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Study of Who Supplies Funds for Trade Credit

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Abstract. This study examined the relationship between trade credit and its financing structure using the financial statement data of Chinese listed firms from the year 2003-2018. I find that trade credit is positively related to external funds rather than internal funds. The amount of trade credit is significantly positive with equity, bank loans and credit received from suppliers. As for the effect of short-term loan and long-term loan on trade credit. short-term loan is positively related to trade credit, while long-term loan is negatively related to trade credit. Furthermore, stated-owned enterprise issue more trade credit as they have better access to the financial market. Big firms are likely to issue more trade credit, whereas fast growing firms would issue less trade credit.

Keywords: trade finance; finance structure; pecking order.

1. Introduction

Recent studies have shown that non-financial firms in developing countries has played the role of financial intermediaries. the findings witnessed that financial assets increase as financial liabilities increase which violate the pecking order theory. It means that firms borrow in order to lend.(Hattori, Shin and Takahashi 2009, J, C and Y. 2015, Du, Li and Wang 2017) [1-3]Trade credit, as an important means for non-financial firms to intermediate credit to the market, has played a significant role in the market where small and medium sized enterprises have no access to institutional finance.

Using a sample of Chinese non-financial listed firms from the period 2003-2018, this study empirically tested the relationship between trade credit and firms' finance structure and find that firstly the amount of trade credit offered to the market is positively related to external funds rather than internal funds. And as to external funds, though both equity funds and debt funds are significantly positive to trade credit, firms prefer to use equity funds to finance trade credit rather debt finance. The specific finance structure and trade credit phenomenon violate the theory of pecking order (Myers 1984) [4]which predict that firms would finance their projects in internal funds, debt funds and equity funds order.

This study differs from the prior research about trade credit in following two points: firstly, it focuses on the intermediary role of trade credit, and study the relationship between trade credit and internal funds, external funds including equity and bank loans. Secondly, it studies the role that controlling share nature plays in the relationship between trade credit and firms finance structure. Whereas the prior researches mainly focused on the complementary or supplementary role of trade credit to bank credit. (Rahman, Rozsa and Cepel 2018, Deloof M 2011, C. 2007, Mateut and Chevapatrakul 2018, Love, Preve and Sarria-Allende 2005, Danielson M G and A. 2004, Fisman and Love 2003, De Blasio and De Blasio 2003),[5-12] or the profitability of investing on trade credit.(Dary and James 2019) [13]

The rest of the article is organized in the following way. Firstly, the paper presents theories and hypothesis. Secondly, I describe the data. Thirdly, there is the empirical result. And finally, the paper concludes and discusses suggestion for future research.

2. Theory and Hypothesis

Pecking order theory (Myers 1984) [4]has pointed out that firms prefer internal finance, and if external finance is required they would first issue debt and then equity because the cost of those finance means are different.

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As trade credit is both means for enlarging business and means for intermediary behavior. The usage of trade credit is very complex. If the competition of the market is very severe, firms may issue more trade credit to sell goods. And the profit would usually be very low in such situation. In this case, using more expensive means to finance trade credit would seem to be irrational. If the competition is not severe, the firms can sell more to get more profits or if the firms would like to manage their earning, it is rational to use trade credit no matter what kind of finance source is as long as the profit of selling good would cover the finance cost.

Zhengfei and Kangtao. (2004)[14] pointed out that Chinese firms have equity finance preference due to low cost of equity funds, or to avoid bankruptcy risk because of debt finance, or firms may have a too high leverage to raise money from financial institution. And they find that in the period of 1998-2000 the average equity finance cost is lower than the debt finance cost.

And as for the use of internal funds, Shin and Zhao (2013) [15]find that financial asset of non-financial firms in developing economies is positively related to financial liability. Moreover, J, C and Y. (2015), Du, Li and Wang (2017) [2,3]find that financial liability flows to firms' trade credit account, and the return of financial assets is much higher than the return of total assets. Thus, the chance cost of internal funds may be more expensive than debt.

Based on the argument, we have the following hypothesis:

H1: trade credit is negatively related to internal funds finance, and positively related to external funds finance, and credit granted by their suppliers.

H2: trade credit is positively related to equity finance and bank loan finance.

H3: trade credit is positively related to both short-term loans and long-term loans.

State-owned firms (SOE) have a born advantage compared to non-stated-owned (NSOE) for the following reason: First, they share the same owner with financial institutions including state-owned banks and the stock exchange market. Thus, it would be easier and the cost may be lower for them to get access to funds whether equity finance or debt finance. Second, the business scope of State-owned enterprises always covers big industry such as energy resources, public transportation and real estate, so the size is easier to grow big. And the financial market has a tendency to embrace big sized firms. and firms have more access to financial resources would grant more trade credit, thus we have the following hypothesis:

H4: state owned enterprise would use more external funds to finance trade credit.

3. Research Design

3.1 Sample Selection.

The sample is from Chinese listed firms in the period from 2003 to 2018. Using the financial report of the sample, this paper tested the relationship between trade credit and firms' financial structure. The following sample was deleted: first, I deleted financial listed firms. second, I deleted ST (Special Treatment) firms and PT (Particular Transfer) firms whose financial status is abnormal. Third, I deleted firms with obscure information disclosure. All the data is winsorized in 1%-99% level and the software used to do the empirical test is Stata 13.0.

3.2 Empirical Model.

$$lnARtosales_{it}=b_0+b_1lninfundstosales_{it}+b_2lnexfundstosales_{it}+b_3lnAPtosales_{it}+b_4Controls+year+industry+u_i+e_{it} \quad (1)$$

$$lnARtosales_{it}=b_0+b_1lninfundstosales_{it}+b_2lnequitytosales_{it}+b_3lnbankloantosales_{it}+b_4lnAPtosales_{it}+b_5Controls+industry+u_i+e_{it} \quad (2)$$

$$lnARtosales_{it}=b_0+b_1lninfundstosales_{it}+b_2lnequitytosales_{it}+b_3lnshortermdebtosales_{it}+b_4lnlongtermdebt_{it}+b_5lnAPtosales+b_6Controls+year+industry+u_i+e_{it} \quad (3)$$

In equations (1)-(3), *lnARtosales* stands for the logarithm of accounts receivable to sales. It is the proxy for trade credit granted by the listed firms. *Lninfundstosales* stands for the logarithm of internal funds to sales. *Lnexfundstosales* means the logarithm of internal funds to sales. *lnAPtoales* means the logarithm of accounts receivable to sales. And *lnbankloanstosales, lnshorttermdebtosales,*

lnlongtermdebtosales stand for the logarithm of total bank loans to sales, short-term loans to sales, long-term loans to sales, respectively. According to Han, Tian and Li (2017)[16], the paper measures internal funds as the sum of surplus profit and undistributed profit, and measures external funds as the sum of equity funds and bank loan funds. Equity funds is measured as the sum of paid-in capital and capital reserve. The control variables are comprised of the variables stands for firms' characteristics such as firm age, size, logarithm of sales, leverage, collateral, growth and return of assets.

4. Empirical Results

4.1 Summary Statistics

This paper has a sample of 3045 firms with 14993 observations. There are 1162 State owned enterprises with 8284 observations, and the rest are non-state-owned enterprise. And firms issue lots of trade credit, the average number of trade credit they delivered to the market is 0.22 to sales. And compared to internal funds, external funds are much larger in amount. The average number of internal funds to sales is 0.53, while the average number of external funds to sales is 1.63, almost three times to the internal funds. Moreover, equity finance makes a huge contribution to external funds, its average number is 1.07, accounts for two thirds of external funds.

Table 1. Summary statistics.

Variables	mean	p50	sd	min	max	N
Artosales	0.22	0.14	0.25	0	1.38	14993
Bankloantosales	0.49	0.26	0.7	0	4.39	14993
Shortermdebtosales	0.29	0.17	0.37	0	2.1	14346
Longtermdebtosales	0.24	0.04	0.52	0	3.51	12675
Lnlongtermdebtosales	19.32	19.34	2.21	13.32	24.58	9210
Bondtosales	0.06	0	0.17	0	1.04	10642
Debtosales	0.54	0.29	0.78	0	4.86	14993
Equitytosales	1.07	0.6	1.52	0.04	10.74	14993
Exfundstosales	1.63	1.03	1.99	0.1	13.56	14993
Aptosales	0.18	0.14	0.15	0.01	0.88	14975
Infundstosales	0.53	0.29	0.89	0.02	6.95	14993
Age	11.55	11	6.16	0	24	14993
Roa	0.05	0.04	0.05	0	0.25	14993
Growth	0.33	0.18	0.57	0	4.46	14993
Tangi	0.25	0.21	0.18	0	0.75	14993
Lnsales	21.41	21.31	1.48	17.74	25.35	14993
Leverage	0.48	0.48	0.2	0.07	0.92	14993
Size	22.1	21.96	1.29	19.43	25.97	14993
Artosize	0.11	0.08	0.1	0	0.46	14993
Apstosize	0.09	0.07	0.07	0	0.34	14975

4.2 Regression Results

4.2.1 Trade Credit and Finance Structure

Table 2 shows the regression result of H1-H3. The results in Model (1) tells that trade credit is negatively related to internal funds finance in a 10% significance level. As the amount of internal funds increases, the amount of trade credit decreases. The result shows that trade credit significantly positively related to external funds in a 1% significance level. As the amounts of external finance increases in 1%, controlled other situations, the firms would grant 0.317% more of trade credit averagely. The result also shows that trade credit is supplied by firms' supplier. If firms' suppliers grant the firms more trade credit, they would also delivery more trade credit to their customers. If

firms receive 1% more credit from their supplier, they would grant their customer 0.232% more of trade credit on average.

The results in model (2) tells that trade credit is negatively related to internal funds finance in a 10% significance level. As the amount of internal funds increases 1%, the amount of trade credit decreases 0.028%. The result in model (2) documents that trade credit is significantly positively related to the credit firms get from their supplier, and bank loans as well as equity. Among the three sources of finance. Equity plays a most significant role. The coefficient of *lnequitytosales* is much bigger than those of *lnAPtosales* and *lnbankloanstosales*. Almost four times larger than that of bank loan coefficient.

And as the role of short-term loans and long-term loans play in the process of trade credit grant, model (3) shows that short-term loan is significantly positive to trade credit, while long-term loan is negatively related to trade credit. All three models show that trade credit is positively to firm size and negative to growth.

Table 2. trade credit and finance structure. The dependent variable is LnARtosales.

variables:	model (1)	model (2)	model (3)
lninfundstosales	-0.024*	-0.028*	-0.012
	(-1.67)	(-1.93)	(-0.67)
lnexfundstosales	0.317***		
	(10.93)		
lnAPtosales	0.232***	0.202***	0.191***
	(16.04)	(13.04)	(9.81)
Age	-0.103	-0.102	-0.094
	(-1.59)	(-1.53)	(-1.20)
Roa	-0.293	-0.243	-0.467*
	(-1.55)	(-1.22)	(-1.81)
Growth	-0.046***	-0.057***	-0.036**
	(-3.71)	(-4.50)	(-2.36)
Tangi	-0.319***	-0.462***	-0.476***
	(-3.96)	(-5.55)	(-4.65)
Lnsales	-0.030	-0.081**	0.024
	(-0.74)	(-2.09)	(0.48)
Size	0.113***	0.148***	0.006
	(3.01)	(4.23)	(0.13)
Leverage	0.116*	0.237***	0.300**
	(1.74)	(2.64)	(2.48)
lnbankloantosales		0.065***	
		(6.10)	
lnequitytosales		0.246***	0.306***
		(9.45)	(9.25)
lnlongtermdebtosales			-0.035***
			(-4.03)
lnshortermdebtosales			0.140***
			(11.23)
Constant	-2.400***	-1.929***	-1.054*
	(-5.87)	(-4.27)	(-1.81)
year	yes	yes	yes
Industry	yes	yes	yes
N	14959	13171	8606
r2_a	0.125	0.137	0.126
F	124.402	111.815	78.939

t statistics in parentheses

="* p<0.1 ** p<0.05 *** p<0.01"

4.2.2 Trade Credit, Finance Structure and Ownership

As the results showed in table 3. Trade credit is positively related to external funds, including equity funds, bank loan funds and credit received from firms' supplier. As for bank loans, trade credit is positive related to short-term loan, but negative to long-term loan. And almost all the coefficients of the independent variables of state-owned enterprises are much larger than those of the non-state-owned enterprises. The coefficient of *lnexfundstosales* is 0.019 for non-state-owned firms and the number is 0.288 for the state-owned firms. It indicates that as the amount of external funds increases 1%, state-owned firms would grant 0.098% more of trade credit than Non-state-owned firms. also, in model (3), controlled other situations, stated owned would grant more trade credit than non-state-owned firms as their accounts payable, equity finance and short-term loan increases.

Table 3. trade credit, finance structure and ownership the dependent variable is lnAPtosales.

Variables	model(1)	model(2)	model(3)	model(1)	model(2)	model(3)
		NSOE			SOE	
lninfundstosales	-0.007	-0.040	-0.070**	-0.039**	-0.021	-0.002
	(-0.31)	(-1.60)	(-2.07)	(-2.17)	(-1.17)	(-0.07)
lnexfundstosales	0.190***			0.288***		
	(4.24)			(7.41)		
lnAPtosales	0.233***	0.203***	0.139***	0.225***	0.203***	0.221***
	(10.38)	(8.18)	(4.19)	(11.99)	(10.23)	(9.37)
Age	-0.264**	-0.331***	-0.391**	0.031	0.066	0.056
	(-2.36)	(-2.82)	(-2.23)	(0.41)	(0.85)	(0.67)
Roa	0.278	0.620**	0.524	-0.823***	-0.974***	-1.240***
	(0.97)	(1.98)	(1.16)	(-3.39)	(-3.90)	(-4.07)
Growth	-0.031*	-0.057***	-0.020	-0.041**	-0.042**	-0.048**
	(-1.89)	(-3.24)	(-0.91)	(-2.36)	(-2.41)	(-2.41)
Tangi	-0.228	-0.294**	-0.401**	-0.316***	-0.516***	-0.403***
	(-1.63)	(-1.98)	(-2.01)	(-3.18)	(-5.06)	(-3.38)
Lnsales	-0.089	-0.175***	-0.161*	-0.127**	-0.068	0.002
	(-1.45)	(-2.92)	(-1.89)	(-2.30)	(-1.31)	(0.03)
Size	0.213***	0.254***	0.208**	0.134**	0.094**	-0.032
	(3.67)	(4.59)	(2.56)	(2.57)	(1.99)	(-0.55)
Leverage	-0.218**	-0.168	-0.432**	0.275***	0.473***	0.478***
	(-2.15)	(-1.23)	(-2.10)	(3.06)	(3.91)	(3.21)
lnbankloantosales		0.039**			0.057***	
		(2.39)			(4.14)	
lnequitytosales		0.139***	0.178***		0.287***	0.314***
		(3.42)	(3.24)		(8.25)	(7.63)
lnlongtermdebtosales			-0.039***			-0.025**
			(-2.65)			(-2.43)
lnshortermdebtosales			0.077***			0.137***
			(3.46)			(9.42)
year	yes	yes	yes	yes	yes	yes
Industry	yes	yes	yes	yes	yes	yes
Constant	-2.598***	-1.520*	0.896	-1.830***	-2.063***	-0.687
	(-3.79)	(-1.89)	(0.81)	(-2.91)	(-3.10)	(-0.88)
N	6691	5643	3281	8268	7528	5325
r2	0.264	0.282	0.277	0.303	0.306	0.344
F	41.169	36.774	19.903	78.750	70.443	57.527

t statistics in parentheses

* p<0.1 ** p<0.05 *** p<0.01

4.3 Robust Test

Robust test is done to make sure that the result is robust. I winsorized the sample in a 5%-95% level, the result is robust. And different groups are categorized by firm size and growth, the coefficient of the independent variable does not change in nature, so the results are robust.

5. Conclusion and Suggestion for Future Research

Using a sample of Chinese non-financial firms, I test the relationship between trade credit and finance structure and find that trade credit is positively related to external finance rather than internal fiancé. And equity finance and credit get from supplies play very significant role, and as for short-term loan and long-term loan, short-term loan is significantly positive with trace credit while long-term credit is negatively related to trade credit.

The usage of trade credit is a quite complex decision. This paper does not test the reason, profitability and risk for firms to transfer credit to the market. And that is also a goal for my future research.

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