A Study on the Influence of Corporate Income Tax on Investment of Real Estate Companies in China

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Abstract: In China, housing is one of the most heated issues among generations. Due to the high rise of demand of housing, real estate companies and its investment as well as its influential factor corporate income tax are always a focus of people's attention. This passage is to analyze the influence of corporate income tax on the investment of real estate companies by constructing a regression model, after which we can draw a conclusion that non-linear correlation exists between corporate income tax and investment of real estate companies. Regarding to this conclusion, relevant recommendations are proposed at the end of this passage.

1. Introduction

Throughout history corporate income tax has been attached great importance by government as well as entrepreneurs. During the recent National People's Congress and Chinese People's Political Consultative Conference, a NPC representative, Wang, proposed that corporate income tax in China should be reduced from 25 percent to 20 percent [1]. From his point of view, corporate income tax, which accounts for a larger proportion in total tax revenue than many developed countries, has the most impact on economic growth.

Many scholars have conducted researches and published papers on corporate income tax's impact. Based on workforce demand test, Wang et al. (2012) [2] prove that corporate income tax is a critical influence factor of workforce demand even though state controlling might weaken the influence. Wang et al. (2013) [3], by analyzing previous tax reform, claim that corporate income tax has dramatic influence on remuneration policy, widening the gap between the superior and ordinary employees after abolishing limit deduction policy. When it comes to new technology innovation, Yang et al. (2013) [4] carried out empirical analysis based on GEM listed companies, drawing a conclusion that income tax incentive policy significantly has promoted them to invest more in innovation and development activities.

Also, as an inevitable part of operation, investment and financing have aroused many scholars' interests to conduct researches on their influential factors. Xie et al. (2014) [5] analyze the influence

of macro monetary policy and the degree of regional financial development on investment and finance, focusing on listed companies' seasonal statistic between 2002 and 2012. Huang et al. (2013) [6] illustrate that companies with venture capital have higher investment ability than companies without it. Furthermore, Wu et al. (2012) [7] conclude that venture capital firm can improve external financing environment and promote standardization of companies financing.

In addition, real-estate industry, as a heated issue in China, have attracted many scholars. For instance, Chen et al. (2013) [8] analyze the relationship between monetary policy adjustment and financing decisions of real-estate corporations, proving that benchmark lending rate and reserve requirement ratio have negative effect on corporation's asset-liability ratio. Besides, the policy of replacing business tax with value-added tax has been paid attention to by Sun et al. (2015) [9], after which they not only analyze the influence of the policy on real-estate corporation's tax, but also the effect on net income. However, further research is still needed.

This passage, as a result, mainly focuses on the influence of corporate income tax of real-estate companies on investment decisions based on CSMAR data base. The structure is organized as follows. After introducing background information and various kinds of researches scholars conducted, the second part is to introduce data resources and conduct descriptive statistical analysis. Part three sets up multivariable linear regression model using selected variables. Part four is expected to draw a conclusion based on the analysis in previous parts, while recommendations are supposed to be shown in the last fifth part.

2. Data & Model

2.1 Data Resources

This passage regards real estate companies as research objects, based on the financial statements of listed real estate companies in A-share market. All of the sample panel data comes from CSMAR data base, in which there are 145 listed real estate companies while 130 of them are in A-share market. Since the new corporate income tax law is known to be implemented in 2008, the research period is supposed to be selected from 2008 to 2017.

According to previous research experience, the following data should be eliminated: (1) data of companies that has "ST" or "*ST" tag on them, for the reason that they have made a loss for two or three years and should be specially treated; (2) data of companies that are incomplete; (3) data of companies that their profit before tax or corporate income tax payable is no more than 0; (4) data of companies that their corporate income tax rate is lower than 0 or higher than 1. After the screening, 61 companies are selected, 610 sample observations of panel data are used.

2.2 Regression Model

In order to further verify the influence of corporate income tax on companies' investment, linear regression analysis should be applied to construct fixed effect model as follow:

$$\ln\_invest_{it} = \alpha + \beta_1 citr_{it} + \beta_2 scale_{it} + \beta_3 drr_{it} + \beta_4 far_{it} + \beta_5 car_{it} + \beta_6 fl_{it} + \beta_7 roa_{it} + \varepsilon_{it}$$

In the above model, α is intercept, i means the company selected, t means the financial year between 2008 and 2017, β represents the coefficient estimation value that calculated by panel data and ε means the error value. The above variables are defined as follow:

Table 1: Variables Definition

Variables	Definition	Signs	Proxy variable
Explained variable			
investment	Investment proportion in current financial year	ln_invest	The logarithm of money paid for fixed assets, intangible assets and other non-current assets
Explanatory variable			
Corporate income tax rate	The actual corporate income tax rate (ETR)	citr	Corporate income tax payable/ profit before tax
Corporate scale	The size of the corporates	scale	The logarithm of total assets at the end of current financial year
Deposit received rate	The proportion of the money received in advance	drr	deposit received/ total liabilities
Fixed asset rate	The proportion of fixed assets	far	net book value of fixed assets/ total assets
Cash asset rate	The proportion of cash and cash equivalents	car	cash and cash equivalents/ total assets
Financial leverage	The influence of financial flexibility	fl	earning before interests and tax/ earning before tax
Return on assets	The ability of making profit	roa	profit for the year/ average total assets

As it is shown in table 1, investment, which refers to the amount of money paid for fixed assets, intangible assets and other non-current assets, is the explained variable. In order to compare the number horizontally and vertically, the proportion of money paid for fixed assets, intangible assets and other non-current assets of total assets is used, instead of using the amount of money exclusively. Also, to better make comparison between companies as well as different years, the corporate income tax rate is used to be the explanatory variable. The amount of money that should be paid as corporate income tax is supposed to be divided by profit before tax.

When it comes to controlled variables, six main variables that have impact on the explained variable would have to be controlled in this passage. Generally speaking, corporate scale, deposit received rate, cash assets rate and return on assets have positive correlation with the investment of companies. The larger the number, the more investment they are likely to spend. On the other hand, fixed assets rate and financial leverage have negative correlation with the investment. These variables should be controlled during the analysis.

3. Results and Analysis

Table 2: Panel Regressions

	(1)	(2)	(3)
	r1	r2	r3
citr	-0.780		-4.067**
	(0.195)		(0.026)
ln_citr		-0.338**	
		(0.027)	
citr_sq			4.646*
			(0.056)
scale	0.960***	0.976***	0.959***
	(0.000)	(0.000)	(0.000)
drr	-0.526	-0.477	-0.477
	(0.258)	(0.303)	(0.305)
far	6.348***	6.295***	5.797***
	(0.000)	(0.000)	(0.000)
car	-1.356*	-1.361*	-1.289*
	(0.074)	(0.072)	(0.089)
fl	-0.040	-0.034	-0.030
	(0.725)	(0.764)	(0.795)
roa	3.565**	3.523**	3.745**
	(0.033)	(0.033)	(0.025)
_cons	-4.652*	-5.709**	-4.159
	(0.076)	(0.033)	(0.114)
Year	Y	Y	Y
R2	0.191	0.196	0.197
N	610	610	610

Several panel regressions were conducted to verify the correlation between the response variable and the explanatory variable. We use individual and time fixed effects model to exclude the time effect as well as the influences that do not change with time. In the first regression, I found that investment and corporate tax rate are negatively related. The p value is larger than 0.1 so it is not a significant linear correlation. When it comes to further analysis, it is quite possible that there is a non-linear correlation between the two variables. While testing with the square of corporate income tax, the lower than 0.1 p value indicates a significant quadratic correlation between investment and the square of corporate income tax. At the beginning, the investment is expected to drop with the decrease of corporate income tax, then it starts to increase while corporate income tax is also rising, which is approximately an U-shape.

The reason why the investment would experience such a U-shape could be various. The most possible hypothesis is that companies with lower corporate tax rate and companies with higher corporate tax rate have different sensitiveness towards investment. In the lower scale of corporate

tax rate, companies with lower corporate tax rate react strongly while companies with higher rate are numb to the increasing tax rate. In other words, the soar of corporate income tax rate has more negative effect on low-tax-rate companies compared with others. Thus, many low-tax-rate companies are willing to cut down on investment with the soar of corporate income tax rate.

However, when it comes to a considerably high level of corporate income tax rate, it might not be the principle inhibition factor to the investment. On the contrary, with the increasingly rising corporate income tax rate, opposite effect might be engendered. According to bidirectional economic effect game mechanism, income effect and substitution effect are the two kinds of influence that corporate income tax might have on investment. When corporate income tax makes impact on investment income, companies will give up some investment projects because of the decreasing attraction of investment so that substitution effect appears. In order to offset the lost, companies might develop more investment projects to recover the income level, which is called income effect. The investment depends on the game mechanism between the two effect. According to the coefficients we get from the regression, we find investment starts to rise when tax rate increases at the tax rate 57%, which is a really high tax level if the average level is only 25%. When corporates suffer so high income tax that they are no more sensitive to tax burden, how to earn more through investing will be their focus. Therefore, investment level might increase due to income effect.

In addition, the majority of controlled variables have significant influence on the response variable. Firstly, corporate scale has significantly positive influence on investment as empirical study has revealed that investment is more sensitive to cash flow in larger companies than smaller companies. Secondly, fixed asset rate is an essential influential factor in real estate companies. Generally speaking, the increase of depreciation will lead to the decrease of cost of capital, which is an impetus of investment. Also, the ability of making profit from it would be positively related. However, cash asset rate has significantly negative impact on investment. High cash asset rate could be a dangerous signal to real estate companies because it might reveal the low asset utilization rate of a company.

4.   Conclusion and Recommendations

To sum up, we can safely arrive at the conclusion that there is a significant quadratic correlation between corporate income tax and investment. Theoretically, we constructed a regression model and controlled several factors that might be quite influential. According to neoclassical theory and the economics analysis research conducted by Liu (2007), mathematical equation is used in this passage to present the four significant aspects that could have great impact on investment: tax rate, depreciation, investment deduct and interest deduction.

As for recommendations, controlling tax rate is an important access for government to managing the investment of companies. As we can see from the abovementioned assumption, low-tax-rate companies are more sensitive to the change of corporate income tax. If we are supposed to eliminate real state bubbles, tax rate should be set increased in order to discourage investment of low-tax-rate companies; otherwise, it should be reduced. When it comes to high-tax-rate companies, increasing tax rate is futile or even has opposite effect on them. It is vital to develop other controlling ways to manage the investment of real state companies. As a result, grading taxation and

differentiation control are indispensable.

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