

# Research on the Relationship between Debt Arrangement Structure and Corporate Value

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**Abstract.** The debt arrangement structure is divided into public debt and non-public debt based on whether the information is publicly disclosed. It is generally believed that corporate bonds represent typical public debts and bank loans represent typical non-public debts of enterprises. This paper selects Shanghai and Shenzhen A-share companies listed on the main board from 2015 to 2017 as samples, and uses multiple linear regression analysis to explore the relationship between debt arrangement structure and company value. The results show that bank loans are an important source of corporate funds, the bond ratio is seriously insufficient; public debt is significantly negatively correlated with company value; non-public debt is significantly negatively correlated with company value.

## Introduction

With the integration of world economy and the rapid development of market economy, more and more listed companies focus on the optimal financing decision-making of enterprises. According to whether the information is disclosed publicly, the debt is divided into public and non-public debt financing. Usually, the ratio relationship between public and non-public debt is defined as debt arrangement structure. Debt arrangement structure not only affects the financing cost, repayment planning and governance effect of enterprises, but also has a significant impact on corporate value to a certain extent.

Since the birth of the most influential capital structure MM theory, domestic and foreign scholars have carried out research on the relationship between capital structure and corporate value. In terms of debt allocation, Blackwell and Kidwell found that non-public debt is less expensive than public debt issuance, so the company's issuance of public debt requires greater economies of scale [1]. Matthew Billett and others found that there was a significant positive correlation between operational liabilities and investment opportunities [2]. However, there are not many domestic scholars' research. The more representative ones are L.Q. Huang and Y.H. Qu. After comparing the difference between the operating and financial liability leverage on the company's creativity and growth, it is found that compared with financial liabilities, the operation Liabilities have a significant positive effect on company value creation and growth [3].

Compared with the imperfect market environment and institutional background in China, the research results of foreign scholars are more perfect. In view of this, based on the existing researches of scholars at home and abroad, this paper studies the relationship between debt arrangement structure and company value, in order to supplement and expand the existing literature.

## Theoretical Analysis and Research Hypothesis

Debt financing constitutes the main way of enterprise financing, so reasonable allocation of public and non-public debt plays a decisive role in enhancing the value of the company. Corporate bonds issued and traded by enterprises are the most direct financing form of public debt, which has lower financing cost and stronger binding force. When the company encounters a bankruptcy crisis, it is more conducive to the decision to increase the value of the company. At the same time, the transparency of information disclosure to the outside world reduces the risk compensation costs

required by issuing public bond investors. However, the large number and dispersion of corporate bond holdings has reduced the positive role of bondholders in corporate monitoring. The restrictions on monitoring and restraining management capabilities often lead to “free riders”. When the company fails to operate properly and leads to bankruptcy reorganization, it will also be difficult to reach consensus because of the highly dispersed bond investors. At present, China's capital market environment is not perfect enough. The phenomenon of "attaching importance to stocks but neglecting debts" and the impact of national macro-policy on issuing public debts are more serious. Based on the above analysis, this paper proposes hypothesis 1: public debt is significantly negatively correlated with company value.

The more typical non-public debt bank loans have greater supervision and control capabilities than publicly issued and traded bonds. Banks are relatively flexible in terms of issuance and debt repayment procedures. They can regulate the shareholding ratio of shareholders to motivate management, and can effectively curb “insufficient investment” and “asset replacement” behavior. When market information is asymmetrical, banks are more likely to obtain internal information to effectively reduce the costs of information asymmetry. However, bank loans also have drawbacks for the improvement of the company's value. As banks hold the company's non-public information, it reduces the liquidity of loans and increases the possibility of financial risks. At the same time, China's commercial banks are mainly the four state-owned banks, and their independence is not strong, and they are more seriously affected by the state's macroeconomic policies. Therefore, in the context of China's special national conditions and institutions, this paper proposes hypothesis 2: Non-public debt is significantly negatively correlated with corporate value.

## Data and Variable Selection

**Sample Selection and Data Processing.** This paper chooses the data of Shanghai and Shenzhen A-share listed companies from 2015 to 2017 as the initial sample. In order to make the data more effective, the initial sample is re-selected: (1) Remove the listed companies that had been ST;(2) Remove the listed companies of Finance and insurance;(3) Remove the missing and extreme values in the samples. After screening, there are 2011 data, all of which are mainly from Guotai'an database.

**Measurement of Indicators.** Since Tobin's Q value is a good representation of company value to a large extent, this paper chooses Tobin's Q as an indicator of company value. The corporate bond ratio is used to measure public debt, and the bank loan ratio measures non-public debt.

**Variable Selection and Model Construction.** Interpreted variables: Tobin's Q; Explanatory variables: corporate bond ratio, bank loan ratio; Model Construction. This paper selects the company size, company growth ability, equity concentration and industry dummy variables as control variables. According to the research of J.Z. Yang, Z.R. Zhang [4] and others, the following model is established.

Variable name	Symbol	Definition of Variables
Company Value	Tobin's Q	Market Value of Liabilities + Net Assets + Market Value of Equity/Total Assets at the End of the Period
Corporate Bond Ratio	BFR	Bond payable/total Liabilities
Bank loan Ratio	BDR	(Short-Term borrowing + Long-term borrowing)/ Total liabilities
Company Size	SIZE	Natural logarithm of total assets
	GROW	Corporate Growth (Net profit for the current year – net profit for the previous year)/net profit for the previous year
Equity Concentration	CR	The shareholding ratio of the largest shareholder
Industry Virtual Variables	HYn	According to the classification standard of the industry of the Securities Regulatory Commission, it is divided into 11 industries (excluding finance and insurance). If it belongs to n industries, it is 1, otherwise it is 0.

According to hypothesis 1, regression model 1 is established:

Tobin's  $Q = a_0 + a_1 \text{BFR} + a_2 \text{SIZE} + a_3 \text{GROW} + a_4 \text{CR} + \text{HY}_n + \varepsilon$

According to hypothesis 2, regression model 2 is established:

Tobin's  $Q = \beta_0 + \beta_1 \text{BDR} + \beta_2 \text{SIZE} + \beta_3 \text{GROW} + \beta_4 \text{CR} + \text{HY}_n + \varepsilon$

Among them,  $a_0$  and  $\beta_0$  represent constant terms;  $a_i, \beta_i$  ( $i=1, 2, 3, 4$ ) represent coefficients of each variable;  $\varepsilon$  is a residual term. A detailed description of each variable is given in Table 1.

## Empirical Analysis

**Descriptive analysis of sample indicators.** This paper uses SPSS software to descriptive statistics of sample variables. The results are shown in Table 2.

Table 2 Descriptive statistics of variables

variable	N	Minimum value	Maximum value	Mean value	Standard deviation
Tobin's Q	2011	0.420	5.055	1.667	0.812
BFR	2011	0.000	0.692	0.036	0.028
BDR	2011	0.000	0.956	0.337	0.227
SIZE	2011	18.951	27.035	22.387	1.019
GROW	2011	-0.991	16.323	0.432	0.685
CR	2011	8.990	62.670	35.480	13.623

As can be seen from Table 2, the Tobin's Q mean value is 1.667, indicating that the company's value level in the sample is low. The maximum value of growth is 16.323, the minimum value is -0.991, and the average value is only 0.432, which indicates that the development ability of Listed Companies in the sample is quite different and the overall growth is low. From the perspective of debt financing, the average loan-to-deposit ratio is 33.7%, and the corporate bond ratio is seriously less than 3.6%, indicating that bank loans are an important source of funds for listed companies in China, and the low proportion of corporate bonds is not conducive to public debt. From the aspect of equity financing, the average shareholding ratio of the largest shareholder is as high as 35.480%, and the standard deviation is 13.623, indicating that the listed companies have a higher concentration of equity in the sample, and the gap is large.

### Regression results of the relationship between debt allocation structure and company value.

According to model 1 and hypothesis, the relationship between public debt and corporate value is analyzed by multiple linear regression analysis. The results are as follows: Table 3:

Table 3 Regression results and significance test of model 1

variable	Company Value (Tobin's Q)			
	B	T	Sig.	VIF
Constant term	8.617	23.772	0.000	
Corporate Bond Ratio	-0.404	-2.199	0.028	1.141
Company Size	-0.308	-22.472	0.000	1.220
Corporate Growth	0.131	5.884	0.000	1.010
Equity concentration	0.002	2.031	0.042	1.132
Adjust R square		0.295		
F (sig.)		61.597(0.00)		
DW		1.916		

Table 3 gives the regression results of model 1, F value is 61.597 and R square is 0.295, which shows that the model has a high degree of fitting and independent variables can well explain dependent variables. The DW value is 1.916, the model has no first-order autocorrelation, and the VIF is less than 10 without multiple Collinearity problems. The regression coefficient of corporate bond ratio is -0.404, which passes the t-test at 5% significant level. It shows that the public debt of Listed Companies in China has a significant negative correlation with corporate value, that is, the higher the proportion of public debt, the lower the corporate value. This is related to the low level of bonds of Listed Companies in China, which shows that public debt has not played a positive role in the impact of corporate value, which is consistent with hypothesis 1.

According to model 2 and hypothesis, the relationship between non-public debt and corporate value is analyzed by multiple linear regression analysis. The results are as follows: Table 4:

Table 4 Regression results and significance test of model 2

variable	Company Value (Tobin's Q)			
	B	T	Sig.	VIF
Constant term	8.806	24.954	0.000	
Bank loan Ratio	-0.420	-6.071	0.000	1.100
Company Size	-0.306	-23.047	0.000	1.164
Corporate Growth	0.136	6.213	0.000	1.004
Equity concentration	0.002	1.671	0.095	1.137
Adjust R square		0.306		
F (sig.)		64.853(0.000)		
DW		1.905		

Table 4 gives the regression results of model 2. The F value is 64.853 and the adjusted R square is 0.306, which shows that the regression effect of the equation is better. The DW value is 1.905, the model has no first-order autocorrelation, and the VIF is less than 10 without multiple collinearity problems. The coefficient of bank loan ratio is -0.420, and it passes the t-test at 5% significant level. It shows that the private debt of Listed Companies in China has a significant negative correlation with corporate value, that is, the higher the proportion of private debt, the lower the corporate value. This is closely related to the high proportion of bank loans in China as a whole and the macro-control of the state. The "soft constraint" of bank loans weakens the beneficial impact on corporate value, which is consistent with hypothesis 2.

## Conclusion

Through empirical research on the relationship between debt layout structure and company value, this paper finds that public debt and non-public debt in the debt arrangement are significantly negatively correlated with company value. This may be due to the fact that commercial banks in China are mainly the four major state-owned banks, whose independence is not strong, which is seriously affected by the state policy, and the binding force of bank loans on managers is almost lost. Therefore, the impact of private debts based on bank loans on corporate value tends to be negative. However, the serious insufficiency of bond ratio of Listed Companies in China leads to the influence of public debt on corporate value. Therefore, China's imperfect capital market environment and special institutional background make the debt allocation structure of Listed Companies in China negatively correlated with the company value. Open and non-public debt does not play an effective role in governance. Therefore, listed companies in China should pay more attention to the financing methods of corporate bonds, adjust the proportion structure of bank loans and corporate bonds, gradually improve the bond market, and accelerate the reform of state-owned commercial Banks.

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