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The Relationship between Capital Structure and Financial Performance of China's Real Estate Listed Companies

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Abstract After experiencing a roller coaster era of price rocketing and plumping, the development of China's real estate industry will tend to be stable under the government's macroeconomic control, which needs more effective financial management methods. This paper applies factor analysis to analyze the relationship between capital structure and financial performance of real estate listed companies in Shanghai Stock Exchange from 2010 to 2012, which concludes that the capital structure of real estate listed companies is negatively related to its financial performance, and provides related suggestions on optimization of capital structure.

Keywords: *real estate listed companies, capital structure, financial performance, factor analysis*

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1. Introduction

Since China's real estate market began to start in the 1980s, it has experienced a non-rational operation, and continuing price rising after relatively stable and sustained development which thoroughly departures from the same period of our country's living standards. While in 2014, with the increase in personal loans rates, as well as the financing restriction of real estate developers, the growth of investment in real estate began to fall sharply, which leading to inventory backlog and a sharp decline in prices. In the National People's Congress of 2015, the real estate industry has become a hot topic once again. Government Work Report proposes clearly that support demand of residents' living and housing improvement, and promote the healthy development of the real estate market. Although these statements were understood as good news, according to a number of data released by National Bureau of Statistics of China, market index downward trend were unchanged. However, under the background of macroeconomic control, the development of real estate industry will tend to be stable. Distinct from the rapidly developing industry, effective financial management methods are more needed by stably developing real estate industry. Therefore, this paper empirically analyzes the relationship between capital structure and financial performance of real estate listed company, and puts forward the practical suggestions.

Quite a lot of researches on the relationship between capital structure and financial performance have existed in China and abroad. In the paper of *The Cost of Capital, Corporation Finance and the Theory of Investment* Franco Modigliani and Merton H·Mille [1] put forward the MM theory that capital structure and enterprise value were not relevant under certain conditions. In 1963, some scholars in this field improved the theory that with income tax corporate debt and corporate value were positively related. Berger examined the relationship between capital structure and firm performance and found that high debt ratio lead to high level of profitability. In addition, there are also some researches of negative conclusion. Myers and Majluf [2] investigated that high profit margins would result in lower financial leverage ratio, which illustrated the negative correlation between profitability and the book value of the financial leverage ratio. Jesen, Solberg and Zorn [3] pointed out that debt ratio and profitability was negative related in *Simultaneous Determination of Insider Ownership, Debt, and Dividend Policies.*

There are also many researches on capital structure in China, and the relationship between capital structure and financial performance of different research objects are positive or negative. Based on a large number of sample firms, Hong and Shen found that the company's debt ratio was positively related to its profitability which was similar to the conclusion of Wang and Lv's research. Chen and Li [4] analyzed the data of the listed companies in Shanghai Stock Exchange, and the results show that debt to asset ratio and profitability is negative related. Fu, Liu, and Gao [6] selected the 24 real estate listed companies of Shanghai and Shenzhen Stock Exchange as the research objects to illustrate the negative relationship between debt to asset ratio and profitability. Several reasons lead to different conclusions about the relationship between capital structure and financial performance, such as

complex factors that affect the performance of the company, sample diversity and various research methods.

2. Related Concepts and Theories

2.1. Real Estate Industry

2.1.1. Summary

Real estate industry refers to an integrated industry based on land and buildings which engages in real estate development, construction, operation, management, maintenance, decoration and service. At present, China's real estate industry has the following characteristics:

First of all, investment amount for real estate industry is relatively large, and construction period is so long that the completion of a project often takes several years, which require the property developers to have good insight, accurate investment awareness and decision-making ability.

Second, the real estate industry changes with the environment of business cycle. When the macroeconomic environment is well, real estate industry has achieved rapid development and high profit growth. While the real estate industry is most hit by a recession, cash flow problems and profit decline have followed.

Third, government regulation and control has great influence on the economic development. The real estate industry developed rapidly due to the encouragement of policy. But in recent years, the rise in housing prices exceeds the people's income growth, and people cannot even afford to buy a house. In this context, the government will develop policies to curb price increases.

2.1.2. Present Status

Since March of this year, China’s real estate market has been showing a warming trend, and the house prices of most cities have risen at varying degrees. According to the data from National Bureau of Statistics of China, sales area of national commercial housing achieved to 599,140,000 square meters from January to July, and saw year-on-year rises of 6.1 per cent, up 2.2 percentage points compared to the period from January to June. Sales of 4,117,100,000,000 yuan saw year-on-year rises of 13.4 per cent s, up 3.4 percentage points. However, more developed cities are more benefited from market rebound compared to less developed cities.

Market rebound also led to the withdrawal of funds indicating that the market provides a strong financial support for real estate developers that will boost the confidence of construction. With the sufficient funds, investment on real estate development has gradually stabilized. In July, the real estate index is 93.03, up 0.4 percentage points compared to last months, which is still at historic lows, but has rebounded for two consecutive months. All of the data show that the development of China's real estate tends to be steadily.

2.2. Capital Structure Theory

Capital structure theory explains the composition and proportion of various capitals of enterprises. Early capital structure theory includes net income theory, net operating income and the traditional theory which was proposed by the famous economist David Durant in 1952. The net income theory holds that the proportion of debt in the capital structure of the enterprise is positively related to its net income, which means debt increasing can increase the net income of the enterprise. While the net operating income theory refers that the amount of the debt and equity of an enterprise does not affect its value. The traditional theory, a compromise between these two extreme views, confirmed that increasing debt is beneficial to improve the value of the company, but the size of debt capital must be appropriate in order to preventing the company from going bankrupt. However, since these three theories have not been verified by statistical analysis, they have not been approved by the theory horizon.

Modern capital structure theory originated from the MM theory in 1958 has a history of nearly 60 years. In these 60 years, the scholars all over the world have a wide range of research results in the theory of capital structure, including agency theory, signaling transmission and trade-off theory which are widely accepted. The MM theory insists the irrelevant relationship between business value and capital structure in the case of perfect market. In 1963, the MM was amended that taking income tax into account, the more debt company raised, the more value of the enterprise was realized. The enterprise value reaches the maximum when all financing comes from liability in theory. In 1970s, signaling theory was proposed by the famous scholar Ross. The theory believes that capital structure and dividend policy can play a role in transmitting information, namely a higher ratio of debt to asset or a good dividend policy indicating a good business operation. The value and profitability of enterprise are positive related to the debt ratio. On the basis of previous scholars' theories the trade-off theory was put forward to find out how enterprise value achieves the maximum depending on the capital structure, in which in a certain range, the financial leverage can increase the value of the enterprise. As similar to trade-off theory, agency theory suggests that capital structure will affect the managers’ ability and choice of other acts, so as to affect the future cash income and market value. Therefore, debt financing can enhance the value of the enterprise to a certain extent.

2.3. Performance Evaluation Theory

Enterprise performance evaluation refers to the objective description of the enterprise’s operating results, current situation and level of development in a certain period through specific models and methods. Enterprise performance evaluation was originated in 1700s when the performance was equivalent to the concept of profit that is equal to income minus cost. Income depends on the market price, so the only way to achieve high performance is to reduce cost. In early twentieth Century, the DuPont Co combined the financial indicators of several aspects, which has a very important role in the history of the enterprise performance evaluation. That is known as DuPont Analysis, whose basic idea is to decompose ROE into a product of several financial ratios to analyze the operation performance.

The general method of enterprise performance evaluation in China is to select some indexes and calculate the weight of each index. And factor analysis is the most

objective and fair method of all, which select variance contribution rates as weights, more accurate than the subjective assignment. Furthermore, factor analysis can effectively eliminate the influence of irrelevant indicators, and reduce the redundancy of information, so as to ensure the simplicity of methods and objectivity of results. Therefore, this paper adopts factor analysis to carry out the performance evaluation.

3. Empirical Analyses

3.1. Sample Selection

This paper selects real estate industry listed companies of Shanghai Stock Exchange from 2010 to 2012 as sample, and in order to guarantee the validity of statistical results, eliminates:

(1) Real Estate Conduit Company, because of its big difference in nature and capital structure.

(2) Companies that were classified as ST during 3 years.

(3) B shares listed companies to ensure the comparability of data.

(4) Companies whose financial ratios fluctuated greatly over 3 years which means major changes in the operation from 2010 to 2012, such as China World Trade Center, whose inventory turnover were 30.09, 36.38, and 34 that were greatly exceeding the average level of real estate industry (0.02-3.57).

(5) Companies with incomplete financial data.

The final list is as follows:

Table 1. Sample List (Stock Ticker)

600622	600322	600639	600376	600684	600053
600621	600649	600158	601588	600736	600383
600791	600606	600393	600743	600239	600064
600696	600225	600716	600638	600745	600663
600647	600823	600565	600185	600773	600246
600658	600724	600223	600641	600266	600862
600067	600683	600173	600048	600325	600162
600510	600533	600748	600665	600657	600240
600732	600208	600052	600675	600503	

3.2. Descriptive Statistics

There are six indicators in this paper, respectively, debt-to-asset ratio, ROA, ROE, current ratio, earnings per share and net profit growth rate.

Table 2. Indicators Selection

solvency	Debt-to-asset ratio
	Current ratio
Profitability	ROA
	ROE
	EPS
Development Capability	Net profit growth rate

Descriptive statistics of relevant indicators of 53 real estate listed companies is as below:

From the above Table 3:

a. Debt-to-asset ratio: the mean is 0.6655, the minimum 0.28 comes from Duolun (600696) in 2010, the maximum 0.92 comes from Lushang (600223) in 2011. The companies are centered in the range from 0.50 to 0.80, which can infer that the ratios of most real estate listed companies are more than 0.5. This is also consistent with the reality that longer period for construction and more funds for investment of real estate industry are needed.

b. Current ratio: Reflect the short-term solvency of the company. When the current ratio is less than 1, the current assets are not enough to pay the current liabilities, but excessive ratio will cause the funds not be made full use of good project investment. The mean of 53 real estate listed companies is 1.8999. The minimum 0.72 is from

Table 3. Descriptive Statistics

Descriptive statistics						
	N	Range	Minimum	Maximum	Mean	Std. Deviation
Debt-to-asset ratio	159	0.64	0.28	0.92	0.6655	0.12234
ROA	159	0.13	0	0.13	0.0358	0.0228
ROE	159	0.4	0.01	0.41	0.1138	0.06597
Current ratio	159	5.3	0.72	6.02	1.8999	0.76203
Net profit growth rate	159	7.81	-0.94	6.87	0.2284	0.86701
EPS	159	1.33	0.02	1.35	0.4106	0.30138

Pudong Jinqiao(600639) in 2012. The maximum 6.02 is from Pearl River(600684) in 2012. The ratios are mostly distributed between 1 and 2.

Through the analysis of the first two indicators, we can know that the debt-to-asset ratio and current ratio of real estate listed company are relatively high. The mean of debt-to-asset ratio is 0.6655, more than 0.5, and the highest ratio has reached 0.92 showing 90% of total assets from the debt, which produces a fairly high risk of going bankrupt. The mean of current ratio is 1.8899, which is close to 2 and significantly greater than 1. The highest current ratio has reached 6.02, which manifests the relatively conservative management of real estate listed company in China.

We select 3 enterprises with high debt-to-asset ratio in Table 4. The debt-to-asset ratio of Lushang(600223) has been more than 0.90 for three years, while the mean of current ratio 1.22 is not high, which is the signal of easy bankrupt. The debt-to-asset ratios of other two companies are also relatively high. The mean of debt-to-asset ratio of Tibet Urban Development and Investment (600773) is close to 0.9, and the mean of current ratio is 2.01. The mean of debt-to-asset ratio of Metro Land (600683) is 0.8033, and the mean of current ratio is 1.57. The higher debt-to-asset ratio can be determined by the operating characteristics of real estate industry, such as big investment funds and big percent from bank loans, which result in big debt-to-asset ratio and strong dependence on debt. Meanwhile the current ratios of 3 companies are maintained more than 1 showing that they are not likely to suffer from short-term solvency problems.

Table 4. Three Companies with High Debt-to-Asset Ratio

		2010	2011	2012	Mean
600773	Debt-to-asset ratio	0.89	0.85	0.86	0.8667
	Current ratio	2.05	2.18	1.8	2.01
600683	Debt-to-asset ratio	0.75	0.82	0.84	0.8033
	Current ratio	1.57	1.49	1.65	1.57
600223	Debt-to-asset ratio	0.75	0.92	0.92	0.9133
	Current ratio	1.29	1.23	1.14	1.22

c. ROE: The mean of 0.1138 illustrates a higher level of profitability. The minimum 0.01 is from Duolun (600696), Shanghai Xinmei (600732), Zhongjiang (600053) and Donghua (600393), and the maximum 0.41 is from

Lushang (600223). The standard deviation is less than 0.07 showing a relatively small volatility. In addition, the relationship between debt-to-asset ratio and ROE can be found to be positive by a detailed comparative analysis.

d. EPS: The mean is 0.4106. The maximum 1.35 is from Beijing Urban Construction Group (600266) in 2010. The minimum 0.02 is from Duolun (600696). The number of companies of EPS more than 1 is relatively small, while EPS of large number of companies is below 1. The standard deviation 0.30138 shows that the data fluctuation is not obvious.

e. Net profit growth rate: Indicator for development capability. The mean is 0.2284. The maximum 6.87 is from Beih-Property (600791) in 2010. The minimum -0.94 is from Deluxe Family (600503) in 2012. The number of companies with negative net profit growth rate occupies a small proportion in 2010 and 2011, while it accounts for 50% of the total amount in 2012, which explains the decreasing profit level in 2012 compared to last two years.

f. ROA: Reflect the profitability of the enterprise. The mean is 0.0358. The maximum 0.13 is from Deluxe Family (600603). The minimum 0.00 is from Zhongjiang (600053) and Donghua (600393). The standard deviation 0.0228 shows insignificant fluctuation.

3.3. Regression Analysis

3.3.1. Research Hypothesis

Hypothesis: The capital structure and financial performance of real estate listed company in China are negatively related.

Although there are a lot of western theories confirming that the company's capital structure and financial performance are positive related, China's situation is different. In China, real estate industry plays a significant role in the national economy, and the fluctuation of macroeconomic cycle will affect the development and lower-reaches industry of the real estate industry, which is very important to our country's economy. Therefore, moderate intervention and adjustment for real estate industry by the government are needed. Simultaneously, the financing channel of enterprises in China is single, generally from commercial banks. All of the above are different from developed countries. In this paper, we assume that the relationship between capital structure and financial performance of real estate listed companies is negative.

3.3.2. Model Building

a. Explanatory Variable

The explanatory variable is capital structure of real estate industry, which is measured by debt-to-asset ratio.

b. Explained Variable

The explained variable is financial performance of real estate industry, which is measured by solvency, profitability and development capability indicators that are used to figure out comprehensive financial performance by factor analysis.

c. Control Variable

The control variable is company size, which is measured by the logarithm of total assets.

3.3.3. Factor Analysis

Factor analysis is a statistical technique to extract common factors from a variable group. That is to refine fewer variables from a number of variables. It has the following features.

a. The number of factors is far less than the number of the original variables.

b. Information is seldom lost.

c. The linear relationship among the factors is not significant.

d. The factors have named interpretations.

In this paper, 5 indicators of 3 aspects of performance evaluation are used for factor analysis.

The first step is to investigate whether the original variables are suitable for the factor analysis. From Table 5, the observation value of statistic of Barlett Test of Sphericity is 203.553, and the corresponding P-value is close to 0 less than the significance level α (0.05), so null hypothesis should be rejected, which means significant difference between correlation coefficient matrix and identity matrix. In addition to KMO value (0.695) more than 0.5, according to the KMO measurement standard given by Kaiser, we can know that the original variables are suitable for factor analysis.

Table 5. Barlett Test of Sphericity and KMO Test

KMO measure of sampling Adequacy	0.695
Barlett Test of Sphericity	203.553
df	5
Sig.	0.000

The second step is to extract factors from original factors that is the core of factor.

Table 6. Total Variance Explained

	Initial Eigen values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.372	47.431	47.431	2.372	47.431	47.431	2.289	45.786	45.786
2	1.027	20.542	69.973	1.027	20.542	67.973	1.109	22.188	67.973
3	0.846	16.912	84.886						
4	0.486	9.716	94.602						
5	0.27	5.398	100						

By the results of Table 6, the 5 indexes can be synthesized into 2 factors, which reflect 67.973% information of original variables indicating the ideal effect of factor extraction.

The third step: According to the results of the second step, 2 factors were calculated as a comprehensive evaluation factor by using factor scores. The weight of the first and the second factor are respectively 45.786% and 22.187% (67.973%-45.786%). The comprehensive performance evaluation factor is the product of the corresponding values and weights of each factor.

The fourth step is to analyze the relationship between performance evaluation factor and debt-to-asset ratio. The results are as follows:

Table 7. Correlations

Control variables			Debt-to-asset ratio	Performance factor
Logarithm of total assets	Debt-to-asset ratio	Correlation	1.000	-0.172
		Significance		0.031
		df	0	156
	Performance factor	Correlation	-0.172	1.000
		Significance	0.031	
		df	156	0

From Table 7, the correlation coefficient between debt-to-asset ratio and performance factor is -0.172, revealing a weak negative correlation. The P- value of the correlation test is approximately 0.031, less than 0.05. Therefore, the relationship between them is negative.

The fifth step: According to the results of ANOVA, as shown in Table 8, the observation value of F test statistic is 4.352, and the corresponding P- value is 0.014. In the case of significant level of 0.05, because the P-value is less than 0.05, the null hypothesis should be rejected. The linear relationship between the explanatory variables and the explained variable is significant, and the linear model can be established.

Table 8. ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	4.678	2	02.339	4.352	0.014
Residual	83.844	156	0.537		
Total	88.522	158			

On the basis of significance test on regression coefficients, as shown in Table 9, in the case of significant level of 0.05 P-values of regression coefficients of debt-to-asset ratio, logarithm of total assets and constant in t test are respectively 0.018, 0.031, and 0.007, all of which are less than 0.05. Hence the linear relationship between them and explained variable is significant, and they should be kept in the equation.

Table 9. Coefficients

Model	B	Std. Error	Beta	t	Sig.
constant	-3.030	1.272		-2.381	0.018
Debt-to-asset ratio	-1.156	0.530	-0.189	-2.180	0.031
Logarithm of total assets	0.165	0.060	0.238	2.742	0.007

4. Conclusions and Suggestions

The empirical analysis suggests that the relationship between capital structure and financial performance of real estate listed company is negative, which is different from western capital structure theory that considers that if the debt of the enterprise increases, the function of tax avoidance will strengthen, and the performance of the enterprise will be improved. However, due to the strong macroeconomic control to the market and single financing channel in China, the capital structure and financial performance of real estate listed companies are negative related that means increasing debt ratio will reduce the financial performance.

According to the above research results, we put forward the following suggestions for China's real estate listed companies.

First, the real estate listed companies can appropriately reduce the debt-to-asset ratio.

Second, current ratio of real estate industry is relatively large, which can be reduced to make more resources for long-term investment.

Third, financing channels should be broadened. The companies get financing just from commercial bank loans, financing channel of which is relatively single compared to developed countries. Undeveloped financing market will affect the optimization of capital structure and hinder the development of companies. Therefore, our government should actively guide and broaden the financing channels for companies.

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