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The capital structure determinants of Chinese listed SMEs

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ABSTRACT

The main objective of this paper is to study the capital structure determinants and their indebtedness level in Chinese listed SMEs. In addition to total debts, this study also analyzes the different impacts on short-term and long-term debts. The hypotheses base on two main theories, pecking order theory, and trade-off theory. As the results show, the pecking order theory is more suitable for Chinese firms. The results conclude that profitability, operating risk and firm size are determinants of capital structure in Chinese SMEs, while asset tangibility has no significant impact on indebtedness. This study also considers the characteristics of the Chinese economy. Because of the size limitation and private ownership, SMEs have difficulties in obtaining external capital from financial institutions, which affects the capital structure choice in companies.

Key words: Capital structure; SMEs; China capital market

JEL Classification: G32

I. INTRODUCTION

This paper documents the determinants of capital structure in Chinese listed SMEs and study the effects of the determinants on indebtedness levels. Based on the previous pieces of literature, this study proposes several testable hypotheses to examine the determinants of capital structure in Chinese SMEs. In addition to total indebtedness, this study also considers the impact of the maturity structure of debt, which consisting of short-term and long-term indebtedness.

The capital structure choice is one of the most important financial decision for a firm. Most empirical studies focus on large-sized enterprises when they analyze the capital structure determinants of firms. However, with the development of the economy, small and medium enterprises (SMEs) have become the engine of growth in most local economies. They provide employment for local people, promote local economic activities and offer well-being for communities. Furthermore, SMEs play an important role in the global economy. The strategy selection and innovation promotion will strengthen the influence of SMEs. Thus, studying the industry characteristics for small firms is particularly important for capital structure choice in SMEs. For most SMEs, one of the main problems during operation is how to finance their activities. The current economic environment also affects the capital structure choice in SMEs, and China has some characteristics with its economic and politic system which is influential to the development of Chinese firms.

China is in transition from a command economy to a market economy. During this period, private SMEs have become one of the most important business sectors and been regarded as

the backbone in the Chinese economy. However, for Chinese SMEs, the difficulty for them to obtain financing capital from external funding sources is a particularly serious issue, which will influence their capital structure choice. Financing activities in SMEs largely depend on obtaining debts from banks. Because of the size limitation and private ownership, compared to larger companies, SMEs have to face the more serious lending requirements from banks when obtaining external capitals. The Chinese government implemented some policies to support the development of SMEs, but the effect of policies was not achieved as expected. Although facing the serious situation of SMEs in China, there are only limited amounts of studies that focus on Chinese SMEs. Most empirical studies in China mainly focus on the capital structure of LSEs or SMEs in developed countries, which are not suitable for Chinese SMEs. Therefore, the capital structure choice of SMEs remains one of the most under-researched areas in China. As the largest developing country and the second-largest economy in the world, Chinese companies have some firm characteristics which differ from other developed countries (Huang & Song, 2005). It is important to study the determinant factors of capital structure and analyze the impacts on the indebtedness level of Chinese SMEs.

Based on the review of previous studies, this study focus on profitability, assets tangibility, operating risk, and firm size as the main related determinants of capital structure in Chinese SMEs. This paper uses the data collected from the China Stock Market and Accounting Research Database (CSMAR) and employs the panel data analysis. Our findings can be summarized as follows. Firstly, Chinese SMEs are generally consistent with the pecking-order theory, which having less portion of capital is funded from debt. For the maturity structure of

debt, Chinese Listed SMEs have much more short-term debt than long-term debt. Because of the difficulties in obtaining long-term loans from the bank in China, Chinese SMEs have to rely more on short-term debts as their external financing when the internal capital is insufficient. Furthermore, profitability in Chinese listed SMEs is lower, because small firms are more vulnerable to market fluctuations and affected by the economic environment. SMEs have less tangible assets, which affect their profitability and indebtedness structure. The sample in the study is listed SMEs, so firm size is much larger than the expected but it is still relatively small.

Secondly, the empirical results show that the capital structure determinants in Chinese SMEs are not completely consistent with the theories. There is a negative relationship between profitability and indebtedness, which indicates that firms use the profit to reduce the debt level due to their more dependency on internal capitals than external debt (Degryse, Goeij, & Kappert, 2012). This paper also documents the impacts of profitability on short-term and long-term debts. For Chinese SMEs, when internal funds are insufficient, they will use more short-term than long-term debts to finance capitals. According to the regression results, asset tangibility will not influence the total debts, which are inconsistent with the theories. Considering the characteristics in the Chinese market, the serious collateral requirements from financial institutions block some firms from obtaining loans. After analyzing the maturity structure of total debts, I find that firms with more collateral attract long-term debts more easily. Chinese SMEs with more tangible assets are more able to borrow long-term debts because of the collateral requirements. However, for operating risk, the conclusions contradict the two theories, but they are in line with the previous study of Pacheco and Tavares (2015) that SMEs

with higher risk continue to finance capital through external lenders in order to avoid bankruptcy. In addition, the larger firms rely more on debts, but for smaller firms, they will decrease their dependency on external debts in financing for reducing financial risk.

The findings have some contributions to the study of capital structure determinants in Chinese SMEs. This paper provides more literature supports for capital structure choice in the management of Chinese SMEs. The research objectives in many previous studies are mostly LSEs in developed countries or SMEs in other developing countries. There are only a few research papers study the capital structure determinants of Chinese firms. With the development of the Chinese economy, China has become a particularly important part of the global economic system. Besides, because most of the literature in China mainly focus on the capital structure in LSEs, this paper extends the literature by analyzing not only the determinants of total debts but also the short-term and long-term indebtedness in Chinese listed companies.

The remainder of this paper is organized as follows. Section 2 presents a literature review on capital structure and formulates several testable hypotheses of capital structure determinants. Section 3 describes the regression methodology and the variables. Section 4 presents the empirical results. In this section, after testing the hypotheses, the results are concluded in three tables, including descriptive statistics, correlation matrix, and regression results. Section 5 summarizes the main conclusions of the research, discusses examination results and develops expectations for future research.

II. LITERATURE REVIEW AND HYPOTHESES

Capital Structure Theories

From the currently available works of literature, there are several theories explain the capital structure. The pecking order and trade-off theories are two main theories that support the capital structure determinants. The pecking order theory considers a sequence of financing decisions based on information asymmetry between managers and investors (Myers, 1984). Firms prefer to use funding sources with lower information asymmetry, because incomplete information may cause additional borrowing costs when obtaining funds from outside lenders (Degryse, Goeij, & Kappert, 2012). As the theory mentions, firms will first use retained earnings to finance investments, then make use of debt financing when retained earnings are inadequate, and finally uses equity issuance as the last resort (Pacheco & Tavares, 2015).

The second theory is the trade-off theory. The trade-off theory develops two main aspects, tax effect and agency cost theory. For the tax effect on capital structure choice in firms, when firms take advantage of tax shields by increasing debts, not only tax benefits but also the possibility of financial difficulties increases (Pacheco & Tavares, 2015). The financial difficulties will cause additional cost such as bankruptcy costs in the operation of firms. The agency cost refers to the cost resulted from conflicts of interest between shareholders and managers or creditors and shareholders. The company should compare interests from debts and the effect of agency costs when managing the capital structure in order to maximize the firm value (Pacheco & Tavares, 2015).

Predictions of Capital Structure Determinants

Previously empirical studies show that profitability, tangibility, firm size, risk, growth opportunities will affect the capital structure of the company. According to the recent studies from Portuguese firms by Pacheco and Tavares (2015), their prediction is that indebtedness increases with assets tangibility, growth, size and decreases with profitability, total liquidity, risk. The studies from Hussain, Millman, and Matlay (2006) state that assets tangibility is necessary for the Chinese firm as collateral. Wald (1999) claims that profitability has the largest single effect on debt to asset ratios. Based on those literatures, this study will focus on SMEs' profitability, assets tangibility, operating risk, and firm size as the main related determinants of capital structure.

Profitability: Profitability is one of the determinants of capital structure. The expected relationship between profitability and capital structure is founded on the pecking order hypothesis of Myers (1984). According to the pecking order theory, the firms will give priority to internally generated funds, then external debt. The more profitable firms will have better conditions in internal financing and reduce the necessity to raise debt (Myers, 1984; Myers & Majluf, 1984). There are some previous studies on SMEs that also find a negative relationship between profitability and debt (Pacheco & Tavares, 2015; Degryse et al., 2012). Furthermore, Pettit and Singer (1985) argue that SMEs may have higher costs of external financing than larger firms. Based on the above literature, our hypothesis regarding profitability is:

H1: Profitability has a negative impact on indebtedness.

Profitability also affects short-term and long-term indebtedness in firms' capital structure choice. The results in the study of Pacheco and Tavares (2015) shows that profitability is negatively related to short-term and long-term debt. In addition, another study also points out that profitability has a greater negative impact on short-term indebtedness than on long-term indebtedness (Degryse, Goeij, & Kappert, 2012). Those studies argue that SMEs use short-term debt more than long-term debt to finance capital when the internal funding is unavailable for them, which supporting the preference of SMEs to the current liability. Therefore, hypothesis 1 is supplemented as follows:

H1.a: Profitability has a negative impact on short-term debt.

H1.b: Profitability has a negative impact on long-term debt.

Assets tangibility: Asset tangibility is a second factor that determining capital structure in firms. Theories generally suggest that assets tangibility is positively related to capital structure. Tangible assets act as collateral when the firm enters into bankruptcy, so the more tangible assets exist lead to greater indebtedness level (Pacheco & Tavares, 2015). According to the trade-off theory, the existence of tangible assets reduce the agency cost of the firm (Degryse, Goeij, & Kappert, 2012). If a firm has tangible assets, these assets can be used as collaterals to obtain loans, reducing the risk of the lender from suffering such agency costs of debt. In addition, the firms with collaterals make investors more willing to finance the investment and reduce the agency cost of debt (Hussain, Millman, & Matlay, 2006). Compared with the larger firms, SME companies face more difficulties in financing capitals. In China, almost all SMEs are required to provide collateral to the bank for loans, especially fixed assets collateral. If the

firms have higher value in the assets collateral, they are easier to get access to financing capital from financial institutions. Therefore, our next hypothesis regarding asset tangibility is:

H2: Assets tangibility has a positive impact on indebtedness.

Tangible assets affect short and long-term indebtedness differently, previous studies document a negative relationship for short-term debt and a positive relationship for long-term debt (Hall et al., 2000; Degryse et al., 2012). Firms with more collateral are able to borrow long-term debts more easily. Those firms prefer long-term debts with less financial risk and a more stable interest rate. Based on those studies, I supplement the hypothesis 2 with:

H2.a. Assets tangibility has a negative impact on short-term debt.

H2.b. Assets tangibility has a positive impact on long-term debt.

Operating risk: Operating risk is another determinant of firms' capital structure. Although some of the empirical studies use "risk" as the determinant, the definition of risk is too broad. Thus, our study will focus on the operating risk in Chinese Listed SMEs. In the empirical study of Pacheco and Tavares (2015), they suggest that there is a negative relationship between risk and indebtedness. Because of the dimension, economic environment and innovation requirement for industry development, SMEs are facing higher business risk. Both of trade-off theory and pecking order theory support the hypothesized relation between operating risk and indebtedness. According to the trade-off theory, operating risk has negative impact on debt. In order to benefit from the tax deduction, firms will increase their external debts. However, at the same time, the probability of financial difficulties also increases with more debts, which

will cause additional costs and influence the firms' operation. The pecking order theory also supports a negative relationship between operating risk and indebtedness. The firms with higher risk will result in lower financial capital in operation because high risk also reduces the capacity of financing and increases the cost of bankruptcy (Frank & Goyal, 2009; Myers, 1984).

Because of the difficulties in estimating the costs of financial failure, the parameters of measuring the operating risk is hard to be defined in the study. Due to the uncertain parameters, some empirical studies show different results for the relationship between risk and indebtedness. There are different indicators used to measure the variable of operating risk in previous studies. As Pacheco and Tavares (2015) mention in their research paper, the risk of a firm can be generally defined as "the level of uncertainty in its future". Based on those researches, this study will use the solvency ratio (SOR) to measure the firms' ability of capital financing and debt management (Pacheco & Tavares, 2015). The solvency ratio is a measure to assess a firm's ability to meet debt obligations. The lower solvency ratio means the greater probability that it will default on its debt obligations, and the higher risk in operation. The SOR should have a value greater than or equal to one and should not have values lower than 0.5. According to the theories, if the relationship between operating risk and capital structure is predicted as negative, the SOR should be positively related to the capital structure.

H3: Solvency ratio has a positive impact on indebtedness.

As the previous studies show, operating risk affects short-term and long-term debts differently (Pacheco & Tavares, 2015). Although there is a negative relationship between long-

term debt and risk, short-term debt presents a positive one, which indicates that companies with higher risk in operation rely more on short-term debts than long-term debts. Considering the small size and lower level of risk control in SMEs, long-term debt will increase the risk of bankruptcy. Because the solvency ratio is inverse to risk level, hypothesis 3 will be supplemented with:

H3.a. Solvency ratio has a negative impact on short-term debt.

H3.b. Solvency ratio has a positive impact on long-term debt.

Firm size: Firm size also determines the capital structure choice of firms. The theories argue that there is a positive relationship between firm size and indebtedness. According to the trade-off theory, because size is assumed to measure earnings volatility, firm size is considered to be inverse to bankruptcy costs (Degryse, Goeij, & Kappert, 2012). Larger firms have less volatile earnings, which reducing indirect bankruptcy cost so that firms can take on more debts. According to the pecking order theory, more diversification mitigates the problems of asymmetric information (Pacheco & Tavares, 2015). Larger firms are generally more diversified and tend to have more stable stakeholders and easier access to capital markets. However, for SMEs, their obtainable capital is limited by smaller size and asymmetric information. Due to the higher information asymmetry between managers and potential investors, small firms face more difficulties in accessing loans from the capital market (Pacheco & Tavares, 2015). Empirical studies, such as Rajan and Zingales (1995), Degryse et al., (2012) also suggest that financial leverage is positively related to firm size.

H4: Firm size has a positive impact on indebtedness.

According to some previous studies of firm size, size can affect long and short-term financing differently. On the one hand, Hall et al. (2000) report that larger firms have smaller risk, lower probability of bankruptcy and fewer costs in financing capital. Thus, they have more incentive and easier access to borrowing long-term debts from external funding sources. On the other hand, for short-term debts in SMEs, their studies show that there is a negative relation between size and short-term indebtedness. Comparing to larger companies, small firms rely more on short-term debts when their internal capital is insufficient and have to borrow external debts (Pacheco & Tavares, 2015). Some studies with the same results also suggest that SMEs prefer short-term debts with less transaction costs than long-term debts (Degryse, Goeij, & Kappert, 2012). Based on the above studies, the paper supplements the hypothesis 4 with:

H4.a. Firm size has a negative impact on short-term debt.

H4.b. Firm size has a positive impact on long-term debt.

III. METHODOLOGY

Based on the studies of Pacheco and Tavares (2015), this study uses panel data analysis and performs the following three models:

$$TD_{i,t} = \beta_1 + \beta_2 ROA_{i,t} + \beta_3 AT_{i,t} + \beta_4 SOR_{i,t} + \beta_5 SZ_{i,t} + \varepsilon_{i,t}$$

$$STD_{i,t} = \beta_1 + \beta_2 ROA_{i,t} + \beta_3 AT_{i,t} + \beta_4 SOR_{i,t} + \beta_5 SZ_{i,t} + \varepsilon_{i,t}$$

$$LTD_{i,t} = \beta_1 + \beta_2 ROA_{i,t} + \beta_3 AT_{i,t} + \beta_4 SOR_{i,t} + \beta_5 SZ_{i,t} + \varepsilon_{i,t}$$

Where:

- β = the coefficient to estimate
- $TD_{i,t}$ = Total Debt Ratio for firm i in year t
- $STD_{i,t}$ = Short-term Debt Ratio for firm i in year t
- $LTD_{i,t}$ = Long-term Debt Ratio for firm i in year t
- $ROA_{i,t}$ = Net Income divided by Total Assets for firm i in year t
- $AT_{i,t}$ = Non-current Assets divided by Total Assets for firm i in year t
- $SOR_{i,t}$ = Total Equity divided by Total Liabilities for firm i in year t
- $SZ_{i,t}$ = the Logarithm of total assets for firm i in year t
- $\varepsilon_{i,t}$ = the error describing the non-explained effects on dependent variables.

There are different measures of capital structure in financial analysis, where the total debt ratio, short-term debt ratio, and long-term debt ratio are the main dependent variables. The total debt ratio is calculated as total debts divided by total assets, which is used as the main measure of capital structure. With regard to the maturity structure, the short-term debt ratio is calculated as short-term debts divided by total assets, and long-term is calculated as long-term debts divided by total assets.

For empirical research, this study also determines four independent variables: return on assets, asset tangibility, solvency ratio, and firm size. The independent variables are determinant factors of firms' capital structure and used in order to test the hypotheses. Firstly, return on asset is used to measure the profitability of firms, and the expected sign is negative for the relationship between total, short-term, and long-term indebtedness. The second

hypothesis is about asset tangibility, which measures the portion of tangible assets owned by firms. The expected sign with total and long-term indebtedness is all positive, while the one with short-term indebtedness is negative. Thirdly, operating risk is measured by the solvency ratio (SOR). The hypothesized sign with total and long-term indebtedness is all positive, while the one with short-term indebtedness is negative. Finally, the logarithm of total assets is used to measure firm size, which is positively related to total and long-term indebtedness and negatively related to the short-term one.

IV. EMPIRICAL RESULTS

Data Collection

All the data used in this study is gathered from the China Stock Market and Accounting Research Database (CSMAR). According to the criteria for the listed SMEs, the firms with less than ten or more than 300 employees are excluded from this study. Financial companies are also excluded in the sample because these companies have their specific financial behavior and own capital structure which differing from other industries. Besides, because of the special treatment scheme from the Chinese Securities Regulatory Commission, firms that having experienced operational losses for two consecutive years are not included in the sample. Therefore, a final sample of 872 SMEs of Chinese Listed SMEs are available for the analysis.

The earliest fiscal year of Chinese Listed SMEs is on March 31, 2004, and the available data in CSMAR is limited by May 30, 2017. The CSMAR database provides quarterly data in which includes four quarters of data on March 31, June 30, September 30, and December 30

for each year from 2004 to 2017. In this study, we only select the data on December 30 for each year in which covers the financial situation of a company for the whole year. Because of a lack of data, so the data in 2017 is not included in the analysis. In order to reduce errors, we also remove all entries with data errors and observations with extreme values. Based on the chosen samples and the criteria in the database, we finally select the data from Balance Sheets and Income Statement in the period from 2004 to 2016, which is unbalanced data. Our final data contains 3082 fiscal-year observations.

Table Results

Table 1 reports the statistical results of the dependent variables. Chinese Listed SMEs have an average debt ratio of 43.03 percent, with a large variety which ranging from a maximum of 286.10 percent to a minimum of 3.32 percent. The average percentage of debt ratio shows that Chinese SMEs have less portion of capital is funded from debt. In addition to total debt ratio, there are also short-term debt ratio with the mean of 34.64 percent and long-term debt ratio with the mean of 7.17 percent. The results indicate that Chinese listed SMEs have much more short-term debt than long-term debt, which are consistent with the previous study (Hall, Hutchinson, & Michaelas, 2000). This attests that Chinese Listed SMEs rely more on short-term loans to finance capitals because of the difficulties in obtaining long-term loans from the bank.

Table 1 also provides descriptive statistics of independent variables in the regression model: profitability (ROA), asset tangibility, solvency ratio, and firm size. Return on assets has an average value of 4.37 percent with a maximum of 38.97 percent, which means that most

Chinese SMEs generally have lower profitability. The mean value of asset tangibility is 24.69 percent, which shows that Chinese SMEs in the sample has less tangible assets. The average value of the solvency ratio is 206.15 percent, which is greater than one. Chinese Listed SMEs have lower risk in the operation and lower probability of defaulting on a debt obligation. Firm size has an average value of 21.6845 with a maximum of 25.7069, which means that Chinese Listed SMEs have larger firm sizes.

Table 1 Descriptive Statistics

Variables	Obs	Mean	SD	Median	Min	Max
TDR	3082	0.4303	0.1841	0.4261	0.0332	2.8610
STD	3082	0.3464	0.1633	0.3378	0.0128	1.8556
LTD	3082	0.0717	0.0851	0.0427	0.0000	0.8917
roa	3082	0.0437	0.0627	0.0429	-2.0084	0.3897
at	3082	0.2469	0.1469	0.2313	0.0002	0.9480
sor	3082	2.0615	2.3416	1.3469	-0.6505	29.1008
sz	3082	21.6845	0.9771	21.6107	19.1682	25.7069

Note: TDR, total debt ratio; STD, short-term debt ratio; LTD, long-term debt ratio; roa, return on assets; at, asset tangibility; sor, solvency ratio; sz, firm size.

Table 2 shows the correlation between dependent and independent variables. There is a large correlation between total debt and short-term debt, which has a coefficient of 0.8862 because Chinese SMEs have a large portion of short-term debt in the total debt. According to the table, most of the correlation between variables are highly significant except asset tangibility and short-term debt ratio.

In addition, table 2 also shows the correlation between independent variables. For the variable of return on assets, the coefficient between return on assets and asset tangibility is -0.1607 and their relationship is highly significant. Return on assets is highly significantly related to the solvency ratio with a coefficient of 0.4371. There is also a highly significant

relationship between return on assets and firm size with a coefficient of -0.1461. For the variable of asset tangibility, asset tangibility is highly significantly related to the solvency ratio, which has a coefficient of -0.0814. The relationship between asset tangibility and firm size is also highly significant and their coefficient is -0.1064. For the variable of solvency ratio, there is a highly significant relationship between solvency ratio and firm size with a coefficient of -0.4014.

Table 2 Correlation Matrix between Dependent and Independent Variables

	TDR	STD	LT	roa	at	sor	sz
TDR	1						
STD	0.8862***	1					
LTD	0.5211***	0.2104***	1				
roa	-0.4372***	-0.3519***	-0.2682***	1			
at	0.0814***	0.0291	0.0716***	-0.1607***	1		
sor	-0.9996***	-0.8857***	-0.5209***	0.4371***	-0.0814***	1	
sz	0.4016***	0.2851***	0.6540***	-0.1461***	-0.1064***	-0.4014***	1

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

Note: TDR, total debt ratio; STD, short-term debt ratio; LTD, long-term debt ratio; roa, return on assets; at, asset tangibility; sor, solvency ratio; sz, firm size.

Table 3 presents the results of regression model. Based on the table, there is a highly significant negative relationship between return on assets and total debt with a coefficient of -0.848 and t-value of -7.766, which is consistent with the hypothesis. Some previous studies also found a negative relationship between profitability and indebtedness (Pacheco & Tavares, 2015; Degryse et al., 2012). If a firm can generate profits, the debt level becomes lower. The mentioned results is in line with the pecking order theory, which suggests that the more profitable firms will use internal funds as preferred. The main reason is that firms want to stay in control and avoid debt so that they can reduce the operating risk (Degryse, Goeij, & Kappert,

2012). For the relationships with short-term and long-term debt ratios, the results also present an expected negative sign and highly significant.

The empirical results show that the observed relation between asset tangibility and total debt is not statistically significant, which is similar to the results in the study of Pacheco and Tavares (2015). The relationship between asset tangibility and short-term debt ratio is highly significant and negative with the coefficient value of -0.117 and a t-value of -7.157. The result with a long-term debt ratio shows a highly significant positive relationship which has a coefficient of 0.103 and a t-value of 5.781. These results confirm the hypothesis that Chinese SMEs with more tangible assets are more able to borrow long-term debts because of the collateral requirements for SMEs to obtain loans.

As the results show in table 3, the coefficients for solvency ratio in the total debt, short-term debt, and long-term debt regressions are all negative, statistically highly significant, and economically relevant. Therefore, the hypotheses of H3 and H3.b should be rejected. In conclusion, risk is positively related to capital structure. Although the conclusions contradict the two theories, they are consistent with the previous study of Pacheco and Tavares (2015). The results indicate that Chinese SMEs with higher risk may borrow more debts to help themselves go through the current financial difficulties and reduce the possibility of bankruptcy. As Pacheco and Tavares (2015) explain in their paper, the high-risk firms have more reduced agency costs than the estimated increase in bankruptcy costs.

According to the regression results, the coefficients for size variable in the total debt, short-term debt, and long-term debt regressions are all positive, statistically highly significant,

and economically relevant. The hypothesis H4.a should be rejected, which expecting that firm size is negatively related to short-term debts. The results show that larger firms rely on both long-term financing and short-term financing, but for firms with smaller size and weaker risk control, they will decrease their dependency on external debts in financing. The results with total debt and long-term debt are in line with previous studies (Degryse, Goeij, & Kappert, 2012).

Table 3 Regression Model

	(1) TD	(2) STD	(3) LTD
ROA	-0.848*** (-7.766)	-0.581*** (-9.621)	-0.253*** (-5.295)
Asset tangibility	-0.012 (-0.860)	-0.117*** (-7.157)	0.103*** (5.781)
Solvency ratio	-0.048*** (-14.931)	-0.042*** (-15.035)	-0.007*** (-10.638)
Size	0.044*** (17.034)	0.020*** (7.614)	0.022*** (12.154)
Constant	-0.374*** (-6.203)	0.061 (1.024)	-0.400*** (-9.679)
Fiscal Year	Yes	Yes	Yes
Industry	Yes	Yes	Yes
Observations	3,082	3,082	3,082
R-squared	0.670	0.506	0.217
Adj. R-sq	0.669	0.505	0.216

Note: TDR, total debt ratio; STD, short-term debt ratio; LTD, long-term debt ratio.

As the regression table shows, the fixed effects of fiscal year and industry characteristic are included in the empirical results. There are total 3082 observations in our study. In the total debt regression model, the value of R-squared is 0.670, which indicates that the model can explain 67 percent of the variability of the response data around its mean. Thus, total debt model fits our data. The value of the R-squared in short-term debt regression is 0.506, which

means that the model explains 50.6 percent of the variability of the response data around its mean, so the short-term debt model fits the data. In the long-term debt regression model, the value of the R-squared is 0.217, which means that the model explains 21.7 percent of the variability for the response data around its mean. Although the R-squared is low, we have statistically significant predictors in regression results. Thus, the conclusions can be summarized as follows.

V. DISCUSSIONS AND CONCLUSIONS

In this study, I explore and analyze the capital structure determinants in Chinese listed SMEs. Some previous studies hold that capital structure choice of companies can be explained mainly by pecking order theory and trade-off theory. Based on previous literature, I use profitability, assets tangibility, operating risk and firm size as four determinant factors of capital structure in Chinese SMEs. Besides, I also analyze the impacts of variables on capital structure in the study by testing the relationships with total debt, long-term debt, and short-term debt. The study constructs a sample of 872 firms and 3082 observations of the Chinese listed SMEs, which obtained from the CSMAR database for a period from 2004 to 2016. In this study, I use a panel data model to test the hypotheses and analyze the results.

As the results show in the descriptive statistics of variables, Chinese SMEs have less portion of capitals that are funded from debt. The results attest that Chinese listed SMEs rely more on short-term loans to finance capitals. Because Chinese banks require firms to provide collateral for long-term debts, SMEs with small size and less tangible assets have difficulties in obtaining long-term loans from financial institutions. Otherwise, compared to long-term debts,

short-term debt is more flexible for firms to manage their capital structure. SMEs are very vulnerable to the economic environment, so a more flexible capital structure is conducive to the firms to respond to market changes. Most of the Chinese listed SMEs generally have lower profitability, less tangible assets, lower risk in the operation and relatively larger firm size.

Firstly, according to the empirical results, profitability, operating risk and firm size are key factors that affect the capital structure in Chinese listed SMEs, while asset tangibility is not significantly related to indebtedness. Profitability shows a negative relationship with total indebtedness, short-term indebtedness, and long-term indebtedness, which validate the pecking order theory. The theory suggests that the more profitable firms prefer using the profit to reduce their debt level since internal capital is less risky than external debt.

Secondly, although as the result shows that there is no expected relationship between asset tangibility and indebtedness, the relationship between asset tangibility and short-term debt ratio is significantly negative, and with long-term debt, the ratio is significantly positive. These results confirm the fact that Chinese SMEs with more tangible assets are more able to attract more long-term debts since collateral can mitigate the risk of SMEs. Besides, in China, financial institutions require firms to provide collateral for borrowing debts, so tangible asset is very important for Chinese SMEs.

Thirdly, in terms of risk, according to the empirical results, the total indebtedness of Chinese listed SMEs is associated with their operating risk. However, the signs are contrary to the hypotheses from both of the pecking order theory and trade-off theory, suggesting that Chinese SMEs with higher risk may borrow more debts to help themselves go through the

current financial difficulties and reduce the losses from possible bankruptcy. Nevertheless, there is a positive relationship between operating risk and long-term indebtedness. The result is in accordance with the trade-off theory because SMEs face an unstable market economy and experience more financing needs.

Finally, for the variable of firm size, the relationship with total indebtedness, short-term indebtedness, and long-term indebtedness are all significantly positive. The results show that larger firms with more stable stakeholders and easier access to capital markets rely more on debts. The larger firms which having more aware of better financing method will employ more financial staffs who can strengthen their bargaining power towards lenders (Degryse, Goeij, & Kappert, 2012). On the contrary, for smaller firms with weaker risk control, they will decrease their dependency on external debts in financing.

This research has some limitations. Firstly, due to a lack of data in CSMAR, this study only focuses on the listed SMEs in China. With the development of the economy, there are more unlisted SMEs, which become an important part of the Chinese economy. Chinese unlisted SMEs are also a vital objective in capital structure study. They are different from listed SMEs, so separate analysis is necessary for unlisted SME studies. Secondly, this study need more comparative data in the regression analysis, such as the differences between SMEs and LSEs in China, or the comparison between Chinese SMEs and foreign SMEs, which will be more conducive to firm analysis. Finally, this paper covers only four determinant factors of capital structure in Chinese SMEs, due to the complexity and mutual effects in economic market, the possible influential factors for capital structure choice are not limited to four.

The findings in the study provide some thoughts to characterize the capital structure in Chinese listed SMEs. However, based on the above limitations, there are some expectations for further research. Further research should, (i) add unlisted SMEs data to the capital structure study and compare the differences between listed SMEs and unlisted SMEs; (ii) add large size enterprise to the capital structure study and compare with SMEs; (iii) distinguish the sample with micro, small and medium sizes, then analyze and compare with different firm sizes, the more detailed investigation of firm sizes is left for future research; (iv) further research should explore more possible determinant factors in addition to profitability, asset tangibility, operating risk, and firm size. We expect further research will contribute to find more determinants in Chinese SMEs' capital structure and add comparative research in Chinese firms.

In summary, based on the results of this study, the pecking order theory and trade-off theory are not able to explain all of the capital structure determinants in Chinese listed SMEs. Compared to the trade-off theory, I find that pecking order theory is more suited to the study of capital structure in Chinese SMEs. However, the two theories are mutually influential, both of them are necessary for the research.

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