244	315	702
		% of Total	20.4	34.8	44.9	100.0

Note: 1、Forms of collection: A: Collecting in advance; B: No credit; C: Deferring Collection ; 2、Forms of payment: A: Paying in advance; B: No credit; C: Deferring Payment.

TABLE III. CHI-SQUARE TESTS ON CONTINGENCY TABLES

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	89.630[a]	4	.000
Likelihood Ratio	90.132	4	.000
N of Valid Cases	702		

Note: a.0 cells (.0%) have expected count less than 5. The minimum expected count is 20.57.

As shown in Table Ⅱ, the forms of collection influence those of payment significantly. The SMEs which collect in advance are likely to pay in advance, and the proportion is 5.7%. Similarly, the SMEs which make cash transaction in sale are prone to make cash transaction in purchase, and the proportion is 10.4%. Correspondingly, the SMEs would like to acquire trade credit from suppliers if they offer trade credit to buyers, and the proportion is 37.6%. On the contrary, the forms of payment have relatively weak impact on those of collection. No matter what the forms of payment are, the largest proportion of the collection form is deferring collection. However, it is worth to mention that, the proportion increases in turn when the forms of payment are paying in advance (9.8%), no credit (19.1%) and deferring payment (37.6%) respectively.

B. The empirical test result of hypothesis about trade credit terms

We pick up samples with deferring collection/payment and also have disclosed specific terms to analyze the terms of trade credit. As Table Ⅳ shows, the SMEs' terms of trade credit are mainly shorter than 6 months no matter in sale or in purchase. Moreover, the terms distribution of collection is similar to that of payment. Term of "1-3 month" takes up the largest proportion (more than 50%) both in sale and purchase. Term of "3-6 months" and "shorter than 1 month" follow up. The term "over 6 months" takes the smallest proportion. The terms of payment are shorter than those of collection as a whole.

TABLE IV. SUMMARY OF TRADE CREDIT TERMS

Code	Term	Collection (%)	Payment (%)
A	< 1 month	14.8	25.3
B	1-3 months	50.5	54.3
C	3-6 months	28.5	17.9
D	6-12 months	5.8	2.2
E	> 12 months	0.4	0.3
Num of Samples		533	363

Then, we continue to look into details of the samples which have disclosed both term of collection and that of payment (299 samples) to compare the trade credit terms (See Table Ⅴ). It shows that more than 50% samples' trade credit terms in sale and purchase are in the same interval. Besides, samples with longer terms of collection are more than those with longer terms of payment.

TABLE V. COMPARISON BETWEEN TERMS

Length of term	Proportion (%)
same interval	55.2
Term of collection is longer	33.4
Term of payment is longer	11.4

Note：299 samples.

We specify the hypothesis of trade credit terms as follows:

H0: The terms of collection in sale are independent with those of payment in purchase.

H1: The terms of collection in sale are correlated with those of payment in purchase.

The results of contingency analysis and independent test on the terms of collection and payment are shown in Table Ⅵ and Table Ⅶ. Chi-Square test result shows that P value is less than 0.001. It means that H0 cannot be accepted, namely, there is correlation between the terms of collection and those of payment.

TABLE VI. CROSSTABULATION OF TRADE CREDIT TERMS

			Terms of payment				Total
			A	*B*	*C*	*D*	
Terms of collection	*A*	Count	36	11	1	1	49
		% of Total	12.0	3.7	0.3	0.3	16.4
	B	Count	32	90	12	0	134
		% of Total	10.7	30.1	4.0	0.0	44.8
	C	Count	10	51	35	2	98
		% of Total	3.3	17.1	11.7	0.7	32.8
	D	Count	0	6	7	4	17
		% of Total	0.0	2.0	2.3	1.3	5.7
	E	Count	0	0	1	0	1
		% of Total	0.0	0.0	0.3	0.0	0.3
Total		Count	78	158	56	7	299
		% of Total	26.1	52.8	18.7	2.3	100.0

Note: A: < 1 month; B: 1-3 months; C:3-6 months; D:6-12 months. E: > 12 months

TABLE VII. CHI-SQUARE TESTS ON CONTINGENCY TABLES

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	145.025 [a]	12	.000
Likelihood Ratio	123.111	12	.000
N of Valid Cases	299		

Note: a.10 cells (50.0%) have expected count less than 5. The minimum expected count is 0.02.

As depicted in Table Ⅵ, SMEs with short term of collection have relatively short term of payment, and vice versa.

C. The empirical test result of hypothesis about trade credit level

The descriptive statistics results of trade credit levels, derived from the samples which have complete financial data including accounts receivable and accounts payable, are shown in Table Ⅷ and Table Ⅸ. Generally speaking, AR/TA ratios are quite close to the AP/TL ratios. In detail, the mean value of the AP/TL ratios is 24.67% and it is similar to the result (22.97%) derived from sampling survey on manufacturing enterprises in Jiangsu Province (China) carried out by Zhang Jie and Liu Dong (2006), but lower than that of SMEs in the U.S. (31.33%) delivered by Bernanke (1995). Moreover, the AP/OC ratios are close to AR/OR ratios too, the mean values of which are 20.43% and 20.82% respectively. This result implies that the trade credit offered by SMEs for buyers in sale is in the same level with that SMEs receive from suppliers in purchase on the whole.

TABLE VIII. DESCRIPTIVE STATISTICS OF AP/TL RATIOS AND AR/TA RATIOS

	N	Minimum	Maximum	Mean	Std. Deviation
AP/TL Ratio	610	0	95.00%	24.67%	19.88%
AR/TA Ratio	610	0	79.00%	21.23%	17.38%

TABLE IX. DESCRIPTIVE STATISTICS OF AP/OC RATIOS AND AR/OR RATIOS

	N	Minimum	Maximum	Mean	Std. Deviation
AP/OC Ratio	608	0	236.00%	20.43%	28.39%
AR/OR Ratio	601	0	149.00%	20.82%	21.49%

Then, we carry out the correlation analysis on the trade credit levels both in sale and in purchase. Table Ⅹ shows the correlation between AR/OR ratios and AP/OC ratios. The results display that the correlation is significant, for the P value is close to zero, and the correlation coefficient is 0.331. Furthermore, the results listed in Table Ⅺ suggests that the correlation between AR/TA ratios and AP/TL ratios is significant too, for the P value is close to zero as well, and the correlation coefficient is 0.252, slightly less than that between AR/OR ratios and AP/OC ratios.

TABLE X. CORRELATIONS BETWEEN AR/OR RATIOS AND AP/OC RATIOS

			AR/OR Ratio	AP/OC Ratio
Kendall's tau_b	AR/OR Ratio	Correlation Coefficient	1.000	0.331**
		Sig.(2-tailed)	.	.000
		N	601	599
	AP/OC Ratio	Correlation Coefficient	0.331**	1.000
		Sig.(2-tailed)	.000	.
		N	599	608

Note: **. Correlation is significant at the 0.001 level (2-tailed).

TABLE XI. CORRELATIONS BETWEEN AR/TA RATIOS AND AP/TL RATIOS

			AR/TA Ratio	AP/TL Ratio
Kendall's tau_b	AR/TA Ratio	Correlation Coefficient	1.000	0.252**
		Sig.(2-tailed)	.	.000
		N	610	610
	AP/TL	Correlation Coefficient	0.252**	1.000

	Ratio	Sig.(2-tailed)	.000	.
		N	610	610

Note: **. Correlation is significant at the 0.001 level (2-tailed).

V. CONCLUSIONS

There is trade credit transfer activity in SMEs' business caused by the SMEs' need to keep the liquidity of assets. SMEs usually transfer the financial pressure, which resulted from providing buyers with trade credit, to their upstream suppliers through the supply chain. Namely, SMEs always make use of the trade credit acquired from their suppliers in purchase to support the provision of trade credit for their buys in sale. In this study, it is corroborated by empirical analysis on the correlations between the SMEs' trade credit forms, terms and levels in purchase and those in sale respectively based on the sampling survey on the SMEs in Beijing, China.

Firstly, the results provide a new perspective to improve SMEs financing. Since the SMEs' trade credit behaviors in sale have significant impact on those in purchase caused by the trade credit transfer activity, it could increase the liquidity in purchase by increasing the liquidity in sale so that SMEs could accelerate the turnover of the fund and improve their liquidity. The analysis on the forms and terms of SMEs' trade credit shows that the liquidity risk of SMEs should not be ignored. Though credit transfer activity could somehow release the SMEs' financial distress, SMEs are still under the cash flow pressure. Therefore, besides encouraging banks to lend more to SMEs, other measures should be given more attention to improve SMEs financing, such as speeding up the development of supply chain financing and developing commercial bills. The commercial bills, being regulated more effectively and easy to transaction, could promote the expansion of the trade credit transaction scale. Moreover, a better social credit system will improve the accessibility and accuracy of trading information, so that bills signed and issued or endorsed by SMEs would be widely accepted by their counterparties. Thus, the SMEs could conveniently obtain short-term financing to release financial distress by the tools of commercial bills.

Secondly, the finding of trade credit transfer activity in SMEs' business offers us a clue to identify and manage SMEs' credit risk. Because different SMEs have different abilities to transfer the financial pressure to their suppliers resulted from different status in trade credit market, they may differ in liquidity situations and credit risk levels. Therefore, we could improve the efficiency of credit risk management of SMEs by monitoring their status in trade credit market and abilities to transfer trade credit in business.

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