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Dongxiao Liu

School of Accounting, Zhongnan University of Economics and Law, Wuhan, 430073, China, liudongxiao5@yahoo.com.cn

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Empirical Study on Influence of Optimization of Share Structure to Debt Maturity

Dongxiao Liu[*]

School of Accounting, Zhongnan University of Economics and Law, Wuhan, 430073, China

Abstract: Because of historical reasons, shares of listed companies were divided into tradable shares and non-tradable shares, which could result to serious corporate governance problem. The Split Share Structure Reform, which started from the year of 2005, is aiming to optimizing the share structure of listed company and bringing about a convergence of profit target of all the share holders. It is worth for us to examine the change of ownership structure of listed companies in mainland to see whether there is an impact on the debt maturity choice in the split share reform context. It has both theory and practice guiding significance to analyze the relationship between share structure and debt maturity because share structure is a main component of corporate governance. This paper adopts multiple linear regression models by using China mainland listed company's data to analyze the effect of debt maturity caused by share structure. It indicates that optimization of share structure can relieve the profit conflict between major shareholders and minor shareholders, which can promote company to select debt maturity appropriately and improve listed company's performance at last.

Keywords: split share structure reform, share structure, debt maturity, ownership nature

1. INTRODUCTION

Share structure is the core of listed company's governance, so optimization of share structure will lead to significant effect for listed company on selection of debt maturity. Because of historical reasons, a port of share can not circulate when company in mainland issued public offering. Thus, shares of listed companies are divided into tradable shares and non-tradable shares. There are mainly eight problems caused by Share Split, which is the basic reason leading to imperfection of corporate governance [1]. This article will focus on the perspective of a listed company debt maturity choice, and try to explore whether foreign debt maturity theory can be verified in the mainland on the unique context of the split share structure reform since the split share reform of listed companies has a significant impact on corporate governance structure. It is worth for us to examine the change of ownership structure of listed companies in mainland to see whether there is an impact on the debt maturity choice in the split share reform context. From perspective of share structure of controlling shareholder, this paper analyzes whether the convergence of the interests of shareholders has an impact on debt maturity selection of listed companies during the period, in which non-tradable shares have access to circulation gradually.

Many scholars had found that controlling shareholder had a preference to long-term debt. For the sake of different roles played by short-term debt and long-term debt, decision of debt maturity was a game result made by all stakeholders [2]. Due to the presence of large shareholders, company managers had been supervised directly and closely. From this perspective, the supervisory role of large shareholders can be an alternative to short-term loans, so creditors could provide more long-term loans to promote business development [3]. Long-term debt financing played a role on the binding ability of managers to raise new capital, emphasizing that the priority of long-term debt can prevent managers from financing for a non-profit project through future earnings dilution [4]. Controlling shareholder had a strong preference for long-term debt financing, and this preference may be more apparent when controlling shareholder' interests were inconsistent with managers' [5].

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[*] Email:liudongxiao5@yahoo.com.cn.

Researcher suggested that compared with under-investment, controlling shareholder was more concerned about liquidity risk [6]. In his statistic research, long-term debt was put in the first place when company had financial plan. From this perspective, controlling shareholder may prefer long-term debt instead of short-term debt when they were faced with fund shortage.

Compared with the long-term debt, some scholars had found that short-term debt can alleviate conflicts of interests between large shareholders and small shareholders. To a certain extent, short-term debt can solve the company's agency problems. A clear and easy method to solve (avoid) under-investment was to shorten the period of debt [7]. Researchers thought that major shareholders bored major risk of failure of investment, and also had a higher voting for participation in the business decisions, so they had more power than small shareholders [8]. As far as the implementation of management supervision was concerned, and supervision efficiency from major shareholders was greatly higher as well. Therefore they may choose short-term debt. We can find that a large proportion of shareholding and debt maturity choice may have a nonlinear relationship from above the analysis. After the circulation, the interests of orientation of ultimate controlling shareholder was relative to the value of listed companies, which confirmed that Split share structure reform had achieved the desired effect of improving corporate governance [9]. Besides, researcher indicated that the split share reform of listed mainland company improved the equity structure of listed companies in mainland China and also contributed to corporate governance efficiency [10].

This article uses dynamic data during the split share reform of listed company to observe above questions and hopes to enrich relative research results.

2.   RESEARCH DESIGN
2.1 Hypothesis

If controlling shareholders try their best to maximize their own interest by means of enhancing performance of the company with their efforts, the supervisory role of large shareholders will replace the governance and supervising role of short-term debt. Creditors are more willing to provide long-term debt, so the proportion of long-term debt of listed companies will gradually increase. Based on the above analysis, hypothesis 1is as follows:

Hypothesis 1: Impact of share ratio of the largest shareholder on debt maturity decreased first and then increased when share ratio reaches a point, showing a "U" correlation.

Controlling shareholders of state-owned companies are state-owned group company or controlling bodies at all levels. Therefore, such controlling bodies may also have proxy behavior and lead to agency cost. Person in charge of state-controlled institutions has no incentive to monitor behavior of listed companies controlled by executives. Therefore, the hypothesis 2 is given:

Hypothesis 2: The state-owned controlling shareholder has negative correlation with debt maturity structure.

As the controlling shareholder equity achieves right of access to circulation in batches 'then the controlling shareholder's interests and the interests of small shareholders tend to be consistent. Compared with the long-term debt, financing cost of short-term debt is lower. So controlling shareholder is no longer keen to seek personal gain and prefers to choose lower-cost short-term debt in order to enhance the performance of the company when faced with debt financing options. Based on above analysis, this paper considers that with shares circulation, controlling shareholder is more prone to short-term. Hypothesis3 is posed

Hypothesis 3: For controlling shareholder, ratio of outstanding shares to the total shares has negative correlation with debt maturity structure.

Proportion of outstanding shares owned by controlling shareholder to the total outstanding shares can be

used to judge function constancy of interest between controlling shareholders and small investors. In addition, ratio of outstanding shares owned by controlling shareholder to those owned by other shareholders can also be used to analyze above question. With the interests of various stakeholders towards consistency, controlling shareholder should be more inclined to choose the short-term debt in view of low financial cost. Therefore, the hypothesis 4 and hypothesis 5 are posed.

Hypothesis 4: Proportion of outstanding shares owned by controlling shareholder to the total outstanding shares has negative correlation with the debt maturity structure.

Hypothesis 5: Ratio of outstanding shares owned by controlling shareholder to those owned by other shareholders is negatively correlated to debt maturity structure.

2.2 Variable setting

Combined with extant research results, considering the share's characteristics of listed company in mainland, choice of debt maturity is defined as the dependent variable and ownership structure and other indicators as explanatory variables. Debt maturity is defined as ratio of the proportion of long-term debt to total debt measured. Existing literatures studying on the debt maturity always define long-term debt calculated in three ways, including due book value method, the weighted method of book value of long-term debt and add value method. According to financial information provided by financial statements of listed companies in mainland, this paper selects expires the book value method, which measures the amount of the total number of long-term debt as long-term debt value and selects ratio of long-term debt to total debt to measure debt maturity. In addition, explanatory and controlling variables are also defined, which can be found in Table 1 deliberately.

Table 1. Variable name and definition

Variable	Definition of variable
DM	long-term debt / total debt
RATIO	Share Proportion of Controlling Shareholder / Total Shares
RATIO2	Square of Share Proportion of Controlling Shareholder
STATE	If Controlling Shareholder is state body ' STATE is 1,or it is 0.
FOUND1	Outstanding Shares Owned by Controlling Shareholder/the Total Shares Owned by Themselves
FOUND2	Outstanding Shares Owned by Controlling Shareholder/ Total Outstanding Shares
FOUND3	Outstanding Shares Owned by Controlling Shareholder/ Outstanding Shares Owned by Other Shareholders
ZH	Total Share Ratio of the Second to the Tenth Large Shareholder / Total Shares
TAX	Tax Expense/Profit before Tax
FCF	Operating Cash Flow /（MB×Total Asset）
FIX	Fix Asset/Total Asset
ROE	Return /Net Asset
LEV	Debt/Asset
SIZE	the Natural Logarithm of Total Assets
MB	Book Value of Asset /Market Value of Asset
INDU	If company belongs to some industry T, $INDU_i$ is 1 'or it is 0.
YEAR	If sample come from year T 'YD$_t$ is 1 'or it is 0

2.3 Model design

$$DM_{it} = \beta_0 + \beta_1 \text{RATIO}_{it} + \beta_2 \text{RATIO2}_{it} + \beta_3 \text{STATE}_{it} + \beta_4 \text{FOUND}_{it} + \beta_5 ZH_{it} + \beta_6 \text{TAX}_{it}$$

$$+ \beta_7 \text{FCF}_{it} + \beta_8 FIX_{it} + \beta_9 ROE_{it} + \beta_{10} LEV_{it} + \beta_{11} SIZE_{it} + \beta_{12} \text{MB} + \sum_{13}^{23} \beta_i INDU_i + \sum_{24}^{25} \beta_i YD_i + \varepsilon_{it}$$

2.4 Sample and descriptive statistics

According to research results 'I select the 2007-2009 data of listed companies as samples in this study. Since debt maturity decision will be greatly affected in the first IPO year when companies become listed one, in order to limit impact of IPO, aiming company includes all the A-share listed company in Shanghai and shenzhen Stock Exchange, which have already finished IPO in 2005. Then, each company's financial information from

January 1, 2007 to December 31, 2009 has been collected. So an annual total sample of mixed data for the study has been established. Such data comes primarily from National Tai-database. In addition, the sample date is clarified with following principles: (1) Sample companies are only A share listed companies in Shanghai and Shenzhen Stock Exchange, So companies that issued other kind of share overseas will be deleted ; (2) Because the financial company's debt maturity is greatly inconsistent with debt maturity of company in other industries , financial listed companies are also deleted; (3) I also exclude ST and PT categories listed companies, because the financial position of these companies is in unusual circumstances, which means these companies get more than two years of consecutive losses. If they are not gotten rid of, conclusion in the study with such sample will be seriously affected; (4) such company should also be excluded with abnormal financial indicates (the largest shareholder equity ratio, debt maturity greater than 1 abnormal value and so on); (5) If relevant data can not be found, such companies are forced to given up. According to these principles, 2799 annual mixed sample dates for the study have been established finally. The tool for data process and statistical analysis is STATA11.0.

Table 2.   Descriptive statistics

Variable	Mean	Median	Standard Deviation	Maximum	Minimum
DM	0.142	0.065	0.179	0	0.924
RATIO	0.361	0.344	0.153	0.044	0.852
RATIO2	0.154	0.119	0.122	0.002	0.726
STATE	0.517	1	0.5	0	1
FOUND1	0.246	0	0.374	0	1
FOUND2	0.095	0	0.146	0	0.876
FOUND3	0.154	0	0.338	0	7.062

As shown in Table 2, ratio of the long-term debt to total debt of listed companies ranges from the lowest 0.92 to the highest level of 0.92, and the mean is 0.14, indicating that mainland companies mainly use short-term debt, compared to less use of long-term liabilities. State-owned companies can account for 52% of the total listed companies, indicating the number of state-owned listed companies is more than non-state-controlled listed companies, which mainly controlled by foreign fund or private companies. Mean and median of Shares owned by controlling shareholder are 0.36 and 0.34 respectively, indicating the controlling shareholder of listed companies in mainland China not only exist but also possess relatively high ratio which is greatly different from that which companies in western country have.

Accounted for that fact that the mean ratio of outstanding shares owned by controlling shareholder is 0.25, while the minimum ratio is 0 and the maximum ratio is 1, it indicates that only part of the sample companies achieve full circulation within period during 2007-2009. Mean ratio of outstanding shares owned by controlling shareholder to the outstanding shares reaches 0.25, while the minimum ratio is 0.1 and the maximum is 0.88, reflecting after a long-lock period, the largest shareholder's shares can be in circulation step by step, but basically proportion of the circulation part is limited. Ratio of tradable shares possessed by controlling shareholder to tradable shares owned by other shareholders means 0.15, indicating that after a period of short time shares owned by controlling shareholder has not fully realized to circulate.

2.5 Correlation analysis

Through correlation analysis of variables, I find that although correlation of ratio associated with ratio2 is more than 0.8, considering the latter is the square number of the former and both variables are important explanatory variables into model, and it is acceptable to put the two variables simultaneously into the model. In addition, correlation between FOUND1, FOUND2, and FOUND3 is greatly high, so it is sagacious to put these variables into model one by one. Correlation between Other variables is low and accepted, which proves that correlation impacts less on the regression results.

3. RESEARCH RESLUT

3.1 Statistical results

Ordinary line regression model has assumptions of zero mean and equal variance. With variance analysis, I found that problems of heteroskedasticity may exist. In order to get rid of the impact from heteroskedasticity, I decide to use White OLS, after adjustment for multiple linear regression analysis, to research. As found1, found2, found3 three explanatory variables are highly relevant, aiming to relieving effect of multicollinearity, these three explanatory variables will be put into the regression model respectively one by one.

Table 3.   Relationship between debt maturity and share structure

	(1)	(2)	(3)
VARIABLES	DM	DM	DM
RATIO	-0.317***	-0.263***	-0.293***
	(0.001)	(0.010)	(0.004)
RATIO2	0.412***	0.375***	0.409***
	(0.002)	(0.005)	(0.002)
FOUND1	-0.021**		
	(0.042)		
FOUND2		-0.089***	
		(0.002)	
FOUND3			-0.027**
			(0.045)
STATE	-0.011	-0.014**	-0.011*
	(0.100)	(0.039)	(0.098)
ZH	0.055*	0.057*	0.059**
	(0.064)	(0.054)	(0.046)
LEV	0.129***	0.130***	0.129***
	(0.000)	(0.000)	(0.000)
FIX	0.186***	0.187***	0.185***
	(0.000)	(0.000)	(0.000)
ROE	-0.063*	-0.070**	-0.065**
	(0.050)	(0.029)	(0.041)
SIZE	0.036***	0.037***	0.037***
	(0.000)	(0.000)	(0.000)
FCF	-0.229***	-0.228***	-0.228***
	(0.000)	(0.000)	(0.000)
TAX	-0.015	-0.015*	-0.015
	(0.108)	(0.100)	(0.106)
MB	-0.003	-0.002	-0.003
	(0.196)	(0.343)	(0.207)
Constant	-0.687***	-0.720***	-0.705***
	(0.000)	(0.000)	(0.000)
Observations	2 799	2 799	2 799
Adjusted R-squared	0.314	0.316	0.314

Note: * stand for 10% significance level
    ** stand for 5% significance level
    *** stand for 1% significance level

3.2 Analysis

As shown in Table 3, in the three regressions, the share proportion of the largest shareholder and debt maturity structure show a significant negative correlation, and this negative correlation is significance at 1% level. The ratio of the square of the largest shareholder and debt maturity structure has a positive relation, which is also significant at level 1%. This outcome shows that when the share ratio is low, the controlling shareholder tends to raise funds by short-term debt. After share proportion reaches to a higher point, if share proportion increases continually, the controlling shareholder will change and tend to use long-term debt to raise funds. Thus, the share proportion of the largest shareholder and debt maturity shows "U" shaped relationship. Based above analysis, hypothesis 1 has been well verified. The nature of the state-owned controlling shareholder has a negative impact on debt maturity, significantly at 10% level (in model 1 and model 3) and 5% in model 2 respectively. So hypothesis2 is confirmed. For controlling shareholder, ratio of outstanding shares to the total shared has negative correlation with debt maturity structure and shows significant level of 5%, hypothesis 3 can be verified. Proportion of outstanding shares owned by controlling shareholder to the total outstanding shares is negative correlated with the debt maturity structure and significant at 1% level, thus hypothesis 4 is verified. Ratio of outstanding shares owned by controlling shareholder to those owned by other shareholders is negatively related to debt maturity structure and significant at 1% level, therefore hypothesis 5 can be proved. These three explanatory variables are all highly significant, indicating that as the shares possessed by controlling shareholder go to circulation; all shareholders' interests function will gradually reach convergence. Thus, controlling shareholder tend to use short-term debt to raise funds in view of lower-cost.

3.3 Robustness checks

It is possible that using different measures of debt maturity structure may come to different conclusions. For this factor, I replace long-term debt used in model with new long-term debt that is defined as total number of the major long-term debt including long-term loans, bonds payable and long-term payables, measuring whether research outcome is robust or not. After regression by using new long-term debt, I find that the main conclusion remains stable, which confirms that my research result is acceptable. In addition, I clarify data and choose company whose financial data is complete within three years to gain a new sample. Then, I make use of a random effects model with this short-term panel data to regress. Then, I find that the new result in accordance with previous one and the main conclusion remains stable as well, indicating the relationship between independent variables and the dependent variable is acceptable. In this paper, I also consider endogenous problem and test whether endogenous problem is serious enough to affect research result. The endogenous model test found that debt maturity structure have little effect on outstanding shares ratio of controlling shareholder as well as other explanatory variables , which shows that there are no serious endogenous problems in the model.

4.   CONCLUSIONS

This paper focuses on the impact of debt maturity choice made by change of share structure of controlling shareholder in the background of the split share structure reform. Through empirical study of 2007-2009 mainland companies in Shanghai and Shenzhen Stock Exchange,   I have found that a significant "U" shaped relationship between controlling shareholder equity ratio and debt maturity structure exist. With the non-tradable stock equity coming to circulation in batch, interest function of controlling shareholder will be promoted to converge with other minority shareholders, basically reducing the company's agency costs. In addition, this paper finds that the nature of state-owned shareholders equity and debt has a negative correlation and this relationship is obviously significant. Consistent with the existing literature, this paper finds that share union of other large shareholders has effected a significant positive correlation to debt maturity, indicating that equity

balance to a certain extent can restrict controlling shareholder's self-serving behavior. Split share structure reform has a significant impact on change of share possessed by controlling shareholder who is mainly reflected in two aspects: First, for controlling shareholder formerly non-tradable share can go to circulation step by step; Secondly, share ratio will decrease.

According to results from the study , it is obviously concluded that accompanying controlling shareholder equity to circulate, interests of controlling shareholders and other shareholders will be convergence, which can solve basic and core corporate governance problem existed before. Just because of previous analysis showing that financial cost of short-term debt is lower, controlling shareholder may be inclined to select short-term debt, reflecting perfection of corporate governance structure optimization through split share structure reform. Besides, analyzed from the share ratio, shares held by controlling shareholder are still high and share concentration ratio may still be a problem. When faced with debt maturity choice, a "U" shaped relationship between ratio of shares owned by controlling shareholder and debt maturity exist, indicating that only all shares circulation is not enough. The main conclusions are as follows:

Firstly, it should further optimize the corporate governance structure, mainly including optimize ownership concentration by reducing share proportion of the controlling shareholder, promoting other minority shareholders to participate in corporate governance, encouraging institutional investors playing more active roles on corporate governance .

Secondly, it is sagacious to guide small shareholders to actively participate in voting for major company operating matters 'which finally prompt companies made reasonable debt maturity decision faced with raising funds and improve the company's operating performance at last.

Thirdly, institutional investor should play more role in corporate governance, which can greatly prevent controlling shareholder from making decision to grab small shareholders.

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