

# Empirical Study on the Influencing Factors of Capital Structure of Real Estate Listed Companies

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**Abstract.** This paper makes a statistical analysis of the financial data of 143 A-share listed real estate companies in China from 2015 to 2017, and makes an empirical study based on these data. It is found that the factors affecting the capital structure of listed real estate companies in China are the size of enterprises, the ability of capital guarantee, the ability of repayment of debts, the profitability of enterprises, the ability of development of enterprises and so on. First, I test the correlation between dependent variables and independent variables, and then do multiple linear regression to find out the variables with strong explanatory power and establish the optimal model.

## 1. Introduction

With the continuous development of China's economy, the real estate industry has become an indisputable pillar of the national economy, which is related to its upstream steel industry and downstream decoration industry, and contributes nearly 10% to China's GDP. The real estate industry plays an important role in our national economy. Then the real estate industry belongs to the capital-intensive industry. Most of the capital sources of the real estate industry in our country focus on bank loans. So this paper mainly studies the factors that affect the capital structure of listed real estate companies in our country. Through empirical research on capital structure of real estate listed companies, it is helpful to clarify the impact level and direction of each variable, optimize its capital structure and provide economic benefits.

## 2. Research method and hypothesis

### 2.1 Research method

This paper chooses more than 140 real estate enterprises listed in A-share market as the research object, including Poly, Merchants, Financial Street, etc. In order to avoid the impact of abnormal values, ST companies and enterprises with incomplete financial data are excluded. Finally, 139 listed real estate companies were selected as samples, and the financial data from 2015 to 2017 were screened. 329 groups of sample observation data were selected. Data comes from Guotaijunan database. In this paper, EView6.0 software is used for statistical analysis. Firstly, the correlation test of various factors affecting the capital structure of real estate enterprises is carried out. Then, the correlation between each independent variable and whether there exists multiple collinearity is analyzed. Then, the correlation between independent variable and dependent variable is analyzed, and the factors that significantly affect the capital structure of real estate enterprises are found out. Finally, the multiple regression score is used. Analyse and establish the optimal model.

### 2.2 Selection of Explanatory Variables

Referring to a large number of empirical studies on capital structure, this paper chooses six explanatory variables: enterprise size, capital guarantee ability, enterprise profitability, enterprise development ability, enterprise operation ability and enterprise solvency. The specific assumptions and explanations are as follows:

Explanatory Variables 1: There are many ways to express the capital structure, such as asset-liability ratio, equity multiplier and property right ratio, but considering that most of the sources of funds in the real estate industry in China are concentrated in bank loans, the most common asset-liability ratio is chosen as the index to measure the capital structure.  $\text{Asset-liability ratio} = \frac{\text{total liabilities}}{\text{total assets}}$ .

Explanatory Variables 2: There are many indicators reflecting the operational capacity of enterprises, such as current assets turnover, total assets turnover, accounts receivable turnover and inventory turnover. The building under construction of real estate enterprises can not be reflected from the current assets, and the turnover rate of inventory does not take into account business income. The turnover rate of total assets is more representative and can reflect the operation ability of enterprises more comprehensively. Therefore, the turnover rate of total assets is chosen as an index to measure the operation ability of enterprises.  $\text{Total asset turnover} = \frac{\text{operating income}}{\text{average total assets}}$ . The stronger the enterprise's operational capacity, the faster the capital recovery, the lower the debt will be. And make the hypothesis 1: Business operation capacity and capital structure are negatively correlated.

Explanatory Variables 3: There are many indicators reflecting the profitability of enterprises, such as net operating interest rate, return on total assets, return on net assets and so on. The core index of modern financial management is the maximization of shareholders' wealth, so the return on net assets is chosen as the index to measure the profitability of enterprises.  $\text{Return on net assets} = \frac{\text{average balance of net profit}}{\text{shareholder's equity}}$ . The average balance of shareholder's equity is used here to correspond to the average total assets in operational capacity. The more profitable an enterprise is, the more profits it represents. When it needs funds, it can consider internal financing instead of external borrowing, and its liabilities will be reduced. And make the hypothesis 2: the profitability of an enterprise is negatively correlated with its capital structure.

Explanatory Variables 4: Capital guarantee ability is expressed by fixed assets ratio,  $\text{fixed assets ratio} = \frac{\text{net fixed assets}}{\text{total assets}}$ . It needs to be explained here that the land and houses used by real estate enterprises for development are accounted for as inventory and transferred out through operating costs. The more fixed assets the real estate enterprises have, the more funds they spend on buying office buildings instead of investing in building houses. This means that the enterprises have no better investment opportunities and will repay the surplus funds to the loans, and the debt level will be reduced. And make the hypothesis 3: capital guarantee ability is negatively correlated with capital structure.

Explanatory Variables 5: The scale of an enterprise is expressed by the natural logarithm of the total assets, and the scale of the enterprise is  $\text{LN}(\text{total assets})$ . The larger the scale of the enterprise, the more operating funds it needs. If the internal funds can not meet the daily operation needs, the enterprise will use external financing, and the debt level will increase. And make the hypothesis 4: Enterprise size and capital structure are positively correlated.

Explanatory Variables 6: The solvency of an enterprise is reflected by its current ratio, which is  $\frac{\text{current assets}}{\text{current liabilities}}$ . The higher the liquidity ratio is, the more current assets are represented. When enterprises need funds to invest in projects, they can obtain funds by liquidating current assets instead of borrowing, and the level of liabilities will decrease. And make the hypothesis 5: the solvency of an enterprise is negatively correlated with its capital structure.

Explanatory Variables 7: Enterprise development ability is reflected by the growth rate of total assets. The growth rate of total assets is equal to  $\frac{\text{total assets at the end of the current period} - \text{total assets at the end of the same period last year}}{\text{total assets at the end of the same period last year}}$ . The stronger the development ability of an enterprise, the larger the amount of funds needed. If internal financing can not meet the demand for funds, the enterprise must complete through external borrowing, and the level of debt will rise. And make the hypothesis 6: Positive correlation between enterprise development capability and capital structure. The above seven variables are summarized in Table 1.

Table 1. Influential Factors Indicators and Measurement Symbols

	Influencing factors	specific indicators	variable symbols
Independent variable	enterprise operating capacity	total asset turnover rate	X1
	Corporate profitability	return on net assets	X2
	Capital Guarantee Ratio	Fixed Asset Ratio	X3
	Enterprise size	natural logarithm of total assets	X4
	Corporate solvency	liquidity ratio	X5
	Enterprise Development Capability	Gross Asset Growth Rate	X6
Dependent variable	Capital structure	Asset-liability ratio	Y

### 3. Empirical results and analysis

#### 3.1 Relevance test

Relevance test is a statistical method to determine the relationship between variables. The correlation coefficient = 1 indicates the complete positive correlation, and the correlation coefficient = - 1 indicates the complete negative correlation, and the correlation coefficient is between - 1 and 1. When the correlation coefficient is greater than zero, the variables are positively correlated; when the correlation coefficient is less than zero, the variables are negatively correlated; when the correlation coefficient is equal to zero, the variables do not affect each other. The correlation tests of seven variables are summarized in Table 2.

Table 2. Analysis of correlation among variable

	Y	X <sub>1</sub>	X <sub>2</sub>	X <sub>3</sub>	X <sub>4</sub>	X <sub>5</sub>	X <sub>6</sub>
Y	1						
X <sub>1</sub>	-0.09	1					
t	-1.74	N/A					
P	0.0827	N/A					
X <sub>2</sub>	0.23	0.33	1				
t	4.28	6.32	N/A				
P	0.0000	0.0000	N/A				
X <sub>3</sub>	-0.24	0.13	-0.13	1			
t	-4.55	2.45	-2.5	N/A			
P	0.0000	0.0148	0.0125	N/A			
X <sub>4</sub>	0.55	-0.24	0.22	-0.29	1		
t	11.91	-4.48	4.09	-5.54	N/A		
P	0.0000	0.0000	0.0001	0.0000	N/A		
X <sub>5</sub>	-0.44	-0.004	-0.05	-0.17	-0.17	1	
t	-8.98	-0.08	-0.96	-3.18	-3.304	N/A	
P	0.0000	0.9326	0.3374	0.0016	0.0011	N/A	
X <sub>6</sub>	0.39	-0.02	0.23	-0.08	0.36	-0.006	1
t	7.70	-0.40	4.29	-1.60	7.057	-0.12	N/A
P	0.0000	0.6854	0.0000	0.1101	0.0000	0.9076	N/A

Through the correlation analysis of Table 2, it can be seen that there is no significant correlation between enterprise operating capacity and capital structure. There is a significant positive correlation between enterprise profitability, enterprise size and enterprise development capacity and capital structure. There is a significant negative correlation between capital guarantee rate and enterprise debt paying capacity and capital structure. This is inconsistent with the previous assumptions, the reason may be that the real estate industry has a longer payback period, generally more than one year, even if its operational capacity is improved, the short-term capital demand is not much help. In addition, the correlation analysis is inconsistent with hypothesis 2. The reason

may be that the real estate industry is closely related to the national macro-policy. The recent purchase restriction policy has led to the decline of its profit, which is caused by the conflict with the previous high profit data.

From Table 2, we can see that there is no obvious correlation between the variables. Therefore, without considering the multiple collinearity among the independent variables, the regression equation is established:  $Y=C+\beta_1X_1+\beta_2X_2+\beta_3X_3+\beta_4X_4+\beta_5X_5+\beta_6X_6$ .

### 3.2 Multivariate Linear Regression Test

The results of multivariate linear regression analysis are summarized with Table 3,  $R^2=0.52$  adjusted  $R^2=0.51$ , and the goodness of fit of the model is good.

Table 3. Multivariate regression analysis results

Variable	regression coefficient	standard erro	t	P
C	-0.011	0.128	-0.088	0.9297
$X_1$	-0.014	0.058	-0.232	0.8162
$X_2$	0.112	0.084	1.335	0.1828
$X_3$	-0.473	0.103	-4.587	0.0000
$X_4$	0.035	0.005	6.665	0.0000
$X_5$	-0.088	0.008	-10.239	0.0000
$X_6$	0.207	0.036	5.765	0.0000

From Table 3, we can see that  $X_3$ ,  $X_4$ ,  $X_5$  and  $X_6$  have passed the P value test and can establish regression equation.

The regression equation is:  $Y=-0.011-0.473X_3+0.035X_4-0.088X_5+0.207X_6$

## 4. Research results

It is not difficult to see from the regression model that the operating capacity and profitability of enterprises have no significant impact on the capital structure. The reason may be that the macroeconomic level is not taken into account, such as changes in inflation, interest rates, government purchase restriction policies and GDP changes can significantly affect the profit level of the real estate industry. Enterprise size and enterprise development ability are positively correlated with capital structure, while capital guarantee rate and enterprise solvency are negatively correlated with capital structure. Real estate enterprises can actively adjust their capital structure to achieve optimum, starting from four aspects: enterprise scale, enterprise development ability, capital guarantee rate and enterprise solvency. This paper only analyses the factors affecting the capital structure of real estate enterprises from the micro-level, without considering the variables at the macro-economic level. Therefore, further research is needed to improve it.

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