# Empirical analysis on influencing factors of capital structure of China's real estate listed company: evidence from Chinese listed company

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**Abstract**

Capital, the guarantee for normal operation of an enterprise, is crucial to production. Therefore, optimizing the capital structure has been an important task in the development of enterprises. Combining with VAR model, this paper selects 7 factors, which are profitability, operation ability, the current debt servicing ability, development ability, tax, strategic position and the assets structure, so as to make an exploratory study on the capital structure of Chinese real estate industry, based on the data from June 2002 to December 2012. The study shows that the Liquid ratio and the gross profit are of great effects on the capital structure of a listed company.

*Keywords:* capital structure, listed company, the real estate, impulse responses

## 1 Introduction

Capital structure refers to the composition and relationship of capital. Research on the capital structure of the real estate industry mainly concentrates in the issue of financing and capital structure. Gau and Wang (1990) found that the liability of real estate Company, which has a positive effect on investment cost, has a negative effect on the expected cost of non-debt tax shield, market interest rates and financial crisis. Chen and Xia (2006) studied on the financing behaviour and financing options of the real estate company. They found that asset-liability ratio, which has a positive effect on firm size, has a negative effect on operation ability and ownership concentration. In addition, asset-liability ratio does not have a significant relationship with the profitability, solvency, and non-debt tax shields.

## 2 Data processing

Existing studies on influencing factors of capital structure contain the industry ones. However, there is not a confirmative relationship between capital structure and industry. Many scholars have found that capital structure has significant industry difference (Scott, 1972; Scott and Martin, 1975; Bradley, Jarrel and Kim, 1984; Liu, 2003; He, 2005; Tan, 2005). However, some studies have quite contrary conclusions (Hong and Shen, 2000). This study makes an analysis on the influencing factors in Chinese listed Company of real estate industry only.

### 2.1 THE SELECTED VARIABLES

We design dependent variable and independent variable as follow:

1) The dependent variable.

We adopt asset-liability ratio (total liability/ total assets), equity ratio (total liability/ Owners' Equity) and $\frac{\text{current liabilities}}{\text{total assets}}$ to measure company's capital structure.

2) The independent variable.

This paper has selected 7 factors, which is profitability, operation ability, the current debt servicing ability, development ability, tax, strategic position and the assets structure (Feng, Wu and Liu, 2000; Xiao and Wu, 2002; Zhou and Xu, 2012), shown as Table 2.1.

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TABLE 2.1 Indicators and illustration

| Influencing factor | Index | Simbol | Illustration |
|---|---|---|---|
| Profitability | Gross profit | XSMLL | Profit from operation/ Operating income |
| Operation ability | Turnover rate of return on common stockholders' equity | GDSYZZL | Revenue / Net assets |
| The current debt servicing ability | Liquid ratio | LDB | Current Assets / Current liability |
| Development ability | The growth rate of net profit | JLRZZL | (Current net profit –The net profit for last period)/ The net profit for last period |
| Tax | The actual tax rate | SJSL | The actual expense of tax /Total profit before tax |
| Strategic position | Enterprise size | QYGM | ln(Revenue) |
| The assets structure | The percentage from fixed assets to the total assets | GDZCB | Fixed assets at the end of the period /Total assets at the end of the period |

## 2.2. DATA SCREENING OF THE SAMPLE

According to <the classification guide of listed Company>, which is issued by the National Commission in April 2001, this paper selects the whole data of Shanghai and Shenzhen listed Company of the real estate industry, dating from June 2002 to December 2012. This paper excludes ST companies and incomplete ones, getting 42 companies. After standardization, we make descriptive statistics of variables shown as Table 2.2:

TABLE 2.2 Descriptive statistics

| Variable | Mean | Standard error | Median | Minimum | Maximum |
|---|---|---|---|---|---|
| XSMLL | 0.038252588 | 0.228387053 | 0.145544823 | -0.514002733 | 0.214036792 |
| GDSYZZL | 0.589755935 | 0.255617372 | 0.56523868 | 0.278723053 | 1.042955974 |
| LDB | 2.152296439 | 0.255165836 | 2.152734428 | 1.785741754 | 2.7967487 |
| JLRZZL | 1.06783448 | 3.231546326 | -0.255036358 | -1.036384764 | 13.22693968 |
| QYGM | 20.22273148 | 0.729246252 | 20.22796994 | 18.86080145 | 21.43912173 |
| GDZCB | 0.078978064 | 0.051225492 | 0.078812145 | 0.021866854 | 0.177129085 |
| SJSL | 0.263949435 | 0.041329917 | 0.26732886 | 0.180939192 | 0.341066238 |

(Date from: annual report of SSE and SZSE listed companies)

## 3 Processing and analysis of data

Making a second order autoregressive analysis from every influencing factors to asset-liability ratio, equity ratio and, we can obtain a VAR estimation result, shown as Table 3.1.

TABLE 3.1The fitting coefficients of VAR regression

| | Modified coefficient of determination of the asset-liability ratio | Modified coefficient of determination of the equity ratio | Modified coefficient of determination of $\frac{\text{current liabilities}}{\text{total assets}}$ |
|---|---|---|---|
| XSMLL | 0.832302 | 0.512510 | 0.390131 |
| GDSYZZL | 0.923190 | 0.910093 | 0.904657 |
| LDB | 0.187130 | 0.313559 | 0.235956 |
| JLRZZL | 0.834355 | 0.125683 | -0.087677 |
| QYGM | 0.846181 | 0.923855 | 0.935781 |
| GDZCB | 0.845998 | 0.859906 | 0.874597 |

It can be seen from Table 3.1 that, the fitting to capital structure from liquid ratio and the growth rate of net profit is low, while other influencing factors have a significant fitting result.

## 3.1 ANALYSIS OF IMPULSE RESPONSES

Based on VAR estimation, we can make a static simulate shown as Figure 3.1:

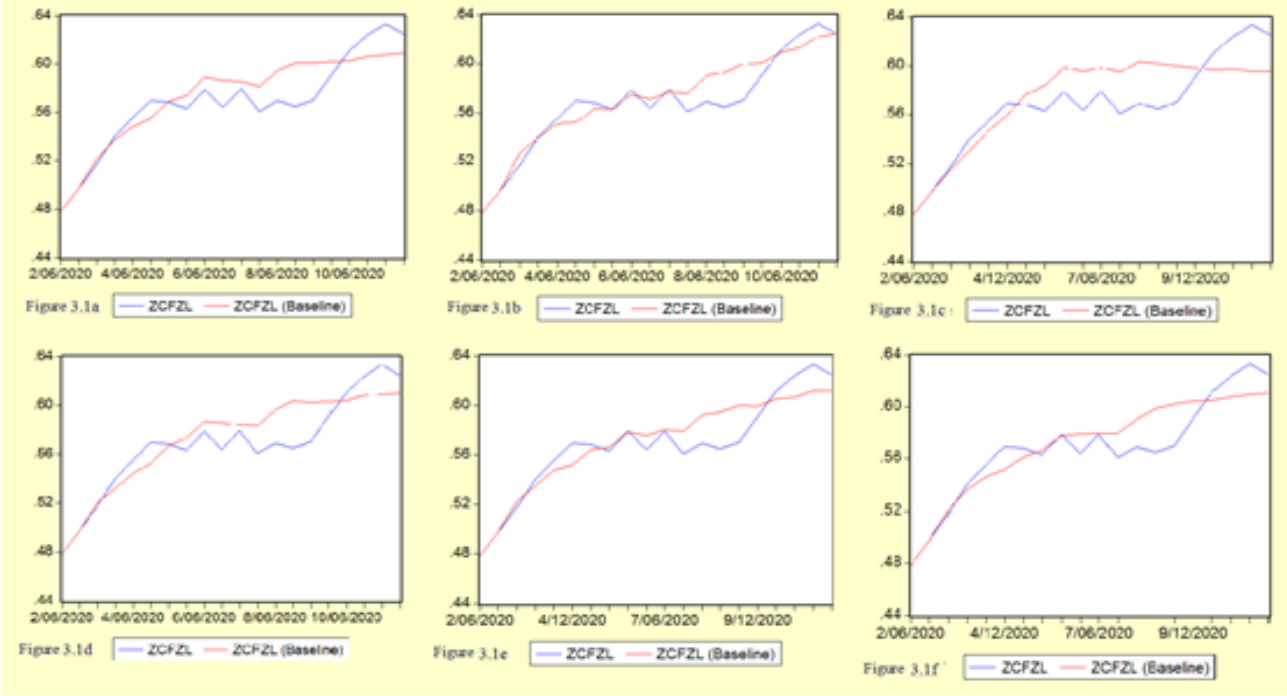


FIGURE 3.1 Static simulation from every influencing factor to asset-liability ratio

It can be seen from Figure 3.1 that, the simulation result is fine. Based on VAR model, we make an analysis of impulse response function of every factor. After giving a unit of residual shock to each factor, we could get an impulse response result shown as Figure 3.2. The horizontal axis represents the period of impulse response, while the vertical axis represents a unit of response to a residual shock. The solid line, which represents the function of impulse response, is on behalf of the response for every factor to a shock of asset-liability ratio residual.

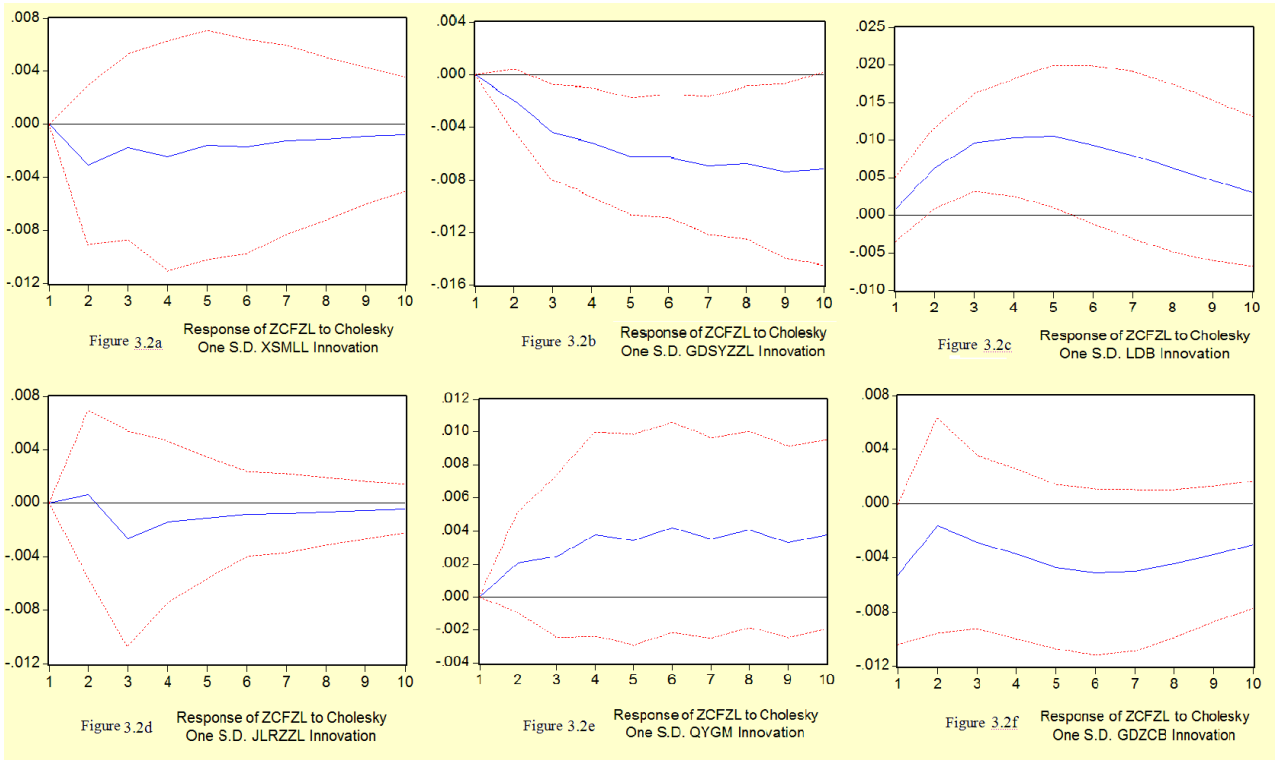


FIGURE 3.2 Impulse responses analysis from the influencing factors to asset-liability ratio

When it gives a residential shock to gross profit or the growth rate of net profit, asset-liability ratio will soon achieve convergence. Meanwhile, the shock from turn-over rate of return on common stockholders' equity, liquid ratio, enterprise size, and the percentage from fixed assets to the total assets to asset-liability ratio will not achieve convergence in the short period. We could see that in Figure 3.2.

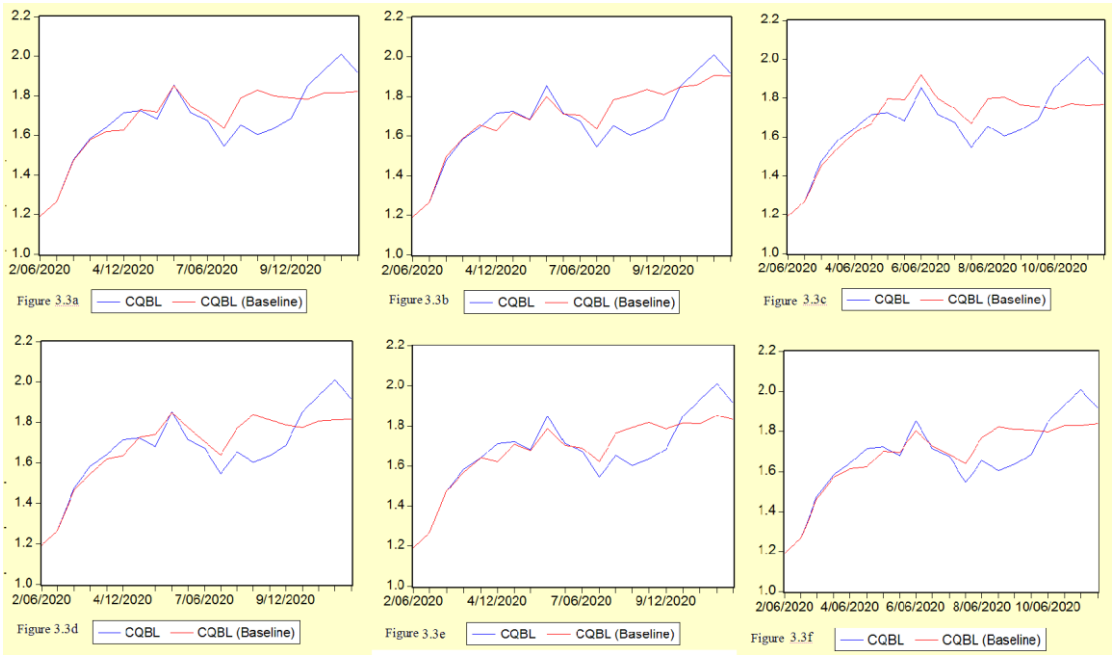


FIGURE 3.3 Static simulation from every factor to the equity ratio

In VAR simulation, every factor fits well to the equity ratio.

When it gives a residential shock to gross profit, the growth rate of net profit, or the percentage from fixed assets to total assets, the equity ratio will soon achieve convergence in current period. Meanwhile, other factors cannot achieve convergence in short period. We could see that phenomenon in Figure 3.4 as follow:

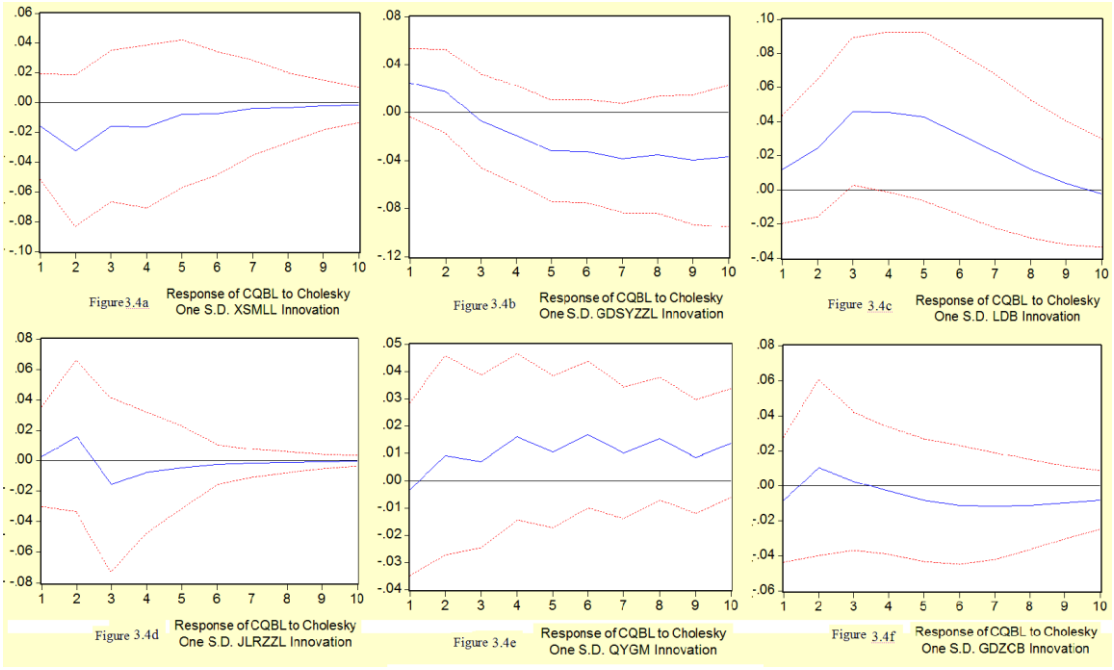


FIGURE 3.4 Impulse responses analysis from the influencing factors to equity ratio

After the VAR analysis from each influencing factor to $\frac{\text{current liabilities}}{\text{total assets}}$, we can make a static simulation. We find that every factor fits good, shown as Figure 3.5:

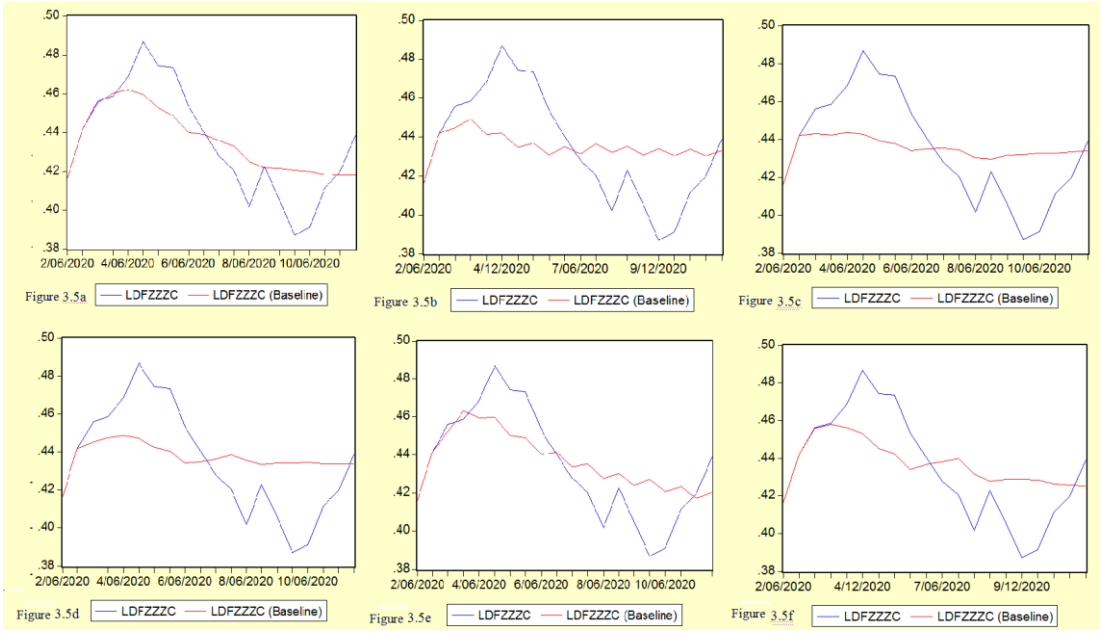


FIGURE 3.5 Static simulation from every factor to $\frac{\text{current liabilities}}{\text{total assets}}$

We make an analysis of impulse responses for every influencing factor to $\frac{\text{current liabilities}}{\text{total assets}}$, shown as Figure 3.6:

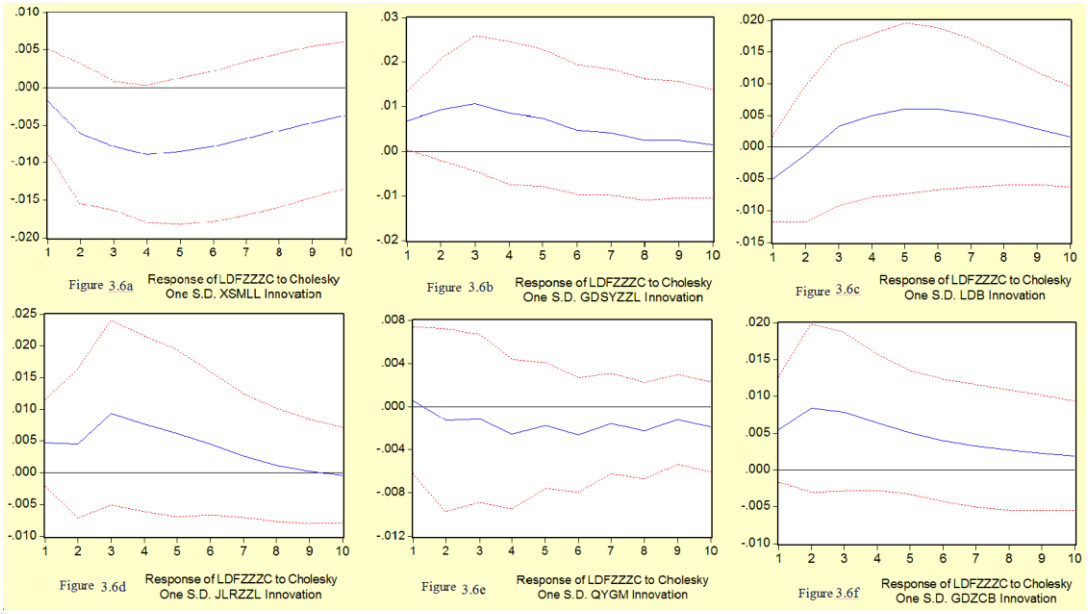


FIGURE 3.6 Impulse responses analysis from the influencing factors to $\frac{\text{current liabilities}}{\text{total assets}}$

When it gives a shock to influencing factors, $\frac{\text{current liabilities}}{\text{total assets}}$ will not achieve convergence in a short period, shown as Figure 3.6.

Therefore, we can see from the analysis of impulse responses that turnover rate of return on common stockholders 'equity, enterprise size, and the percentage

from fixed assets to the total assets could impact capital structure largely, while gross profit can just impact capital structure in a short time.

### 3.2 VARIANCE DECOMPOSITION

We decompose variance, shown as in Table 3.2 as follow:

TABLE 3.2 the results of variance decomposition

| Responsing variable | periods | Impulsing variable | | | | | |
|---|---|---|---|---|---|---|---|
| | | *XSMLL* | *GDSYZZL* | *LDB* | *JLRZZL* | *QYGM* | *GDZCB* |
| ZCFZL | 1 | 0.000000 | 22.224570 | 0.840752 | 0.000000 | 0.000000 | 20.498520 |
| | 2 | 3.125139 | 16.144570 | 27.979700 | 0.144896 | 1.558124 | 13.097470 |
| | 3 | 2.782470 | 16.123960 | 53.527540 | 1.682919 | 2.931824 | 12.807550 |
| | 4 | 3.319327 | 21.732530 | 67.078600 | 1.822697 | 6.227982 | 15.699750 |
| | 5 | 3.310592 | 30.848870 | 74.765300 | 1.876871 | 8.709116 | 20.793870 |
| | 6 | 3.463694 | 38.473050 | 78.712390 | 1.878024 | 12.275810 | 26.095500 |
| | 7 | 3.484419 | 45.705750 | 80.842440 | 1.896125 | 14.641180 | 30.342760 |
| | 8 | 3.537469 | 51.068540 | 81.831640 | 1.906555 | 17.603180 | 33.291010 |
| | 9 | 3.552802 | 55.936660 | 82.246960 | 1.913696 | 19.463710 | 35.222580 |
| | 10 | 3.573449 | 59.644260 | 82.335160 | 1.917958 | 21.745740 | 36.455110 |
| CQBL | 1 | 4.456686 | 15.497560 | 3.066314 | 0.145480 | 0.242774 | 1.157865 |
| | 2 | 11.494300 | 12.168540 | 9.636969 | 2.594981 | 0.958399 | 1.679596 |
| | 3 | 10.758400 | 10.370880 | 26.308690 | 3.493269 | 1.142577 | 1.410912 |
| | 4 | 11.336660 | 12.769120 | 37.437450 | 3.551348 | 2.977420 | 1.407895 |
| | 5 | 11.155590 | 20.135610 | 45.103720 | 3.547287 | 3.750793 | 1.938934 |
| | 6 | 11.226450 | 26.498850 | 48.599240 | 3.531348 | 5.696850 | 2.857597 |
| | 7 | 11.176420 | 33.646910 | 49.789530 | 3.527947 | 6.349977 | 3.873392 |
| | 8 | 11.183860 | 38.602930 | 49.730650 | 3.525803 | 7.858826 | 4.756385 |
| | 9 | 11.169760 | 43.658490 | 49.368730 | 3.525076 | 8.306747 | 5.433732 |
| | 10 | 11.169720 | 47.256250 | 49.123970 | 3.524727 | 9.477962 | 5.919936 |
| LDFZZZC | 1 | 1.545402 | 21.821640 | 11.499150 | 9.952159 | 0.153286 | 12.176240 |
| | 2 | 9.835713 | 23.222100 | 5.836232 | 7.915500 | 0.401072 | 17.987530 |
| | 3 | 18.512280 | 27.750330 | 5.399360 | 15.037020 | 0.471048 | 21.219260 |
| | 4 | 27.737700 | 29.904490 | 6.869310 | 17.227640 | 1.230231 | 23.164540 |
| | 5 | 34.827280 | 32.093780 | 9.423416 | 18.586280 | 1.562264 | 24.327240 |
| | 6 | 39.932240 | 32.935580 | 11.883680 | 19.447150 | 2.361749 | 25.028250 |
| | 7 | 43.167160 | 33.687120 | 13.853390 | 19.764220 | 2.641021 | 25.463650 |
| | 8 | 45.143310 | 33.900400 | 15.107020 | 19.849610 | 3.224893 | 25.744370 |
| | 9 | 46.263580 | 34.167900 | 15.677590 | 19.840780 | 3.383532 | 25.931560 |
| | 10 | 46.873460 | 34.214470 | 15.768450 | 19.820790 | 3.788013 | 26.059520 |

It can be seen from Figure 3.2 that, the liquid ratio and turnover rate of return on common stockholders' equity have a larger impact on the equity ratio and the asset-liability ratio, while is largely impacted by gross profit.

## 4 Conclusions and suggestions

### 4.1 THE CONCLUSIONS OF EMPIRICAL ANALYSIS

Through VAR analysis of influencing factors and measure variables of capital structure, we find that, gross profit and the turnover rate of return on common stockholders' equity impact capital structure most.

Therefore, in the short period, when it comes to the real estate company, we should be mainly concern about profitability and operation ability. In the long term, we should take more attention to the stability of operation ability.

### 4.2 SUGGESTIONS

The influencing factors of capital structure can reflect the preferences of the company's financing choice. According to the research, we take some advice as follow:

1) Focus on the profitability of the company

How profitable a company's operation is a crucial target. In the corporative governance, we should pay attention to how to maintain it profitable. A company, which is in a profitable operation condition, can not only provides funds to it, but also maintain its capital structure stable in a short period.

2) The company should ensure the stability of operation ability

To ensure the funds fluid is an important guarantee for the sustainable operation of a company. Enough turnover rate of return on common stockholders' equity can not only makes the funds fluid, but also maintain shareholders rights, so as to maintain the stability of capital structure. Therefore, a certain level of turnover rate of

return on common stockholders' equity is a protection for a long term operation.

Hence, whether from the point of profitability or the stability of capital structure, an enterprise shall keep the earning capacity and the operation capacity in balance.

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## References

[1] Gau G W, Wang,K 1990 Capital structure decisions in real estate investment *AREUEA Journal* 501-21
[2] Chen H H, Xia H S 2006 Demonstration analysis of China real estate industry listed company's capital structure influence factor *Special Zone Economy* 131-2
[3] Scott D F J 1972 Evidence on the importance of financial structure *Financial Management* 45-50
[4] Scott D F J, Martin J D 1975 Industry influence on financial structure *Financial Management* 67-79
[5] Liu Z B, Jiang F X 2003 Capital structure and competition in product market *Economic Research Journal* 60-8
[6] He G J, Yan Y Y 2005 Analysis on industrial differences of capital structure in Chinese listed companies *Journal of Hunan Financial and Economic College* 31-4
[7] Tan K 2005 Capital structure, ownership structure and performance: A study of Chinese listed companies *Industrial Economics Research* 23-9
[8] Hong X X, Shen Y F 2000 Our state's appeared on market companies' assets structure influence the factors of evidence analysis *Journal of Xiamen University(Arts & Social Sciences)* 114-20
[9] Feng G F, Wu L J 2000 An analysis of the influential factors affecting the formation of capital structure in Chinese listed companies *Economist* 59-66
[10] Xiao Z P, Wu S N 2002 Empirical research on the influencing factors of capital structure in Chinese listed company *Securities Market Herald* 39-44
[11] Zhou K G, Xu Y H 2012 How stable is capital structure in China listed company *The Journal of World Economy* 106-20
[12] Yang C H, Liu X M, Wei Z X, Geng Z Z 2011 Empirical research of pricing efficiency of Chinese futures market based on a VAR model *Journal of Applied Statistics and Management* 330-8

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