温州肯恩大学
WENZHOU-KEAN UNIVERSITY

The capital structure determinants of Chinese listed companies in Shanghai Stock Exchange

In Partial Fulfillment of the Requirements

for the Bachelor of Science in Finance

by

DONG Yixian

1025593

May, 2020

The capital structure determinants of Chinese listed companies in Shanghai Stock Exchange

Dong Yixian

Abstract

Capital structure is found important to the performance of a company's performance. Lots of studies focus on the determinants of companies' company structure in developed western countries such as America and the UK. This paper focus on the capital structure determinants of companies in China which are listed on the Shanghai Stock exchange. The possible determinants that were researched in this paper included company size, growth opportunity, risk profitability and liquidity. Whether the influence of these determinants is positive or negative was analyzed in this paper. Financial leverage(D/E ratio) was chosen as the main index to describe the companies' capital structure. According to the previous research in other countries, company size has a positive relationship with capital structure and other determinants has negative relationship. This paper collected data of companies listed on Shanghai Stock Exchange and analyze whether these relationships are same in China.

Table of Content

Introduction……..1

Literature Review…….4

Trade-off theory and pecking order theory

Company Size

Growth Opportunity

Risk

Profitability

Liquidity

Uncertain influence of determinants

Chinese capital structure determinants

Methodology……9

Hypothesis

Model

Data

Data Analysis method

Results……12

Data description

Crosstab

SPSS testing results

Result analysis

Conclusion……17

General conclusion

Limitation & Contribution

Future steps

Introduction

Although capital structure determinant is a common topic in finance and large amount of studies have already talk about this topic, the research on the determinants of capital structure in China is still limited and this problem remains to be an unsolved puzzle. Even though abundant researches have been done on the capital structure in western countries, because of the nature contradiction between the basic theory about capital structure pecking order theory and Trade-off theory, there isn't a wildly accepted opinion about the capital structure determinants. It takes researchers several decades to study in this area. Recently with the high speed development of Chinese economy, increasing number of researchers start to focus on the capital structure determinants in China.

Capital structure is seemed to have a strong influence on the performance of the company. Back to Mid-20th century, Modigliani and Miller(1958) had already argued there existed an optimal capital structure for an company to maximize their performance. Horvathova(2018) still believes there is capital structure is important to the companies' performance and try to find out the best capital structure for today's company. Therefore, the significance of capital structure toward a further development for companies are wildly accepted. This also makes the research about capital structure determinants much more meaningful.

To talk about the influence about capital structure determinants, first it is important to determine the possible determinants which will be researched. Based on the previous existing researches,

several determinants which are most frequently mentioned are chose to be analyzed in this paper. These determinants include company size, companies' growth opportunity, liquidity, profitability and risk level of the companies. It is commonly accepted by the researchers that theses determinants has influence on capital structure. To find out the influence of these determinants on companies' capital structure choice, the data of listed companies in Shanghai Stock Exchange was selected and analyzed. Shanghai Stock Exchange is one of the largest Stock Exchange market in China and almost all large and typical have issued IPO there. Therefore, it is reliable to do the research on the companies listed on Shanghai Stock Exchange. To describe companies' capital structure, the financial leverage ratio(D/E) ratio was used in this paper. Other solvency ratio was also analyzed to help find out the relationship between determinants and capital structure.

Since the capital structure is closely related to the performance of the company, the research on capital structure of Chinese listed on Shanghai stock exchange may provide direction for Chinese companies on their further development. When compared the result of Chinese companies and companies in western developed countries, Chinese companies can see the similarity and differences and adjust their capital structure which is more suitable for their long-term development. They can know how to handle these determinants to adjust their financial leverage and maximize their company performance.

Based on the reality, Chinese Stock Exchange market still in the early stage of development, which means it is now far from perfect. Generally the capital structure of listed companies in China is not reasonable enough, which will limit the growth of companies. Therefore, the research on the

capital structure determinants of listed companies in Shanghai stock exchange can be beneficial for companies' decision making and help them to establish the modern enterprise system. Since the trade between China and America is now a hot topic in the world, this study can give direction for Chinese company and let them perform better during trade war.

Literature Review

1. Trade-off Theory and Pecking Order Theory

When mentioned the capital structure problem in corporate finance, two theories are widely accepted and used, one is trade-off theory and the other is pecking order theory. These two theories are the base of almost all the researches about capital structure. The trade-off theory was first published by Modigliani and Miller(1958). According to their opinion, there exists an optimal capital structure for firm which is determined by the cost of debt and the cost of equity. This optimal capital can balance all the cost of the corporate including the cost caused by bankruptcy and agency problem. The benefit of debt is it can provide firm with tax shield while the disadvantage of issuing debt is the bankruptcy and agency cost it caused.

Another theory widely mentioned is pecking order theory, which was first put forward by Donaldson(1961) . Later it was developed by Myer and Majluf(1984). This theory predicts an apparent order when choosing their capital structure. It mentions some preference of firms during financial activities. First, firm prefer internal financing rather than external financing. When the internal financing cannot support the development of firm, the company will first borrow, which means they prefer issuing debt than equity.

Since the trade-off theory and pecking order theory are somehow contrary to each other, there are large amounts of researches focusing on these two theories. The relationship between the firm's capital structure and its' potential determinants is therefore controversial. There are some determinants widely accepted by the researchers. Bylo(2019) mentioned some potential capital structure determinants such as growth opportunities and liquidity ratio in his research. Baum(2013)

focuses on the relationship of risk of the firm and its capital structure. Balio(2016) argues capital size and profitability are also closely related to the capital structure choice of firms.

2. Company Size

Company size is mentioned as the determinant of capital structure in many research papers. According to Balio(2016), there exists an positive relationship between the size of the company and its financial leverage. After data analysis, it is concluded that the larger the company is, the higher the debt ratio will be. The reason is larger companies have lower possibility to go bankrupt. Cwynar(2015) supports this idea since larger companies are less influenced by negative factors which may lead to financial distress. In the existing researches, company size influence companies' financial leverage in a positive way

3. Growth Opportunity

The relationship of growth opportunity and financial leverage is more controversial. Myers(1977) argues higher growth potential will result in lower debt ratio because firms with more growth opportunities seem to be more risky. However, Michaelas(1999) holds different opinion toward this relationship, he argues firms which keep growing usually make full use of the internal financing. As a result, according to the pecking order theory, it will seek external financial for growing, which leads to high financial leverage. The opposite opinion is result from the controversy of pecking order theory and trade-off theory. The relationship between grow opportunity and financial leverage is not determined yet.

4. Risk

The research on the risk of the company and its influence on capital structure decision of company is even more complex. Cwynar(2015) argues firm with more volatile profit is seemed to have higher possibility to financial distress. Therefore, they are supposed to have lower financial leverage. Balio(2016) also stands for this opinion. It mentioned risker firms are more difficult to raise external capital, which lead to the lower financial leverage. Bawm(2013) does a further research in this topic, he find out that firms with high macroeconomic risk and low company specific risk are more frequently change their capital structure when their financial leverage is above average. And firms with both low macroeconomic and specific risk changes their financial leverage more rapidly when it is below target. It is wildly accepted there exists a negative relationship between firm's volatility and its financial leverage. The risk level can also influence the frequency of changing capital structure.

5. Profitability

Profitability is supposed to have a negative relationship with financial leverage level (Balio, 2016). After analyzing the data of Greek SMEs, the financial leverage of more profitable company is found lower than the companies with lower profitability. Balio(2016) explains with the pecking order theory, he suggests companies with higher profitability are more likely to use internal investments rather than external investments.

6. Liquidity

Liquidity is accepted as one of the determinants of capital structure. Sharma(2015) suggests firm who has more liquid stock may have lower cost of equity. According to the trade-off theory, the firm will choose issuing equity rather than debt, which lead to lower financial leverage. Bylo(2019) also argues the negative impact liquidity has on companies' debt ratio when he researches the capital structure of the company in transition economy. However, although many researchers hold such opinion, up to now the data evidence is still not strong enough. To prove this relationship more data analysis is required.

7. Uncertain influence of Determinants

The relationship between these determinants and capital structure is not supposed to be fixed in different economic environment and different developing period. The influence of determinants varies from different geographic condition (Uyar, 2015). Bylo(2019) suggests the influence of capital structure determinants is different in the transition economy since the existing study are almost all based on the western developed countries. Balio(2016) also argues the impact of determinants on capital structure can change during the economic crisis. These researches all mentioned different countries and different economic condition will lead to various impact of determinants. As for China, especially the listed companies in Shanghai stock exchange, the determinants of capital structure are also likely to be different from the existing result analyzed from data of western developed countries.

8. Chinses Capital Structure Determinants

Compared to other countries, the research on Chinese capital structure determinants are limited. Some researches show opposite influence of determinants. For Chinese SMEs, the influence of liquidity toward capital structure is positive (Wei, 2016). The increasing of tradable shares increases the companies' debt ratio. However, the positive relationship between tradable shares and financial leverage is not strong enough to determine the positive relationship between liquidity and companies' financial leverage. More data analysis is required to draw the conclusion.

Methodology

1.Hypothesis

This paper did the correlational study between the listed capital structure and financial leverage ratio(D/E ratio). Financial leverage ratio is the main ratio and index to describe companies' capital structure condition. Other long-term solvency ratios such as Equity Multiplier and Long-term debt were analyzed to find out the relationship between determinants and capital structure decision of companies listed on Shanghai Stock Exchange.

The hypothesis formulated to provide the direction of the study:

H1: Company size has no relationship with financial leverage in Shanghai stock exchange.

H2: Growth opportunity has no relationship with financial leverage in Shanghai stock exchange.

H3: Profitability has no relationship with financial leverage in Shanghai stock exchange.

H4: Liquidity has no relationship with financial leverage in Shanghai stock exchange.

H5: Risk has no relationship with financial leverage in Shanghai Stock Exchange.

The company size will be described as the capital size of the company. The growth opportunity will be analyzed as the companies' growth tendency with on year. Current ratio, quick ratio and cash ratio will be used as the index of liquidity level. Profit Margin, ROA (Return on Asset) and ROE(Return on Equity) will describe the profitability level. The risk level of the companies will be shown as the Beta Coefficient.

2.Model

To find out the specific relationship, this paper did the correlational study between two variables

(capital size & leverage ratio, liquidity & leverage ratio, profitability & leverage ratio, Beta Coefficient & leverage ratio). The data was collected and entered into excel and SPSS. The table and graph was made to show the relationship and Excel and SPSS was used to do the correlational test and make the report.

$$E_{ij}=R_iC_j/n$$

$$H_0: \ P_{ij}=P_iP_j$$

The model used to do the test is Chi-square model. The reason multiple regression model is not chosen is that it may lead to the multicollinearity problem. Since the determinants are not independent from each other, for example, companies may influence the profitability of the company. Chi-square model will get rid of this problem and be more appropriate for this test. The significance level the test set will be 10%. The Gramme coefficient will be used to express whether the relationship is positive or negative.

3.Data

This paper collected the data of 200 listed companies on Shanghai Stock Exchange. To make the data more representative, the companies was chosen from different industries. The data was collected from the Bloomberg and the financial reports published by the companies in open resource. The research focused on the capital size, liquidity level, profitability level, risk level and the financial leverage of the companies. The related information was found mainly form the Balance sheet and Income statement. The information of the statement of Shareholder's Equity

will also be used.

Since the Stock Exchange market in China is still in the early stage, the historical data is limited. This paper focused on the data in recent 15 years and for those companies which don't have 15 years' data, as much as possible historical data will be collected.

The A shares in Shanghai Stock exchange was chose to make the data more abundant and the result more reliable.

For the further analysis, this paper can use the data from previous report to the compare and contrast between Chinese companies and companies in western developed companies.

4. Data Analysis method

The average of 200 companies' debt ratio, capital size, growth rate, ROA, current ratio and beta coefficient was calculated. The companies with the data higher than average number was divided into the high group and the companies with the data lower than the average was divided into the low group. The crosstabs of financial leverage and other 5 variables was made to do the crosstab chi-square test.

The crosstab data was entered into SPSS and used to do the crosstab chi-square test. The significant level chosen is 10%, with the critical value of 2.706. The hypothesis with the test result larger than 2.706 was rejected.

Result

1. Data description

The data of 200 companies which listed on Shanghai stock exchange is collected for the research. The D/E ratio, total asset, revenue growth rate, ROA, current ratio and Beta coefficient are analyzed. The paper calculate the maximum, minimum, average and variance of 200 companies. Following is the basic description of these variables.

Descriptive table of major variables:

Variables	Number of companies	Maximum	Minimum	Average	Variance
D/E Ratio	200	3.6919	3.6919	0.5701	0.1058
Company Size	200	3460B	0.13B	46B	68109783Z
Growth speed	200	5.4877	-0.0866	0.2455	0.3079
Profitability	200	0.1281	-1.2044	0.0215	0.0093
Liquidity	200	6.6677	0.0000	1.5464	1.1773
Risk Level	200	6.3206	0.2900	1.0863	0.1662

2. Crosstab

The average of each variable is calculated. The data of each company is compared to the average number of 200 companies. Those has higher volume than the average is analyzed into group large company size, rapid growth, high profitability, high liquidity and high risk level. 200 companies can be divided into groups according to 2 criteria like following table shown.

Crosstab between financial leverage and determinants:

Criteria	High financial leverage	Low financial leverage	Total companies
Large company size	15	7	22
Small company size	71	107	178
Total companies	86	114	200

Table A

Criteria	High financial leverage	Low financial leverage	Total companies
Rapid growth	21	15	36
Slow growth	65	99	164
Total companies	86	114	200

Table B

Criteria	High financial leverage	Low financial leverage	Total companies
High Profitability	38	73	111
Low Profitability	48	41	89
Total companies	86	114	200

Table C

Criteria	High financial leverage	Low financial leverage	Total companies
High Liquidity	18	60	78
Low Liquidity	68	54	122
Total companies	86	114	200

Table D

Criteria	High financial leverage	Low financial leverage	Total companies
High risk level	38	48	86
Low risk level	48	66	114
Total companies	86	114	200

Table E

3. SPSS testing results

The result of SPSS Crosstab Chi-square Test:

determinants	financial leverage		
	Chi-square	Gramme coefficient	Significant level
Company size	6.395	0.527	0.011
Growth speed	4.211	0.361	0.04
Profitability	7.82	-0.384	0.005
Liquidity	20.708	-0.615	0
Risk level	0.087	0.042	0.769

Five hypothesizes of the paper:

H1: Company size has no relationship with financial leverage in Shanghai stock exchange.

H2: Growth opportunity has no relationship with financial leverage in Shanghai stock exchange.

H3: Profitability has no relationship with financial leverage in Shanghai stock exchange.

H4: Liquidity has no relationship with financial leverage in Shanghai stock exchange.

H5: Risk has no relationship with financial leverage in Shanghai Stock Exchange.

4. Results analysis

The significant level preset in proposal is 10%, and the chi-square critical value at this significant level is 2.706. Therefore, if the result of the test is larger than 2.706, we can reject the hypothesis and the variables in row and column of crosstab is not independent from each other.

According to the result table, we can see the chi-square value for Table A is 6.395>2.706, at the same time the significant level is 0.011<0.1, so the hypothesis H1 is rejected. Similarly, the results of Table B-D are 4.211, 7.82, 20.708, which are larger than 2.706. Therefore, we reject Hypothesizes H2, H3, H4. So we can say there exists relationship between financial leverage and determinants including company size, growth speed, profitability and liquidity. Since the result for table E is 0.087 which is smaller than 2.706, we cannot reject H5.

And the Gramme Coefficient show whether the relationship is positive or negative. A positive Gramme number show the positive relationship between variables in coloum and row. According to the result table. We can see the Gramme Coefficient for table A and table B is positive and the Gramme Coefficient for table C and table D is negative. Therefore, we can say these company size

and growth speed have positive influence on financial leverage, while companies' profitability and liquidity have negative influence on financial leverage.

Conclusion

1. General Conclusion

This paper finds the capital structure determinants for companies which list on Shanghai stock exchange. According to the testing result of Hypothesis, there exists significant relationship between companies' capital size, growth rate, profitability Liquidity and it's financial leverage. To be more specific, company size and grow rate has positive impact on financial leverage while profitability and liquidity has negative influence on companies' financial leverage.

Company Size & Growth speed

Statistics show the positive relationship between company size, growth speed and companies' debt ratio. Companies which have larger capitalization has higher D/E ratio. This means companies has preference and ability to borrow more money. It may result from the better reputation of large companies. The lender has more confident on larger company and are more willing to lend money to these large companies. As for the growth, the reason is similar. Evidence shows companies with higher revenue growth rate has higher financial leverage ratio. Similar as company size, investors and lenders have more confidence of the companies with higher growth rate. They believe these companies are more likely to pay for the liability and interest. In this situation, larger companies and quickly growing companies will have higher financial leverage ratio,

Liquidity & Profitability

Data shows the relationship between liquidity, profitability and companies' financial leverage is negative, which means more profitable companies has lower D/E ratio. This is reasonable according to pecking order theory since companies prefer raise internally rather than externally.

Companies has higher current ratio also has lower D/E ratio. Companies has sufficient cash may not willing to borrow money according to the testing result.

Risk

There isn't any significant relationship between the risk level and companies' financial leverage ratio.

2. Limitation & Contribution

This study has some limitation because of the limited condition can be achieved.

First, when finding the relationship between growing opportunities and financial leverage, it is difficult to measure a company's growth opportunity level with numbers. This research can only find out the previous performance of the company and found out the growth rate of the companies, which cannot perfectly represent whether the company has good growth opportunities or not.

Second, this paper use Beta coefficient to describe the risk level of a company. However, the Beta coefficient also cannot perfectly represent the risk level of the whole company. The risk level of the company is not simply according to the performance of its stock.

Third, compare to the foreign Stock Exchange market, Shanghai Stock Exchange is still at the early developing stage. Most of the companies only has about ten years data at Shanghai Stock Exchange. And the data of the companies in the first several years is volatile and not suitable for the data analysis. The available data for this research is not as much as the western developed countries.

Since most of the companies are in the early development stage, the capital structure of these Chinese companies are not perfect and not reasonable enough. Therefore, the research on the capital structure determinants can help these young companies understand more about the capital structure and make more suitable decision for the development for the company. Compared to the research of western countries, the research for Chinese listed companies is much more beneficial to these Chinese companies.

Because China is now facing the stress of trade war, the performance of every single company in China is significant and closely related to the result of the trade war between China and America. Such a research on the capital clearly focus on the capital structure determinants can provide some guidance to the domestic companies and help them perform better in the trade war.

3. Future steps

For further research, first more independent variables should be considered. Other possible determinants such as different industries can be researched. What's more, for the determinants already researched, more details can be focused. And since we use the D/E ratio as the major index, it is in regardless of whether the debt is long-term or short-term. If using long-term solvency ratio and short-term debt ratio it is likely to find out the different influence of capital structure determinants has on debt with different time period.

Chinese companies are still in the early development stage. The influence of capital structure to companies' financial performance is significant to abundant previous researches. This paper find

out the capital determinants for Chinese companies which listed on Shanghai stock exchange and hope it can give some help to the Chinese companies and let them perform better in this period of trade war and have a better further development.

References

Balios, D., Daskalakis, N., Eriotis, N., & Vasiliou, D. (2016). SMEs capital structure determinants during severe economic crisis: The case of greece. Cogent Economics & Finance, 4(1) doi:http://dx.doi.org.kean.idm.oclc.org/10.1080/23322039.2016.1145535

Baum, C. F., Caglayan, M., & Rashid, A. (2013). Capital structure adjustments: Do macroeconomic and business risks matter? St. Louis: Federal Reserve Bank of St Louis. Retrieved from https://kean.idm.oclc.org/login?url=https://search-proquest-com.kean.idm.oclc.org/docview/1697757904?accountid=11809

Bylo, A., & Çankaya, S. (2019). Capital structure determinants in transitional economies. *International Journal of Commerce and Finance, 5(1), 70-78. Retrieved from* https://kean.idm.oclc.org/login?url=https://search-proquest-com.kean.idm.oclc.org/docview/2222765709?accountid=11809

Cwynar, A., Cwynar, W., & Dankiewicz, R. (2015). Studies of firm capital structure determinants in poland: An integrative review. E-Finanse, 11(4), 1-22. Retrieved from https://kean.idm.oclc.org/login?url=https://search-proquest-com.kean.idm.oclc.org/docview/1794790705?accountid=11809

Gwatidzo, T., Ntuli, M., & Mlilo, M. (2016). Capital structure determinants in south africa: A quantile regression approach. Journal of Economic and Financial Sciences, 9(1), 275-290. doi:http://dx.doi.org.kean.idm.oclc.org/10.4102/jef.v9i1.42

Huang, W., Boateng, A., & Newman, A. (2016). Capital structure of chinese listed SMEs: An agency theory perspective. Small Business Economics, 47(2), 535-550. doi:http://dx.doi.org.kean.idm.oclc.org/10.1007/s11187-016-9729-6

Martinez, L., Guercio, M., & Guercio, M. (2019). "SMEs capital structure: trade-off or pecking order theory: a systematic review", *Journal of Small Business and Enterprise Development* (Vol. 26). doi:https://doi.org/10.1108/JSBED-12-2017-0387 .

Michaelas, N., Michaelas, N, & Poutziouris, P. (n.d.). Financial policy and capital structure choice in UK SMEs: Empirical evidence from company panel data. *Small Business Economics*, pp. 113–130.

Modigliani, F., & Miller, M.H. (1958*). "The cost of capital, corporation finance and the theory of investment"*, The American Economic Review, Vol. 48 No. 3, pp. 261-297.

Myers, S. (1977). Determinants of corporate borrowing. *Journal of Financial Economics*, pp. 147-157.

Myers, S., & Majluf, N. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Jouranl of financial economic*, 13(2), 187-221..

Sarlija, N., & Harc, M. (2016). Capital structure determinants of small and medium enterprises in croatia. Managing Global Transitions, 14(3), 251-266. Retrieved from https://kean.idm.oclc.org/login?url=https://search-proquest-com.kean.idm.oclc.org/docview/1889417287?accountid=11809

Sharma, P. &. Paul, S. (2015). Does Liquidity Determine Capital Structure? Evidence from India. *Global Business Review, 16(1)*, 84–95. doi:https://doi.org/10.1177/0972150914553510

Uyar, A., & Guzelyurt, M. K. (2015). Impact of firm characteristics on capital structure choice of turkish SMEs. Managerial Finance, 41(3), 286. doi:http://dx.doi.org.kean.idm.oclc.org/10.1108/MF-01-2014-0016

Wang, X., Wang, J., & Johnson, L. (2018). *Geography and capital structure.* Can J Adm Sci, 35: 107– 122. doi: 10.1002/cjas.1383.