Monetary Policy, Property Right and Overinvestment

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Abstract

The transmission mechanism of monetary policy to enterprise investment behavior is an indispensable part of investment theory, and the study of the effectiveness of monetary policy plays a very important role in controlling corporate overinvestment. Most of the existing papers explain the impact of overinvestment phenomenon from the micro point, combined with monetary policy to provide effective macro-planning for the high-quality development of enterprises. This paper uses GMM estimation to calculate overinvestment. This paper selects the financial data of the listed companies from 2007 to 2016 and studies that how the monetary policy impact the overinvestment from the perspective of the property right. The results show that the interest rate can inhibit the overinvestment of the companies, but under the nature of state-owned property rights, the inhibition will be weakened, which will reduce the effect of reducing the level of overinvestment through monetary policy.

Keywords

Overinvestment, Interest rate, Property rights, GMM estimation.

1. Introduction

The reports of the 19th CPC National Congress pointed out that China's economy had changed from a stage of high-speed growth to a stage of high-quality development, and China’s economy has entered a "New Normal" and is in the critical period of changing its mode of development, optimizing its economic structure, and transforming its growth power. The construction of modern economic system is the urgent requirement of crossing the gate and the strategic goal of our country's development. For a Long time, investment is the main "engine" of our economic growth. Especially after the international financial crisis in 2008, Chinese external demand growth was weak, and investment was the main force to stimulate economic growth. After 2008, the proportion of investment and GDP in China rise rapidly. In the current stage, the development of Chinese enterprises is uneven. Large enterprises such as listed companies are overinvested. According to "Agency Theory", managers often invest in projects with low efficiency, thus causing excessive investment. It will not only cause economic growth, but also lead to negative growth. On the contrary, small and medium-sized enterprises will face the project with financing difficulties, high risk, lack of funds and serious constraints on economic transformation. Overinvestment behavior is affected not only by the internal governance structure, but also by the external economic environment. At present, the vast majority of scholars focus on the internal factors that affect the investment efficiency of enterprises (Cheng Xinsheng et al.[1]; Li Yan et al.[2]), mainly including enterprise information disclosure, the independence of the board of directors, the background of managers, etc. However, there are few studies on the influencing factors at the macro level. Studying on the macroeconomic environment such as monetary policy, economic cycle and investment decision produces the serious split phenomenon.

Monetary policy is the most important macroeconomic means for a country to control the real economy. Under the background of economic transition in China, monetary policy is also the economic environment that enterprises face when they make financial decisions. From the aspect of

demand effect, the companies will judge and change the future investment decision according to the change of the return on investment. According to the traditional Keynesian Theory, the change of monetary policy will lead to the change of market interest rate, which will affect the cost of investment and alleviate the phenomenon of overinvestment. The nature of the property of the listed companies can be divided into state-owned listed companies and private listed companies. So different property rights' companies will have different effects on overinvestment. For companies with different property rights at present, it mainly focuses on the impact of monetary policy on investment opportunities. In view of the different enterprises' property rights, the influence of monetary policy on enterprise investment efficiency will be different. In areas where capital is relatively scarce, through state-owned enterprises with concentrated property right, increasing capital investment has remarkable effect on stimulating economic development. The government actively invests in inefficient investment projects, or even supplementary investment, which leads to excessive investment and soft budget constraints.

This paper mainly studies the influence of domestic monetary policy on the overinvestment of listed companies according to the differences of property rights. Its main purpose is to provide a feasible plan for the present situation of investment span of enterprises in our country, which that is large companies invest more or even always make ineffective investments, but small companies do not have the capital to invest. Let more capital flow to small and medium-sized enterprises with real demand, thus inject new vitality into the economic growth and realize the strategic goal of our country faster and better at the present stage.

The structure of this paper is arranged as follows: The second part reviews the domestic and foreign literature and puts forward the hypothesis of this paper; the third part selects the appropriate samples and variables to construct the model according to the hypothesis putted forward in the second part; The fourth part uses software operation to process data and verifies hypotheses; the fifth part summarizes and gives enlightenment of the research.

2. Literature Review and Theoretical Hypothesis

2.1 Literature Review

At home and abroad, the study of monetary policy and corporate investment is endless. The literature review of this paper mainly from the domestic and foreign to elaborate.

2.1.1 Foreign Related Research

Interest rates are the direct monetary transmission channel. Sanchita and Rina[3] have found that changes in interest rates have a strong impact on private investment and consumption through research in the Middle East and North Africa regions. The interest rate channel has become the main channel for monetary policy. Butzen[4] and so on, through the investigation of the investment behavior of Belgian companies under the influence of monetary policy, found that small firms were more sensitive to interest rates compared with large companies[5]. A study of the relationship between monetary policy and corporate investment in the UK in the 1970s and 1980s found that British firms' investment variance in the 1980s was significantly smaller than in the 1970s, indicating that the uncertainty of monetary policy have led to a convergence of investment behavior among firms. Gianni[6] studied Australian firms. It is found that the cost of capital use has an important influence on the investment decision of the company. In Asian countries, such as Nagahata[7], who mainly studied the investment behavior of Japanese enterprises. They found that monetary policy in Japan also changed other macro variables mainly through interest rates. Investments of companies without bond issuance were more affected. Berg Lof and Bolton[8] found that a large number of bank loans can not only support dynamic emerging enterprises in the process of economic transformation, but was also allocated to the production efficiency of state-owned enterprises.

Overseas research on overinvestment has been around for a long time. In 1986, when Jensen[9] demonstrated his theory of free cash under the premise of asymmetric information between shareholders and managers, he suggested overinvestment. Beatty A. etal.[10] and Chen C. etal.[11]

showed that peer exaggeration of earnings and better performance of peers both led to an increase in the size of the firm's investment in the same industry through research. In the investment activities of enterprises regulated by monetary policy, Qian, Y., G. Roland, and C. Xu.[12] suggested that the difference of government behavior motivation led to the difference of the effect of capital investment and the economic results, leading to the phenomenon of overinvestment. The general theory holds that the net present value of the investment project is the criterion that whether the enterprise investment is reasonable or not. If the net present value is positive, the investment is considered reasonable; on the contrary, the investment is considered as overinvestment. From the international point of view, there are two main methods to measure overinvestment: One is the econometric model of investment opportunity, cash flow and its interaction, which is constructed by Vogt[13]. The sample firm as a whole can be judged as overinvested by the symbol of the interaction coefficient. The second is the residual measurement model proposed by Richardson[14], which can be used to measure the degree of overinvestment of a particular company in a particular year. It has been applied in many domestic literatures on overinvestment.

2.1.2 Domestic Relevant Research

Domestic research on monetary policy has a long history. Wang Xuebiao and Wang Xiaoting[15], Song Wang and Zhong Zhengsheng[16], Liu Ming and Yao Xin[17], Li Hongjin[18] found that the adjustment of monetary policy with interest rate as a tool had significant effects on output, employment, inflation, savings, consumption and investment. This showed that interest rates were very important variables in the macro economy. By establishing VECM model, Zhao Qiurong[19] showed that monetary policy could stimulate investment more than consumption. Yu Kun, Li Zhiguo, et al.[20] adopt the consistency method. The empirical study showed that the more dependent on external financing, the greater gap between non-state-owned enterprises and state-owned enterprises. The interest rate transmission mechanism of monetary policy affected this gap. Under the framework of neoclassical investment theory, He Yan et al.[21] verified the heterogeneity effect of interest rate transmission mechanism of monetary policy from the perspective of investment opportunity and property right system. Tian Lihui's[22] research showed that the soft budget constraints of state-owned enterprises were the reason why Chinese debt leverage did not work. At this time, the adjustment effect of monetary policy on the financing cost and scale of state-owned enterprises will inevitably be affected through two channels of interest rate and credit. The soft budget constraints of state-owned enterprises destroyed the credit contract between financial institutions and enterprises based supply and demand in financial market, which led to mismatch of bank credit resources and inefficient investment of state-owned enterprises.

For private interests, blindly expanding the size of the company, managers can easily invest in projects with negative net present value (NPV) thus causing excessive investment. Under the framework of Agency Theory, Xin Qingquan and others[23] revealed the phenomenon of overinvestment in the listed companies controlled by local government when the contract compensation theory fails. Li Yunhe[24] believes that the phenomenon of overinvestment in Chinese enterprises is due to the abuse of enterprise resources and the overconfidence of managers. Li Wanfu and others[25] have shown that lower internal controls exacerbate overinvestment or underinvestment in companies. In the perspective of the configuration of enterprises' investment in China, Zhao Jing and others[26] showed that the higher the level of local government intervention is, the more easily the enterprise is to overinvest, the higher the level of the local financial development and legalization, and the more effective and effective suppression of overinvestment. In addition, the diversity of the property right control model and the degree of competition in the industry can lead to differences that the monetary policy affects enterprise investment. Private enterprises are not only in the state-owned economic system, but also mostly in the areas of low entry barriers and strong market competition. Therefore, the responses of investment activity to monetary policy adjustment is likely to be more rational and sensitive.

From the above literature, the study of monetary policy and overinvestment reveals the influence of interest rate transmission mechanism on investment from different angles. The study of

overinvestment is only discussed as a result, and it is not really combined with macro and micro variables. Based on the heterogeneity of enterprise property right, this paper studies the influence of monetary policy on overinvestment. This is of great significance for the state to adjust the phenomenon of excessive investment within enterprises.

2.2 Theoretical Hypothesis

Interest rate transmission mechanism is one of the main channels for monetary policy. According to Keynesian Theory, tight monetary policy will lead to higher interest rates, which will raise the cost of capital, reduce investment, curb economic growth, and thus reduce the level of overinvestment. Therefore, we propose the first hypothesis:

H1: When other conditions remain unchanged, interest rates are inversely correlated with the level of overinvestment of the company.

However, monetary policy is influenced not only by endogenous factors such as interest rate, but also by exogenous factors such as institutional environment. In China, which is in the "new normal" of economy, because of the influence of the early planned economy, government intervention in the production development of enterprises is a major feature of Chinese companies. Tang Xuesong[27] proposed that in order to pursue higher GDP, local governments would intervene in the development of local enterprises, which would lead to excessive investment. State-owned enterprises have soft budget constraints in the face of investments. When faced with financial difficulties, state-owned enterprises tend to show greater risk bias in their investments due to government guarantees. Well, in face of tight monetary policy, state-owned enterprises are likely to overinvest despite higher capital costs. However, the non-state-owned enterprises will be affected by the goal of profit maximization, which will be measured between cost and income, and deeply influenced by monetary policy. Therefore, the following assumptions are made:

H2: When other conditions remain unchanged, overinvestment in state-owned enterprises is less sensitive to changes in monetary policy.

3. Research Design

3.1 Sample Selection and Data Resources

This paper selects the data of A-share companies from 2007 to 2016, and the data are processed as follows:

(1) Excluding the samples of listed companies in the financial industry;

(2) Excluding listed company samples with missing or discontinuous financial data;

(3) Winsorize processing is performed on 1% and 99% level of other relevant variables except the dummy variables in the model. Through the above criteria, we can obtain the observation data of 1759 samples.

Data mainly come from Wind and CSMAR database.

3.2 Model Design and Variable Definition

This paper mainly uses the following models to measure the influence of monetary policy on overinvestment under the condition of heterogeneity of property rights:

$$\text{Overin} = \lambda + \alpha I + \beta Control + \phi I * Soe + \varepsilon \quad (1)$$

In the model, ‘Overin’ represents the overinvestment level of listed companies; ‘I’ as the interest rate, measures the change of monetary policy; ‘λ’ is on behalf of the fixed term of the regression equation; ‘Control’ represents other control variables, and ‘ε’ is the residual error obtained by regression. Considering the influence of property, ‘Soe’ represents property rights. The exact explanation for the variable is as follows.

3.2.1 Overinvestment

To measure the overinvestment of enterprises, this paper refers to the definition of Tian Suyuan[28].

The quantitative research on overinvestment of enterprises follows the model of Richardson and estimates the normal capital investment level of the enterprise. It uses the difference between the actual capital investment and the estimated capital investment level to measure the excessive investment in the enterprise. The excess investment is negative and the investment is insufficient. The formula is as follows:

$$Invest_t = \beta_0 + \beta_1 Growth_{t-1} + \beta_2 Lev_{t-1} + \beta_3 Size_{t-i} + \beta_4 Cash_{t-1} + \beta_5 \mathrm{Re}t_{t-1} + \beta_6 Invest_{t-1} + \sum Year + \varepsilon \quad (2)$$

Among the variables, 'Invest$_t$' is a new investment in t year, and it is measured by the difference between t and t-1's original value of fixed assets divided by total assets; 'Growth$_{t-1}$' is the growth level in t-1 year in terms of operating income growth rate. 'Lev$_{t-1}$' is the leverage ratio of t-1 year and is measured by assets-liability ratio at the end of t-1 year;'Size$_{t-1}$' represents the scale of the company, which selects the natural logarithm of total assets at the end of t-1 year. 'Cash$_{t-1}$' is the proportion of current assets in t-1 year and 'Ret$_{t-1}$' is the proportion of owner's equity in t-1 year. '∑Year' is the virtual variable of year to control the fixed influence of time factor.

3.2.2 Property Right

This paper sets the dummy variable to the property right, in which the state-owned enterprise is 1, the non-state enterprise is 0. In this paper, the state-owned proportion of 10% as the demarcation point.

3.2.3 Interest

With the development of interest marketization, interest has more and more influence on our country's inefficiency investment. Yang Zheng, Liu Fang[29] proposed that opening the lower limit of loan interest rate is more helpful to restrain the inefficient investment. Therefore, this paper adopts the one-year loan interest of the sample interval year.

3.2.4 Other Control Variables

According to the literature of Tian Suyuan, the control variables in this paper are as follows:

Company size 'Size'; Financial leverage 'Lev'; Growth level of country 'Growth'; Free cash flow 'Cash'; Owner's equity ratio 'Ret'; and dummy variable 'Year'.

4. Empirical Results and Analysis

According to the formula, GMM estimation is used to calculate the overinvestment. The standard GMM estimation is proposed by Arellano M., Bond S.[34] and Arellano M., Bover O.[35]. Because there is the first-order lag term of the new investment in the formula, we can't use the general regression to calculate the overinvestment. After introducing the dummy variable to represent the year, we can find out the overinvestment of the target company.

4.1 Descriptive Statistics

According to the results of GMM estimation, we have obtained 17859 observations. Table 1 shows the descriptive results. The dividing point of 'Soe' with an average of 0.108 between state-owned enterprises and non-state-owned enterprises in this paper is 10. Therefore, about half of the sample companies are state-owned enterprises. The average value of 'Overin' is -0.916, which indicates that in the sample observation data, the phenomenon of overinvestment is not obvious, and the standard deviation is large, which indicates that the difference of overinvestment exists among the sample companies. Additional investment needs to be discussed further. 'Invest', whose average value is -1.465 and the standard deviation is 29.44. The growth level of the new investment is 0.361, expressed by the growth rate of operating income, and the average of 'Lev' is 0.576; The average value of 'Size' is 21.87. 'Cash' as the proportion of current assets, whose average value is 0.551, and the average value of 'Ret' is 0.481.

Table 1. Descriptive Results

	(1)	(2)	(3)	(4)	(5)
VARIABLES	N	mean	sd	min	max
Growth	17,859	0.361	11.87	-1	1,497
Lev	17,859	0.576	2.291	-0.195	142.7
Cash	17,859	0.551	0.225	0	1
Invest	17,856	-1.465	29.44	-2,261	0.937
Size	17,856	21.87	1.460	10.84	28.04
Ret	17,515	0.481	0.207	0.000542	0.991
e	15,735	-0.916	6.086	-238.7	17.85
Soe	1,786	0.108	0.310	0	1

(Continued)

4.2 Correlation Analysis

In the Table 2, the star-marked data is more significant in the correlation coefficient between variables. The upper level data refers to the correlation coefficient value between variables, so as to judge the correlation between variables; the following corresponding value is P value, which is to test the significance of the correlation data. From Table 2, we can see that the correlation coefficient between 'Overin' and other variables is significant. The company size, financial leverage, operating income growth rate, free cash flow, owner's equity ratio are positively correlated with overinvestment. The correlation coefficient between interest rate and overinvestment is -0.0117, which also confirms "H1" and is significant at a significant level of 5%.

Table 2. Variable Correlation Analysis

	Growth	Lev	Cash	Size	Ret	Overin	I
Growth	1.0000						
Lev	-0.0012	1.0000					
	0.8745						
Cash	0.0181*	0.0105	1.0000				
	0.0156	0.1625					
Size	-0.0119	-0.1272*	-0.1392*	1.0000			
	0.1133	0.0000	0.0000				
Ret	-0.0155*	-0.9561*	0.0202*	-0.3740*	1.0000		
	0.0396	0.0000	0.0076	0.0000			
Overin	0.0180*	0.1613*	0.2869*	0.5996*	0.2531*	1.0000	
	0.0239	0.0000	0.0000	0.0000	0.0000		
I	0.0120	0.0229*	0.0117	-0.2185*	-0.0345*	-0.0117*	1.0000
	0.1093	0.0022	0.1176	0.0000	0.0000	0.0000	

4.3 Empirical Analysis

Table 3 shows the regression results of model (1). The fixed effect model is used to estimate the parameters of the model. Table 3 examines the effects of interest rate on overinvestment under the condition of heterogeneity of property rights, in which (I) is the regression result of financial control variables, such as company size, leverage ratio, etc. The coefficient of interest rate overinvestment to the company is -0.238, and the coefficient of interest rate overinvestment to the company is -0.204 in result (II), and reaches a significant level of 0.1%. It shows that the interest is negatively related to the overinvestment level of the company. This supports the "H1".

In order to test the effect of property right on the overinvestment, this paper adds 'I*Soe', which is the cross term between interest rate and fictitious variable to study the property right. In Table 3, after adding the control variable of financial index of listed companies, the regression coefficient of 'I*Soe' is -0.313, which is significant at 0.1% level, and the regression coefficient is -0.218 in (II), reaching a significant level of 5%. The above data indicate that the nature of state-owned property right inhibits the influence of interest rate on the level of overinvestment, which supports "H2".

Table 3. Property Right, Interest and Overinvestment

	(I) Overin	(II) Overin
I	-0.238***	-0.204***
	(-7.21)	(-6.39)
I*soe	-0.313***	-0.218*
	(-3.42)	(-2.23)
growth		0.00289
		(0.43)
lev		0.161
		(0.33)
cash		4.731***
		(20.41)
size		-1.304***
		(-31.30)
ret		0.954
		(1.81)
_cons	26.19***	-1.953***
	(23.45)	(-11.19)
N	15679	15735

t statistics in parentheses
* p<0.05, ** p<0.01, *** p<0.001

4.4 Robustness Test

In this paper, the investment efficiency of enterprises is measured based on the Richardson's estimation model. In addition, some domestic and foreign studies often use Tobin Q to measure the growing opportunities of enterprises when estimating the investment efficiency. In this paper, the growth rate of main business income is used to replace Tobin Q to prevent overstatement of growth. In order to test the results of investment efficiency variables, this paper changes the growth variables of enterprises into Tobin Q when estimating the investment efficiency of enterprises. The regression results are consistent with the previous studies in terms of significance level and coefficient.

5. Research Conclusions and Enlightenment

This paper mainly studies the influence of macro variables on overinvestment, and analyzes the companies with different property rights under the special institutional environment of our country. This paper uses A-share listed companies' data. Through data processing, model setting, regression analysis and validation hypothesis, I make main conclusions of this paper: One is interest are

inversely correlated with the level of overinvestment of the company; the other is the reduction of overinvestment in state-owned enterprises by the tight monetary policy is not significant.

There was a lot of information during the 2018 Two Sessions, but it is not hard to see that the policies are all around one goal: to promote high-quality development. The phenomenon of overinvestment in enterprises is undoubtedly a stumbling block to the development of high-quality enterprises. This paper puts forward a theoretical method to solve this problem. Research on excessive investment not only benefits the country, but also promotes the healthy and high-quality development of enterprises.

However, there are still many shortcomings in this paper. The tight-money policy can only have a significant impact on the phenomenon of excessive investment in non-state-owned enterprises, but for state-owned enterprises, the impact is not significant due to the existence of soft budget constraints. There is no practical method to solve the problem of overinvestment in state-owned enterprises. What's more, this paper mainly deals with the problem from the macro level, and does not discuss it in the micro or other aspects. There is also no explanation for the overinvestment brought about by the management agency problem.

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