

Monetary Policy and Enterprise Investment Efficiency: Perspective from Enterprise Financing Constraints

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Abstract. Combining theoretical analysis and empirical research, this paper constructs a theoretical framework for the threshold model on the basis of a review and classification of relevant documents, for instance the empirical study on the existence of monetary policy bank credit channels and the study on the micro transmission mechanism of China's monetary policy credit channels. Based on the actual situation in China and the current state of China's enterprise financing policies, financing constraints, and investment efficiency, this article selects the data of listed companies in China from 2015 to 2021, chooses the balanced panel data as the research object, and obtains 8745 samples from 11624 samples via the balanced panel processing. The empirical analysis of descriptive analysis and regression analysis indicates that when the national monetary policy is maintained at a permissive level, the efficiency of SME joint investment portfolios may be considerably enhanced. In the future, the main monetary policy objectives when China is implemented should be scientifically formulated according to the main characteristics of the behaviors of microeconomic subjects in different industries as much as possible, and a differential monetary policy more suitable for "targeted" development should be adopted to maximize the effect of economic policy, so as to effectively promote the rapid and healthy growth and progress of small and medium-sized enterprises and the stable, sustainable and coordinated development of regional economic development.

Keywords: Monetary Policy; Financing constraints; small and medium-sized enterprises; Investment efficiency.

1. Introduction

1.1 Research Background

The research on the development and changes of macroeconomic policy variables and the dynamic impact on the interests of microeconomic participants has always been the focus of political economy research. Since the global financial crisis occurred in 2007 and triggered a new round of global large-scale economic decline, local governments in various countries have generally begun to adopt a series of economic policies, actively and appropriately intervening and controlling their local economies. In recent years, China's economic growth has tended to slow down under the positive influence of the objective international environmental situation. Moreover, under the macro background of China's relatively underdeveloped domestic capital market, small and medium-sized enterprises (SMEs) still face serious market financing difficulties due to their particularities, limiting and affecting their development to a certain extent [1]. To maintain the health and development of investment, large enterprises need to have a reasonable and sufficient return on the investment fund, be good at formulating scientific goals and appropriate long-term investment strategic plans, and continuously improve the overall investment operation efficiency in practice. Similarly, SMEs also need to improve the efficiency of their investment behaviors in practice. The monetary policy is a crucial adjustment tool to achieve the national macroeconomic goals and control the overall situation; if the monetary policy environment is significantly reversed in the future, what direct impact will it have on the binding credit financing structure and the efficiency of effective investment of the majority of SMEs? Simultaneously, what are the obvious differences between the structural changes of the monetary policy cycle and the economic impact on high-quality SMEs at different levels of loan ownership structure? By contrasting and examining the apparent effects of recent monetary policy changes on the degree of financing leverage constraints of various SMEs and the formation of loan investment

structure efficiency, researchers can further clarify the micro transmission path of monetary policy transmission [2].

1.2 Literature Review

Many literatures have investigated and studied the micro monetary policy, the restrictive effect of financing channels, and domestic enterprises' overall investment output efficiency. However, most still choose the listed companies of all enterprises in the country as the main object of investigation and research. Therefore, the analysis results of these literature surveys may not be applicable to small and medium-sized enterprises because they have phased development characteristics. The significant contribution of this paper is that it takes the domestic economy of SMEs as an essential research object, takes the dynamic changes of monetary policy systems in various countries, and the constraint effect of micro-financing channels of SMEs. This paper takes the macro investment efficiency as a relatively complete and systematic policy research chain system to conduct in-depth research, expands a series of relevant empirical research theoretical literature, and provides new research evidence for exploring the transmission effect of monetary policy orientation. The empirical results presented in this paper can be used as a reference for Chinese monetary policymakers to study and influence the investment operations of small and medium-sized enterprises.

In the context of the "new normal" of the economy, efficiency has gradually become the focus from quantity to quality, from expanding the scale to optimizing the structure. Modigliani and Miller, two American economists, developed the MM theory in capital cost, corporate finance, and investment theory, laying the theoretical groundwork for further research on financing restrictions and corporate investment. According to the theory, in a perfect capital market there is no correlation between the investment and financing activities of the company, there are no restrictions on financing, and there is no difference in the time and financial cost paid by enterprises to get internal and external financing [3]. China is in a critical period of economic transformation, and the capital market does not yet have the conditions for an effective market. The specific system and market environment mean that the macroeconomic environment has an important direct impact on China's capital market, and even on the investment behavior of enterprises. After the global financial crisis triggered by the U.S. subprime mortgage crisis, the Chinese government issued a variety of macroeconomic policies and measures to help enterprises overcome the difficulties brought about by fiscal and monetary policies. Through market interest rates and other transmission factors, it eased the supply difficulties of enterprises, and laid the foundation for smoothly emerging from the crisis and restoring market vitality. Since then, the impact of market capital constraints and other factors in the economic environment on enterprise investment efficiency has again attracted the attention of all departments. As a milestone, China's economic growth rate has changed significantly since 2008, slowing down from an average annual growth rate of 9.56%. According to the data of the Bureau of statistics, China's economic growth rate in 2019 was 6.1%, the lowest since 1990. China's economy is characterized by obvious cyclical fluctuations. Now, China and the world have entered the economic downturn cycle after the epidemic. Many people once again pay attention to how China, as the only major economy with positive economic growth in 2020, can cope with the negative impact of the economic downturn [4]. China has had a V-shaped recovery in all sectors of the economy due to effective national and local stimulus policies, and its economic forecast for the next decade is favorable [5]. Macroeconomic policies will ultimately play their role through micro enterprises. Therefore, it is necessary to clarify the role of macroeconomic fluctuations on enterprise behavior and the transmission path of macroeconomic policies affecting enterprise investment efficiency, so as to understand the key role of government policies in smoothing economic fluctuations and effectively managing market behavior.

2. Analysis on the Current Situation of Monetary Policy and Investment Efficiency

2.1 Development Overview

Monetary policy mainly refers to the monetary authorities' attempt to increase the economic ability to affect the changes in international interest rates by appropriately controlling money and gradually changing the level of nominal money supply, and making money available will affect investment demand and total demand. M2 growth rate is one of the two main growth goals of China's current monetary policy framework [6]. At present, other basic monetary policy tools and categories available to the central bank in the last three quarters are open interest rate and market reverse transaction interest rate operations, deposit reserve planning tools, and short-term deposits and reemployment pledge refinancing. With the steady expansion of the country's present cooperation in the integration of regional economic structure in China and the formation of an international financial market system, monetary policy tools and required means gradually tend to be relatively diversified. M2 currency comes directly from the base currency, so the central bank can be regarded as directly changing the base multiplier relationship of the intermediate currency and the base currency multiplier relationship to achieve the goal of directly affecting the intermediate base currency.

With the continuous emergence of the "double surplus" of China's current account and capital account, the central bank has to purchase a large amount of foreign exchange under the compulsory foreign exchange settlement and sales system. The scale of the foreign exchange account has grown rapidly and has become the main channel of basic capital supply. In China, the main factors affecting the money multiplier are the deposit reserve ratio and inflation rate. By adjusting the deposit reserve ratio, the actual money supply can be directly affected [7].

2.2 The Tightness of China's Monetary Policy

The easing of monetary policy is directly reflected in the growth of M2. At the end of 2007, the stock of M2 exceeded 100 trillion yuan, and increased to 182.60 trillion yuan at the end of March 2013. The compound annual growth rate is 14.62%, and monetary expansion is very rapid [8]. When the global financial crisis erupted in 2008, the Chinese government enacted a relatively lax monetary policy to support the economy, and thus the M2 growth rate peaked in 2009 at 28.52%. With the normalization of the economy, M2 growth slowed down.

2.3 The Impact of Monetary Policy on the Efficiency of Business Investment

The main objective of monetary policymakers is to affect business organizations' credit and investment behavior through monetary and credit mechanisms. The two main investment interest rate channels for monetary interest to transfer funds are generally considered to be borrowing, which means that the central bank changes the nominal interest rate of the loan currency according to the requirements of the current monetary policy, thus changing the actual nominal investment loan interest rate of bank funds through indirect means, which affects the actual total debt capital cost of banks within the entire financing enterprise system. Significant abnormal changes in the interest rate curve of the enterprise's capital cost will eventually lead to significant changes in the interest rate of its entire economic investment and financial activity structure, and these financial and investment operations and investment activities will inevitably become more sensitive and complex to the enterprise's capital interest rate curve, which will further directly affect the total financing currency demand of financing enterprises and the actual capital interest output of total financial liabilities. The exchange rate transmission channel of monetary policy means that the change of interest rate will lead to the change of exchange rate, which will affect the level of exports, imports and total output.

Credit channel is a quantitative transmission mechanism, including bank credit and balance sheet flow. The balance sheet reflection channel of monetary policy loans generally refers to the actual impact of the bank's monetary policy means on the borrower's current financial situation in terms of

other current assets, cash flow statement and cash net assets, which affects the level of bank loans, thereby affecting investment activities.

2.4 The Impact of Monetary Policy on Enterprise Investment Volume

The main impact of monetary policy is the change of capital cost and short-term enterprise cash flow. The interest rate will directly reflect the indirect impact of monetary policy variables. In accordance with the permissive monetary policy, when the market expectation is good, the capital cost is low, so the enterprise will obtain more cash flow, less interest payment and more net cash flow in the future; On the contrary, under the tight monetary policy, the interest rate rises, the net cash flow decreases, the projects that enterprises can invest in decrease, and the amount of investment decreases.

2.5 Monetary Policy Changes the Business Environment and Expectations of Enterprises

Changes in monetary policy have an impact on the macroenvironment of business investment spending and financing. Investment is a transitional process from input to output, so enterprises will actively change the current investment behavior to anticipate future demand changes. Loose monetary policy promotes the reduction of capital cost, the improvement of demand expectation, the rise of stock price and the increase of consumer demand, which in turn promotes the investment willingness of enterprises and the increase of the number of projects that can be invested. The expansion of debt financing brought about by monetary easing undoubtedly provides financial support for investment for enterprises and promotes the smooth progress of investment activities.

3. Design of Research

3.1 Source of Data and Sample Selection Method

The data for China's Listed Companies from 2015 to 2021 is collected. Companies having a listing year greater than and equal to 0 in 2015 are chosen as the study object, and 11624 samples are collected. The threshold model is selected for research in this paper. The research experiment needs to select the balanced panel data as the research object, and 8745 samples are obtained from 11624 samples by balanced panel processing. The annual reports of publicly listed companies and the CSMAR database are the exclusive sources of data.

3.2 Variable Selection and Meaning Interpretation

3.1.1 Explained Variable

This research use the Richardson (2006) methodology to evaluate the investment efficiency of the company [9].

$$\begin{aligned} \text{Inv}_{i,t} = & \beta_0 + \beta_1 \text{Growth}_{i,t-1} + \beta_2 \text{Lev}_{i,t-1} + \beta_3 \text{Cash}_{i,t-1} + \beta_4 \text{Lage}_{i,t-1} + \beta_5 \text{Size}_{i,t-1} + \beta_6 \text{Ret}_{i,t-1} \\ & + \beta_7 \text{Inv}_{i,t-1} + \sum \text{Industry} + \sum \text{Year} + \varepsilon_{i,t} \end{aligned} \quad (1)$$

Inv is a new investment equal to the difference between the amount paid in the current year for the purchase and construction of fixed assets, intangible assets, and other long-term assets and the amount received from the sale of fixed assets, tangible assets, and other short-term assets divided by the total assets in the current year. The term "Growth" refers to the rate of increase in operating revenue. Lev is the asset debt ratio. The quotation period is referred to as the Lage. Size refers to the size of the business. The profitability of stocks is referred to as Ret. ε is a random alarm item.

3.2.2 Explanatory Variables

The proxy variable for financing constraints is the KZ index introduced by Kaplan and Zingales (1997). The greater the value of the KZ index of listed enterprises, the more the financing constraints listed enterprises suffer [10].

3.2.3 Control Variables

In this paper, 6 variables are selected as the control variables of the model, namely Operating income, Asset liability ratio, Years of listed company, Company size, ROE, Monetary policy tightness. The specific definitions of the control variables are shown in Table 1.

Table 1. Control variables and meaning

Variables' Name	Meaning
Operating income	Net operating income of listed company/ Total assets
Asset liability ratio	Total assets/ Total liabilities of listed company
Years of listed company	Current year minus listed year of listed company
Company size	Take logarithm of total assets of listed company
ROE	Return on net assets
Monetary policy tightness	The M2 broad money supply growth rate is used to quantify the degree of monetary policy easing

3.3 Model Building

To further investigate the intricate link between financing constraints and investment efficiency, a threshold model is constructed, taking financing constraints as threshold variables to explore the nonlinear relationship between the two.

$$Invest_{it} = \alpha_i + \beta'_1 Financingconstraints_{it} I(Financingconstraints_{it} \leq \gamma_1) + \beta'_2 Financingconstraints_{it} I(Financingconstraints_{it} > \gamma_1) + \beta'_3 Tightness_{it} + \beta'_4 \Sigma x_{it} + \varepsilon_{it} \quad (2)$$

Among them, invest represents the investment level, intensity represents the degree of monetary policy easing, financingconstraints represents financing constraints, and X represents each control variable.

3.4 Empirical Result Analysis

3.4.1 Descriptive Analysis

The descriptive statistics for 8745 samples are shown in Table 2. The variables selected in the analysis process are: Investment efficiency, Financing constraints, Business income, ROE, Asset liability ratio, Listing period, Company size, and Tightness of monetary policy.

Table 2. Results of Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Investment efficiency	8745	-.086	.136	-.324	.153
Financing constraints	8745	.314	.075	.008	.794
Business income	8745	.548	.293	.026	2.038
ROE	8745	.045	.425	-14.281	.604
Asset liability ratio	8745	3.719	3.048	1.008	36.225
Listing period	8745	6.529	2.539	0	11
Company size	8745	22.301	1.187	19.29	27.961
Tightness of monetary policy	8745	.099	.017	.082	.133

On the basis of descriptive statistics, a regression analysis model was constructed to examine the relationship between investment efficiency and various factors; the outcomes are shown in Table 3.

Table 3. Benchmark regression results

Investment efficiency	
Financing constraints	0.943*** (0.06)
Business income	-0.05*** (0.013)
ROE	-0.01 (0.011)
Asset liability ratio	-0.003* (0.002)
Listing period	-0.001 (0.002)
Company size	-0.005 (0.003)
Tightness of monetary policy	-0.028 (0.216)
_cons	-0.229*** (0.075)
Observations	8745
R-squared	0.257

* p<0.1 ** p<0.05 *** p<0.001

According to the outcomes of the regression, there is an explicit positive linear correlation between financing constraints and investment efficiency, which indicates that financing constraints rise by 1 unit and investment efficiency increases by 0.943 units.

3.4.2 Analysis of Threshold Regression

Table 4's findings reveal that the model's single threshold result is statistically significant; hence, the single threshold model is selected as the research framework in this paper.

Table 4. Threshold model test results

Model	inspection type	F Value	critical value		
			10%	5%	1%
Threshold model	Single threshold	28.379	12.758	15.334	16.278
	Double threshold	5.027	14.381	17.973	22.587
	Three threshold	13.578	16.485	19.576	25.473

* p<0.1 ** p<0.05 *** p<0.001

As shown in Table 5 and Figure 1, with the change of financing constraints, when financing is less than 0.0435, financing constraints have a dominant positive linear effect on investment efficiency. When the change of financing constraints is greater than 0.0435, the effect of financing constraints on investment efficiency becomes negative, but not significant.

Table 5. Analysis results

VARIABLES	Investment efficiency
Business income	-0.067** (1.97)
ROE	0.087** (2.09)
Asset liability ratio	-0.070** (2.48)
Listing period	-0.095* (1.67)
Company size	0.057*** (6.72)
Tightness of monetary policy	0.082** (2.06)
Financing constraints (Financing constraints $\leq\gamma_1$)	0.348*** (9.851)
Financing constraints ($\gamma_1 < \text{Financing}$ constraints)	-0.007 (-0.78)
Constant	0.096*** (4.37)
threshold γ_1 Estimated value	0.0435
Observations	8745
R-squared	0.298

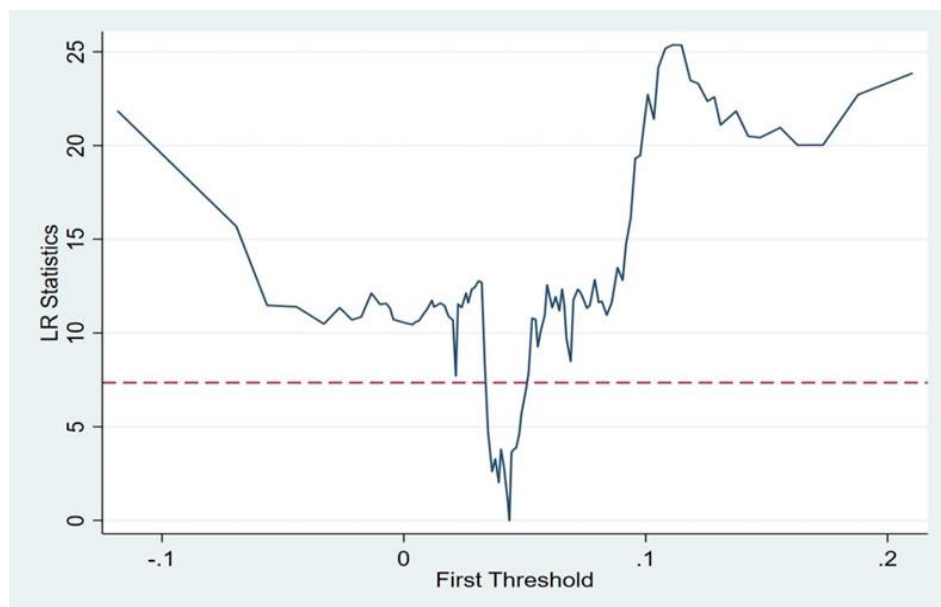


Fig. 1 Threshold inspection diagram

4. Conclusion

In view of the basic economic situation in China, the low efficiency of actual investment and operation of enterprises is also a common phenomenon. Monetary policy is a common and effective means for us to regulate and control the social and economic structure. Financial policy constraints

are still a major effective source of funds for the current operation of enterprises. Studying the actual impact of the current monetary policy orientation on the low investment and operation efficiency of enterprise entities at this stage is expected to improve the overall investment operation efficiency and quality of enterprises and enhance the effectiveness of monetary policy instruments.

This research examines the impact of monetary policy and financing constraints on the investment efficiency of enterprises, beginning with China's monetary policy. The research demonstrates that a nonlinear correlation exists between financing constraints and investment efficiency using the threshold model. However, neither the variety of enterprise types nor the disparities between businesses from various sectors were analyzed in this paper. Only from the overall perspective, it was verified that with the increase of financing constraints, the positive promotion of financing constraints on enterprise investment efficiency is no longer obvious. It is hoped that in the future, based on the current situation of this research, readers will further explore the profound impact of financing constraints faced by enterprises in different industries and different natures on their investment efficiency. And further explore the deeper mechanism analysis between financing constraints and enterprise investment efficiency.

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