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Determinants of Accounts Receivable: Evidence from Equipment Manufacturing Industry in China

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Abstract

In this paper, we study the determinants of accounts receivables in China's equipment manufacturing industry. The results show that the accounts receivable is strongly affected by financial leasing and short-term financing ability. In addition, the creditworthiness of the firm, internal financing and product quality also affect the level of accounts receivable.

Key Words: *financial leasing, accounts receivable, equipment manufacturing industry*
JEL Classification: *G31, G32*

1. Introduction

Accounts receivable is a kind of creditor's right for a company while selling products. As a fairly current asset in a company, accounts receivable is related to the turnover of the cash flow, and thus affect the firm's growth and development.

The competition among companies is fierce because of economic globalization and international economic integration. To compete with other firms, the firm has to exploit new market and make new sales policies. In China's production markets, especially in equipment manufacturing industry, overcapacity is a challenging problem. Under this circumstance, credit sales tools, such as financial leasing, are widely used to attract more customers and increase revenues. On one hand, financial leasing can enhance the competitiveness and boost profits for the company. On the other hand, it also brings some problems, like high accounts receivable (Shi, 2010). In recent literatures, Mian and Smith (1992) found that manufacturing firms in US had 21% of accounts receivable of total asset in 1986. In Belgian non-financial firms, the ratio was 16% in 1995 (Deloof and Jegers, 1999). However, there are few empirical evidence on accounts receivable using China's data. Considering this, we try to test the determinants of accounts receivable using data on listed companies in China's equipment manufacturing industry.

The rest of the paper proceeds as follows. In section 2, we review the relevant literature about the determinants of accounts receivable. In section 3, we describe the methodology, while section 4 reports the results of the research. We end with our conclusions in section 5.

2. Literature Review

The recent literatures offer many theories and empirical evidence explaining trade credit and determinants of accounts receivable. Emery (1984) found that if a firm was getting access to credit markets easily, it would use the borrowing capacity to help firms that had limited access to banks. In the equipment manufacturing industry, suppliers have an advantage over other lenders because of information asymmetries, for the reason that the suppliers can visit the buyers' premises than others. Besides, the suppliers had a better ability to investigate the creditworthiness of their customers (Peterson and Rajan, 1997). García-Teruel and Martínez-Solano (2010) tested whether the accounts receivable decisions followed a model of partial adjustment, and found that, in Spain, firm size, sales growth, capacity to generate internal funds and short term financing affected the accounts receivable. Khan et.al (2012) analyzed the determinants of accounts receivable in Pakistani listed companies, and found that the accounts receivable is strongly affected by the firm's incentive to use trade credit and firm size.

Deloof and Jegers (1996) found that there was a significant effect of group membership on the accounts receivable policy of Belgian firms. The author argued that the firm extended

trade credit to linked firms over longer period. When a firm lacked of money, investment in accounts receivable would be reduced. They also found that trade credit was an instrument of common financial management with Belgian companies, as indicated by Peterson and Rajan (1997). Eleonora (2013) investigated the relation between the accounts receivable with the data of Croatia in 2010, and found that the profitability has a positive impact on accounts receivable, i.e. an increase of profitability leads to an increase of level of accounts receivable.

Niskanen and Niskanen (2000) found that internal financing is a determinant of accounts receivable. As Niskanen and Niskanen (2000) discussed, firms with a better capacity to get internal funds have more resources available and offer more finance to their clients. Peterson and Rajan (1997) found that internal financing is significant but negative to accounts receivable.

In the existing literature, sales growth is another determinant. A firm willing to develop may choose a decision to expand trade credit with longer periods. Niskanen and Niskanen (2000) found that the coefficient with negative sales growth have a positive impact on accounts receivable, but negative with positive sales growth, implying that companies with higher growth rate expand less trade credit. The result is consistent with Peterson and Rajan (1997).

With regard to the determinant profit margin, it is always mentioned in literatures. Firms with a higher profit margin have a stronger incentive to generate more sales. The profits maybe come from commercial and financial activities. Peterson and Rajan (1997) found that firms with more marginal earnings have more interest in enhancing their sales, which is supported by (García-Teruel and Martínez-Solano, 2010).

As a kind of credit sales, financial leasing will affect the accounts receivable. The quantity of trade credit offered by a firm, is affected by a demand component (Peterson and Rajan, 1997).

3. Methodology

3.1 Variables

Here we describe the variables that are determining the level of accounts receivable. The dependent variable is AR, calculated as the logarithm of accounts receivable.

Financial leasing is a dummy variable in this study. It equals 1 when there exists financial lease receivables in the listed firm's annual report. Otherwise, it equals 0. Following by Peterson and Rajan (1997), firm size, ASSET, is calculated as the logarithm of total asset, and AGE is measured as logarithm of (1+age), where age represents the years since the foundation of the company. Short term financing, SF, is defined as the ratio of current liabilities to sales, as indicated in García-Teruel and Martínez-Solano (2010). Sales growth, RR, is defined as the annual growth rate of revenues. Internal financing, CF, is calculated as

operating cash flow divided by total asset, as pointed in Niskanen and Niskanen (2000). Followed by Khan et.al. (2012), price discrimination, MARGIN, is measured by the ratio of contribution margin to asset. Product quality, TURN, as indicated in García-Teruel and Martínez-Solano (2010), is calculated as the ratio of sales over asset minus accounts receivable. Macroeconomics factors, GDP, is defined as the Gross Domestic Product.

3.2 Data Description

In this research, the sample consists of financial accounting data of the firm in equipment manufacturing industry listed on Shanghai Stock Exchange and Shenzhen Stock Exchange. The data is collected from the WIND, a Chinese database. The sample period is from 2008 to 2014.

Table 1 shows the descriptive statistics of the variables. Generally, from the mean value, we can find that the financial leasing business is not very common in China's equipment manufacturing industry representing 2.76%. The sample firms generate a cash flow of 3.15% over total asset, and make contribution margin 4.56% over total asset. The average growth rate of revenue is 22.21%. In addition, they have a current liabilities over sales around 39.23%. Table 2 summarizes the correlations between variables.

Table 1: Summary Statistics

	Mean	Median	Std. Dev.	Min	Max
AR	8.8244	2.8282	24.6828	0	341.2081
LS	0.0276	0	0.1637	0	1
ASSET	21.5337	21.4019	1.1771	16.7037	26.7512
AGE	2.6846	2.7081	0.3388	0	3.6003
STF	0.3923	0.3377	1.1048	0.0060	56.0658
CF	0.0315	0.03192	0.07770	-1.9377	0.4711
MARGIN	0.04562	0.0413	0.3979	-5.2984	22.0051
RR	22.2066	11.6400	388.4427	-100.0000	25179.68
TURN	0.7866	0.68401	0.4876	0.0011	4.7445
PROF	3.0364	0.078739	202.5965	-264.5701	13357.55
GDP	50.1657	53.4123	10.5788	31.6752	63.5910

Table 2: Correlations between variables

	AR	LS	ASSET	AGE	STF	CF	MARGIN	RR	TURN	GDP
AR	1.0000									
LS	0.2893	1.0000								
ASSET	0.6128	0.2325	1.0000							
AGE	-0.0212	0.0291	0.1069	1.0000						
STF	0.0280	-0.0005	-0.0534	0.0665	1.0000					
CF	-0.0242	0.0047	0.0542	0.0122	-0.0302	1.0000				
MARGIN	-0.0052	0.0016	-0.0237	-0.0025	-0.2207	0.0777	1.0000			
RR	-0.0057	-0.0024	-0.0153	0.0015	-0.0024	0.0026	0.0014	1.0000		
TURN	0.1235	0.0097	0.1789	0.1388	0.0724	0.0626	0.0009	-0.0089	1.0000	
GDP	0.0885	0.0581	0.1258	0.2408	-0.0663	-0.0512	0.0025	-0.0287	-0.1241	1.0000

4. Results

In this part, we regress accounts receivable on variables that are thought to be their determinants mentioned before. Table 3 shows the empirical results.

The coefficient of LS is significant and positive at the 1% level, indicating that the more financial leasing business does a firm uses to sell product, the more accounts receivable it has. This can be explained as meaning that when financial leasing is used in the firm, the supplier offered more credit.

The coefficient of ASSET and AGE are positive and significant at the 1% level. In general, larger firms are more creditworthy than smaller one. Also older firms can provide more credit to their clients. The results supported the ideas of Peterson and Rajan (1997) in which they found larger firms often have higher accounts receivables.

The short term financing has a positive and significant impact on accounts receivable at the 1% level, indicating that when the firm has a better capacity of short term financing, it will have a high accounts receivable. This can be explained by that a firm may offer longer credit period when they have more short term funds. The result supports the arguments in García-Teruel and Martínez-Solano (2010).

The coefficient of variable CF is negative and significant at the 1% level. The result is unexpected and difficult to explain, when a firm has a stronger internal financing, it will have a lower accounts receivable. The possible interpretation is that firms in trouble will expand more credit sales to keep sale revenues, as pointed in Peterson and Rajan (1997).

It is reported that the price discrimination has a positive and significant impact on accounts receivable at the 5% level, meaning that the more price discrimination, the higher accounts receivable the firm has.

From the table, we also know that the coefficient of sales growth is positive but insignificant. This can be interpreted by that the growth does not affect the accounts receivable. It is consistent with Khan et.al (2012).

The variable product quality has a positive and significant impact on accounts receivable at the 1% level. As Lee and Stowe (1993) discussed, trade credit is a best way to guarantee product. This result can be explained by the fact that firms with higher product quality will offer more trade credit and get higher accounts receivable (García-Teruel and Martínez-Solano, 2010).

The variable Gross Domestic Product has a significant and negative impact on accounts receivable at the 1% level, which means that when the macroeconomic condition is bad, the accounts receivable will be higher. This is because that under bad macroeconomic conditions, firms may generate less cash flow than before, and thus the period of accounts receivable will increase (García-Teruel and Martínez-Solano, 2010).

Table 3

	AR
LS	14.92***
	(9.48)
ASSET	8.568***
	(14.99)
AGE	36.16***
	(9.83)
STF	0.790***
	(3.22)
CF	-10.58***
	(-4.03)
MARGIN	1.023**
	(2.04)
RR	0.000371
	(0.83)
TURN	3.097***
	(3.90)
GDP	-0.333***
	(-6.73)
_cons	-259.2***
	(-19.04)
N	4334

5. Conclusion

In this study, we examine the determinants of accounts receivable in listed companies form China's equipment manufacturing industry. One of the key motivations for suppliers to use financial leasing is to increase sales, as indicated in previous literatures. This research shows the financial leasing will lead to higher accounts receivable. Furthermore, the accounts receivable is affected by creditworthiness of a firm, i.e. firm size and firm age. Besides, product quality, internal financing ability and price discrimination are also determinants of accounts receivable. To conclude, the results of the empirical study are different form earlier literatures in some aspects, because there are too many differences between Chinese stock market and others. This result also suggests that there exists heterogeneity of firms while studying the problems.

Our work contributes to the literatures of determinants of accounts receivable, which makes us know the importance of accounts receivable. One of the most important works for future study is to examine the risk of accounts receivable, because high accounts receivable is

a challenging problem for a company. Detailed data and appropriate mathematical model will allow experts to measure the risk and try to reduce it.

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