**Government should regulate the real estate market and the stock market.** As for the real estate market, first, government should improve the relevant land policy and land transaction market, and establish a fair and transparent bidding system. Second, government should strengthen the monitoring of the real estate market, especially the real estate enterprises, and strictly find out the violations. At the same time, establishing the electronic database, government should timely adjust the housing supply ratio and increase the land utilization rate, in order to promote the real estate market's stable development. Third, government should carry out the housing security policies, referring from Sheng et al. (2005).

Government should guide the consumers to consume rationally in the real estate transactions. Giving the first set of housing loan interest rates and controlling the second set of housing investment, the government should avoid the serious real phenomenon, in order to reduce the overheating real estate market. In addition, government should establish a sound secondary market and increase the supply of affordable housing and low-cost housing to support the development of the leasing market and also ease the real estate market in short supply an the livelihood needs.

As for the stock market, firstly, government should expand the size of the stock market, increase the variety of financial products, broaden the investment channels, and give full use of the stock market's wealth effect. Secondly, government should increase and improve the stock market-related system. In fact, speculative capital of the stock market flows fast, which has a large number, and the entire market is in a state of impetuous. To improve the basis of the stock market, on the other hand can enhance the investors' confidence in the stock market, which can keep the stock market prosperous and stable for a long term. Thirdly, strictly grasping the quality of listed companies to raise the threshold of listed companies as well as standardizing the examination and approval systems, government should regulate the behavior of stock market to protect the legitimate interests of small and medium investors.

**Investors choose rational investment portfolio.** In recent years, with the rapid development of the real estate market and the stock market, the investors often choose the real estate and stock portfolio as the main object. On the one hand, according to portfolio theory, investors can adjust the ratio of the portfolio. On the other hand, investors should be aware of the negative correlation between the housing price and the share price, referring from Yin (2008). Considering their risk preferences and investment targets, they should adjust the investment proportion of the two assets investment proportion. Then they can control the level of risk in the acceptable range to achieve maximum benefits.

# CONCLUSION

The real estate market and the stock market has become the main investment in the capital market. Making the research about the fluctuations and the correlation of the fluctuations between the two markets, is not only conducive to investors to understand the trend of price fluctuations, but also a key part to improve the regulatory system for government and the supervision departments.

According to the empirical study on the monthly logarithmic yield of the commercial housing sales and the Shanghai Composite Index, the following important conclusions are drawn. Firstly, there is no cointegration relationship between the real estate market and the stock market, that is to say, there is no obvious linkage relationship. Secondly, in 95% of the confidence level, the sales of commercial housing is the Granger reason for the Shanghai Composite Index, but the Shanghai Composite Index is not the Granger reason of the commercial housing sales. Through the empirical study of the real estate market and stock market from 2006 to 2015, it is found that there is no obvious linkage between the two markets, which shows that China's financial capital market is not mature. Therefore, there may be irrational factors in the rising prosperity of the real estate market and the boom of the stock market in 2007 and 2015, leading to weakening the linkage between the two markets.

The shortcoming of this paper is the limitation of data selection. As the housing prices that China's National Bureau of Statistics released are the monthly data. For the united index, this paper selects the monthly datas of the real estate market and the stock market. In reality, the Shanghai Composite Index reflects the stock market trend by daily datas, so there is a little deviation between the research and the actual situation. At the same time, the monthly data leads to the problem of less data, which is prone to bring problems such as the deviation and instability between the empirical analysis and actual phenomenon. Therefore, it is necessary to take the data analysis at high datas so as to make the data analysis more accurate.

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# Research on the Systematic Risk of Real Estate Listed Companies in China: Based on Financial Perspective

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# Abstract

In this paper, we used all the A-share real estate listed companies in China as the sample. Based on the micro-company's financial data of the year 2015–2016, we selected 15 financial indicators to carry on the factor analysis, and 5 common factors, including the profitability factor, the solvency factor, and the growth ability factor, were extracted. We used multiple common linear regression models with five common factors and systemic risk indicators calculated by the capital asset pricing models, and the study found that the common factors had a significant impact on the systemic risk of the real estate listed companies in China and the impact level of the common factors on systemic risk.

# **INTRODUCTION**

According to the classification of the industry in 2012, China's A-share listed real estate enterprises are 131 by the end of 2016, the total share capital is more than 238.1 billion shares, the market circulation is more than 186.4 billion A shares and the total market value is more than 2.4 trillion. The real estate industry is an important pillar industry and a key investment and consumption field in China at this stage. The risk of the real estate industry is an important part of China's economic risk. The research on the risk of real estate market and supporting the development of the national economy (Ellobody and Young 2015).

# METHODOLOGY

**Data sources and processing.** According to the classification of the industry in 2012, China's A-share listed real estate enterprises are 131 by the end of 2016. In these real estate enterprises, we remove of non-compliance with the conditions of the sample (ST companies and time to market is shorter than the range of enterprises) and finally get 111 companies. We take the financial data of the annual financial statements of these enterprises from 2015 to 2016 as the research samples.

The financial data and Beta data used in this paper are derived from Reith Financial Database.

**Index selection and processing.** In the selection of the accounting index, I combine predecessor's research foundation and analysis of a number of financial indicators, and fully consider the indicators of universality (Feng et al. 2013). In the end, I select the 15 accounting index, respectively, on behalf of the company's profitability etc. five aspects are shown is Table 1:

Abbreviation				Name		Effect	Direction
ROE	Rate	of	Return	Common	Stockholders'	Profitability	Increasing
	Equit	у				Index	beta
RA	Retur	n on	Assets				coefficient
RI	Retur	n on	Investme	ent			
CR	Curre	nt Ra	atio			Solvency	Reduced beta
QR	Quick	Rat	io			Index	coefficient
ER	Equit	y Ra	tio				
TPG	Total	Prof	it Growth	Rate		Growth	Increasing
GNA	Grow	th Ra	ate of Net	t Assets		Ability	beta
OIG	Opera	ting	Income (	Growth Rate	e	Index	coefficient
IT	Inven	tory	Turnover			Operational	Reduced beta
CAT	Curre	nt As	ssets Turr	nover		Capability	coefficient
TAT	Total	Asse	ts Turnov	/er		Index	
DAR	Debt .	Asse	t Ratio			Capital	Reduced beta
FCR	Fixed	Cap	ital Ratio	1		Structure	coefficient
ICR	Intang	gible	Capital I	Ratio		Index	

### Table 1.Index Selection.

Before doing the factor analysis, we have to carry on the positive treatment to the financial index. In order to compare with the value of the forward index, we need to forward the reverse index. In our choice of 15 indicators, the equity ratio is a reverse indicator (Li and Zhang 2012). The actual index value of the company is  $X_{\rm T}$ , and the positive value of the positive treatment is  $X_{\rm B}$ :

$$X_B = \frac{1}{X_T} \tag{1}$$

$$X_0 = \left(\sum_{i=1}^{111} X_i\right) \div 111 \tag{2}$$

$$X_B = \frac{1}{\left|X_T - X_0\right|} \tag{3}$$

In addition, the debt asset ratio, fixed capital ratio, intangible capital ratio and equity multiplier are moderate optimal index (Sang 2012). We set the company's actual target value is  $X_T$ , the optimal value of the treated  $X_B$  and the optimal value is  $X_0$ . We set  $X_0$  as the average financial indicators of the real estate listed companies. Appropriate optimizations are according to the Formula (2) and (3).

**Calculation and analysis of Beta coefficient.** Beta data representing systemic risk are derived from the Reith Financial Database and the beta is calculated as follows (Liu 2016):

$$\beta = \frac{\operatorname{cov}(X_i, Y_i)}{\operatorname{var}(X_i)} = \frac{\sum (X_i - \overline{X})(Y_i - \overline{Y})}{\sum (X_i - \overline{X})^2}$$
(4)

From the Table 2 of beta coefficient of descriptive statistics, we can see that beta coefficient of average is 1.055, which is obviously deviates from 0, indicating that the properties of the real estate listed companies on the systemic risk is relatively high. The kurtosis of beta coefficient is 6.333, which is far greater than 0, the normal distribution; at the same time, the skewness of that is -1.996, which is lower than 0, indicating that the real estate listed companies system risk distribution is peak distribution and left skewness distribution (Suarez and Vassallo 2005).

### **Table 2.Descriptive Statistics.**

	N	Minimum	Maximum	Mean	Std. Deviation	Variance	Skewness	Kurtosis
Beta	111	0153	1.3768	1.055495	.2347744	.055	-1.996	6.333
	111							

# **EMPIRICAL ANALYSIS**

**Factor analysis.** First of all, we conduct a preliminary factor analysis. The results of the analysis show that the common degree of some financial indicators is less than 0.5; the KMO value is less than 0.6; the common factor is not easy to explain. Therefore, we gradually adjust the financial indicators and we finally selected 13 indicators including the Current Ratio.

Then we conducted factor analysis again. Kaiser (1974) pointed out that the criteria for judging the KMO statistic in factor analysis is: KMO in 0.9 is the best; above 0.8 is good; above 0.7 is moderate; above 0.6 is acceptable; more than 0.5 is sad; and less than 0.5 is not acceptable. According to Table 3 can be found, the value of the KMO statistic is 0.693, greater than 0.6 is acceptable. The value of Bartlett ball test was 1338.693, which was significant at 0.05 level. Comprehensive KMO and Bartlett ball test value can be known, the financial indicators can be screened out factor analysis.

### Table 3.KMO and Bartlett's Test.

Kaiser-Meyer-Olkin	Measure of Sampling Adequacy.	.693
Bartlett's Test of Sphericity	Approx. Chi-Square	1338.693
	df	78
	Sig.	.000

Table 4 is the common factor variance, and the most right side of the extraction is that the common factor is extracted to explain the total explanatory power of the measured variables. Tabachnica and Fudell (2007) think that when the extraction value is greater than 0.5, is a very good situation. And from the Table 3 can be found, we select the index of the financial indicators of the extraction most are more than 0.6, indicates that we select the index is more appropriate (Zhang and Xu 2010).

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	Initial	Extraction
ROE	1.000	.776
RA	1.000	.878
RI	1.000	.847
CR	1.000	.986
QR	1.000	.987
ER	1.000	.976
TPG	1.000	.573
GNA	1.000	.506
IT	1.000	.886
CAT	1.000	.923
DAR	1.000	.770
FCR	1.000	.707
ICR	1.000	.817
Extraction method: princ	ipal component analysis.	

### Table 4.Communalities.

Table 5 is the explanation of the total variance, which is to retain the cumulative variance contribution rate of the five common factors, from the table can be found to contribute to the rate of 81.777%, retaining most of the information of the original information. So I keep the 13 financial indicators can be integrated into 5 public factors. The last of the square of the rotation and the loading of a column is a representation of the importance of each common factor. Results are shown in the following table.

	Ι	nitial Eigenval	lues	Rotation S	Sums of Squar	ed Loadings
Component	Total	% of	Cumulative	Total	% of	Cumulative
	Total	Variance	%	Total	Variance	%
1	3.557	27.360	27.360	3.557	27.360	27.360
2	3.014	23.184	50.544	3.014	23.184	50.544
3	1.564	12.030	62.574	1.564	12.030	62.574
4	1.382	10.631	73.205	1.382	10.631	73.205
5	1.114	8.572	81.777	1.114	8.572	81.777
6	.770	5.922	87.699			
Extraction m	ethod: prin	cipal compone	ent analysis.			

### Table 5. Total Variance Explained.

The function of the structure matrix of Table 6 is to reflect the relationship between factors and variables, and is suitable for the naming of factors. We can found in the components of  $F_1$ : ROE, RA and RI are relatively high,  $F_1$  can be named as the profitability indicator; component  $F_2$  on CR, QR and ER are relatively high, named as solvency index; composition  $F_3$  on IT and CAT are relatively high, named for operational capability index.  $F_4$ , on which DAR, FCR and ICR are higher, named as the capital structure index; in component  $F_5$ , TPG and GNA is relatively high, named growth ability index.

			Component	t	
	1	2	3	4	5
ROE	.624	.589	.025	189	053
RA	.672	.643	084	042	055
RI	.673	.615	044	121	019
CR	.490	.770	.217	116	.001
QR	.313	.868	.156	086	.032
ER	.494	.885	.139	073	.028
TPG	.549	.423	.251	091	.544
GNA	.211	.362	004	291	.495
IT	.567	325	.519	.427	.082
CAT	.328	.133	.679	.577	.065
DAR	.054	.220	.579	.607	.124
FCR	.124	.172	.558	.567	170
ICR	044	.025	.152	.879	.086
Extraction	method: princi	pal component	analysis.		
a. Rotation	converged in 5	5 iterations.			

Table	6.Rotated	Component	: Matrix <sup>a</sup> .

# **REGRESSION ANALYSIS**

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We use five common factors which are results obtained by factor analysis and systemic risk beta coefficients for multiple linear regression analysis (Yuan 2015). The results are shown in Table 7 and Table 8.

Table 7.Anova <sup>®</sup> .			
Model	Sum of Squares	df	]

	Model	Squares	df	Mean Square	F	Sig.
1	Regression	.341	5	.068	1.253	.090 <sup>a</sup>
	Residual	5.722	105	.054		
	Total	6.063	110			

a. REGR factor score: 5 for analysis 1, 4 for analysis 1, 3 for analysis 1, 2 for analysis 1, 1 for analysis 1.

b. Dependent Variable: Beta.

According to the estimation results we can find: (1) From the overall model, regression model F-measure was 1.253 at the 0.1 level significantly. (2) From the view of the relationship between beta and respective variables: the profitability index

Table 8.Coefficients <sup>a</sup> .							
Model	Unstar Coef	ndardized ficients	Standardized Coefficients	Unstandardized	Sig.	Co linear sta	tistic
	В	Std. Error	В	COETHCIENTS		Tolerance	VIF
(Constant)	1.055	.022		47.637	.000		
REGR factor score	.036	.022	152	-1 .599	.013	1.000	1.000
1 for analysis 1							
REGR factor score	016	.022	.069	.726	.009	1.000	1.000
2 for analysis 1							
REGR factor score	.008	.022	.035	.369	.713	1.000	1.000
3 for analysis 1							
REGR factor score	035	.022	.149	1.572	.019	1.000	1.000
4 for analysis 1							
REGR factor score	017	.022	072	757	.451	1.000	1.000
5 for analysis 1							
a. Dependent Variable: Beta							

significantly, which passed our research hypothesis; the growth ability index and the operational capability index are not significant. correlated and the profitability index is positively correlated, which passed our research hypothesis; the solvency index at 0.05 level and the capital structure index in the 0.1 significance level significantly. In addition, the capital structure index is negatively

# CONCLUSION

of profitability index, capital structure index and solvency index on real estate company systemic risk is significant; (3) Growth ability found (1) The system risk distribution of real estate listed companies is peak distribution and left skewness distribution; (2) The impact regression models with five common factors and systemic risk indicators calculated by the capital asset pricing models, and the study including the profitability factor, the solvency factor and the growth ability factor, were extracted. We used multiple common linear financial data of the year 2015-2016, we selected 15 financial indicators to carry on the factor analysis, and 5 common factors, index and the operational capability index are not significant. In this paper, we used all the A-share real estate listed companies in China as the sample. Based on the micro-company's

### ACKNOWLEDGEMENT

This work was supported by the National Natural Science Foundation of China under Grant No.71531013; 71490720; 71401047.

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