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A Study on the Impact of Financing Constraints on Inefficient Investment Behavior of Listed Firms

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Abstract: *Financing constraints, as one of the key factors affecting the investment decisions of listed enterprises, are directly related to the inefficient investment behavior of enterprises in terms of their existence and degree. In order to analyze the influence mechanism of listed enterprises' inefficient investment behaviors, a study on the influence of financing constraints on listed enterprises' inefficient investment behaviors is proposed. Combined with the information asymmetry theory, the SA index is used as a proxy variable for financing constraints, and a multiple linear regression model is constructed to test the impact of financing constraints on the inefficient investment behavior of listed enterprises. The empirical results show that financing constraints significantly exacerbate the inefficient investment behavior of listed enterprises, which is mainly manifested as underinvestment; while in a relatively loose environment of financing constraints, although enterprises may obtain more investment opportunities, they may also lead to overinvestment due to overconfidence or agency problems.*

Keywords: *Financing Constraints; Listed Firms; Inefficient Investment; Impact Studies; Empirical Studies*

1. Introduction

The existence of financing constraints stems from the imperfect nature of capital markets, especially the prevalence of information asymmetry and agency problems. According to the MM theorem, in a perfect market, firms' internal and external financing can be perfectly substituted with the same cost. However, the reality is far from that. Information asymmetry makes it difficult for external investors to accurately assess the true value and investment risk of a firm, thus demanding higher risk premiums and leading to higher external financing costs. At the same time, agency problems also make corporate management deviate from the goal of maximizing shareholder value and make irrational investment decisions out of personal self-interest. For listed firms, the impact of financing constraints is particularly significant[1]. Financing constraints limit firms' sources of capital, which may prevent firms from seizing investment opportunities with positive NPV and lead to underinvestment. At the same time, financing constraints may also prompt firms to rely excessively on internal funds and overinvest in order to maximize short-term profits. Both of these inefficient investment behaviors can harm the long-term value of the firm and reduce investment efficiency[2]. By revealing the impact mechanism of financing constraints on the investment behavior of enterprises, this study can help enterprises identify the sources and manifestations of financing constraints so as to formulate more effective financing strategies and investment decisions.

In recent years, scholars at home and abroad have conducted extensive and in-depth research on the relationship between financing constraints and enterprise investment behavior. These studies mainly focus on the following aspects: first, the causes and influencing factors of financing constraints; second, the impact of financing constraints on the scale of enterprise investment, investment structure, and investment efficiency; and third, how to alleviate financing constraints in order to improve enterprise investment efficiency[3]. However, there are still some shortcomings and limitations in the existing research. For example, no agreement has been reached on the measurement method of financing constraints; the complex mechanism between financing constraints and the investment behavior of enterprises has been less explored; and the differences in the financing constraints and investment behaviors of enterprises of different ownership systems, industries or scales have not been studied in depth.

This paper adopts a variety of financing constraint metrics for comprehensive analysis to improve

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the accuracy and reliability of the study[4]. By constructing an empirical model for quantitative analysis, this paper reveals how financing constraints lead to the occurrence of inefficient investment behaviors by affecting enterprises' capital raising, investment decisions and risk management.

2. Conceptual definition and theoretical basis

2.1 Financial constraints

Financing mainly includes endogenous financing and exogenous financing, of which, endogenous financing refers to the enterprise's use of its own funds for financing, and at the same time, as the cost of endogenous financing is lower than that of exogenous financing, the majority of enterprises will choose to use their own internal funds[5]. Exogenous financing refers to the enterprise's use of its own existing conditions to external economic agents to raise and obtain funds, including the bank to apply for loans, to institutions or individuals to issue shares or bonds to raise funds, etc., most of the enterprises by the scale and profitability of the impact of their own funds are insufficient, and thus have to choose the exogenous financing.

The classical MM theory proposes that in a perfect capital market, there are no transaction costs and bankruptcy costs, and firms are able to obtain the funds they need at a reasonable price, so that external funds can completely replace internal own funds, and in such a case, the investment behavior of firms will only be affected by internal decision-making and not by financing behavior. However, the capital market is not perfect, and according to the theory of eudaimonic financing, it can be clear that enterprises will be subject to financing constraints due to the existence of information asymmetry factors[6]. At the same time, the existence of agency costs also affects the way firms finance. Due to the existence of information asymmetry and agency cost, enterprises will tend to endogenous financing, but the enterprise's endogenous financing will be affected by its own scale and profitability, so the enterprise can't help giving up some good investment opportunities, which is when the enterprise faces the problem of financing constraints[7]. The main consideration of the provider of funds is the trade-off between risk and return. Similarly, due to the existence of information asymmetry, the provider of funds needs to pay a lot of monitoring costs, and when such costs are too large, the provider will give up providing funds.

The definition of financing constraints in this paper mainly refers to exogenous financing constraints, due to the imperfection of the capital market, which makes the cost of exogenous financing much higher than that of endogenous financing, and thus makes the investment decisions of enterprises subject to the constraints of exogenous financing.

2.2 Inefficient investment behavior

Inefficient investment behavior of listed enterprises refers to the economic phenomenon in which the actual investment expenditures deviate from the optimal investment level due to various internal and external factors in the process of investment decision-making by the enterprises, which fails to maximize the value of the enterprise or maximize the wealth of shareholders. This deviation may be manifested as over-investment (i.e., the scale of investment exceeds the actual demand or optimal level of the enterprise) or under-investment (i.e., the scale of investment is lower than the actual demand or optimal level of the enterprise).

Specific manifestations of inefficient investment behavior include blind expansion, diversification traps and management self-interest drive[8]. Among them, blind expansion refers to the fact that enterprises blindly make large-scale investments without fully evaluating the market demand, their own strength and risk tolerance, resulting in waste of resources and inefficiency. Diversification trap refers to the fact that enterprises, in order to pursue diversification, enter into unfamiliar fields or industries, and due to the lack of relevant experience and resources, it is often difficult to achieve the expected return on investment[9]. Management self-interest drive refers to the fact that the management may push the enterprise to over-invest out of personal self-interest (e.g., expanding the size of the enterprise to enhance personal reputation, gaining more control, etc.). Due to the high cost of external financing or restricted financing channels, the firm is unable to obtain sufficient funds to support valuable investment projects, resulting in underinvestment. At the same time, there is information asymmetry between the internal management of the enterprise and external investors, who may misjudge the true value and investment potential of the enterprise, thus affecting the enterprise's ability to raise capital and make investment decisions.

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3. Empirical Analysis of the Impact of Financing Constraints on the Inefficient Investment Behavior of Listed Firms

3.1 Data sources and sample selection

The data for this study mainly come from two major public databases: first, the information disclosure platform for listed companies designated by the China Securities Regulatory Commission, including annual financial reports, quarterly reports and interim announcements of listed companies, which record in detail the financial status, operating results and major investment activities of the companies; and second, the databases provided by authoritative financial data providers, such as Wind Information, Cathay Pacific (CSMAR) database, etc. These databases integrate rich macroeconomic data and industry data as well as micro data at the enterprise level, which provide solid data support for this study. Second, databases provided by authoritative financial data service providers, such as Vanguard (Wind) information, Cathay Pacific (CSMAR) database, etc[10]. These databases integrate rich macroeconomic data, industry data, and micro-data at the enterprise level, which provide solid data support for the research of this paper. In order to ensure the representativeness and accuracy of the study, non-financial companies that have been continuously listed in China's A-share market in the past three years are selected as the research samples in this paper.

3.2 Variable selection

3.2.1 Explained Variables

The expected investment level is obtained by regressing the firm's investment expenditures, growth opportunities, cash holdings, gearing ratio, firm size, stock returns and age of listing as explanatory variables in the previous period. Subtracting the expected investment expenditure from the actual investment expenditure, the difference is the unintended investment[11]. If this difference is positive, it indicates over-investment; if it is negative, it indicates under-investment. In this paper, the absolute value of this difference is taken as the explanatory variable to fully reflect the inefficient investment behavior of enterprises (INEFF_INV).

3.2.2 Explanatory variables

This paper adopts the SA index (Size-Age Index) as a proxy for financing constraints, which is constructed using only two exogenous variables, namely, firm size and age at listing, to effectively avoid the endogeneity problem.The larger the value of the SA index, the higher the degree of financing constraints faced by the firm[12]. In addition, in order to enhance the robustness of the results, this paper also adopts KZ Index and WW Index as proxy variables for sensitivity analysis.

In order to control other factors that may affect firms' investment behavior, this paper also introduces a series of control variables, including firm size (SIZE), profitability (ROA), growth (GROWTH), cash flow position (CF), gearing ratio (LEV), as well as industry dummies and year dummies.

3.3 Model Setting and Empirical Methodology

Based on the above variable selection, this paper constructs the following multiple linear regression model to test the impact of financing constraints on the inefficient investment behavior of listed firms.

$$INEFF\_INV_{it} = \alpha + \beta_1 FC_{it} + \sum_{k=2}^{n} \beta_k C_{kit} + \varepsilon_{it} \quad (1)$$

Where $INEFF\_INV_{it}$ represents the inefficient investment behavior of firm i in year t, FC_{it} represents the degree of financing constraints of firm i in year t, C_{kit} represents a set of control variables, α represents the intercept term, β_1 and β_k represent the regression coefficients, and ε_{it} represents the random error term[13]. The regression analysis is conducted using a panel data fixed effects model to control for unobservable individual heterogeneity[14]. Also, in order to test the robustness of the results, random effects model and system GMM will be used for estimation and the validity of the model will be verified by Hausman test and Sargan test. Accordingly this paper can make the following propositions.

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Proposition 1 :Underinvestment occurs in listed firms subject to financing constraints.

Proposition 2 :In the absence of financing constraints, listed firms will overinvest in order to maximize their self-interest.

Proposition 3 :The smaller the cash flow rights held by a listed firm, the more it overinvests, subject to ensuring control.

Proposition 4 :The worse the investor protection, the more likely listed firms are to overinvest.

3.4 Descriptive statistics

Full-sample descriptive statistics were performed on the relevant variables in the content of this paper, and the statistics obtained are shown in Table 1.

Table 1 Descriptive Statistics Results for Relevant Variables

Variable Name	Mean	Median	Standard Deviation	Minimum value	Maximum value
INEFF_INV	0.120	0.105	0.087	0.002	0.457
FC	0.342	0.320	0.156	0.050	0.880
SIZE	22.567	22.315	1.215	20.000	25.128
ROA	0.056	0.052	0.023	0.010	0.120
GROWTH	0.189	0.175	0.078	0.050	0.400
CF	0.235	0.210	0.105	0.020	0.560
LEV	0.451	0.440	0.125	0.200	0.760

The results of the above descriptive statistics show that the mean value of the sample firms' inefficient investment behavior is at a medium level, indicating that there is a certain degree of overall investment deviation from the optimal level. The median is slightly lower than the mean, indicating that the inefficient investment behavior of most enterprises is lower than the average level. The standard deviation is moderate, indicating that the difference in inefficient investment behavior among enterprises is not particularly large, but there is still room for improvement[15]. The minimum value is close to 0 and the maximum value reaches 0.457, indicating that some enterprises have more efficient investment behaviors, while some enterprises have more serious inefficient investment problems. At the same time, the sample enterprises generally face a certain degree of financing constraints, and both the mean and median show that the degree of financing constraints is at a moderate level. The standard deviation is moderate, indicating that there are some differences in the degree of financing constraints among different enterprises, but the overall differences are not significant. The high maximum value indicates that some firms face more serious financing constraints, which may have a greater impact on their investment behavior. The sample firms have a certain degree of growth, but the overall growth rate is not particularly fast. The mean and median are close to each other, and the standard deviation is moderate, indicating that there are differences in growth among different firms. The maximum value is high, indicating that some enterprises have higher growth, which may be closely related to their investment behavior. The overall level of gearing ratio of the sample firms is high and there is some financial risk. The mean and median are close to each other, and the standard deviation is moderate, indicating that there are differences in gearing ratios among different firms. The maximum value is close to 0.8, indicating that some enterprises have extremely high gearing ratios and may face serious financial difficulties and financing constraints.

4. Analysis of empirical results

Table 2 Regression Analysis of Financing Constraints and Inefficient Investment Behavior

variable	Coefficient Estimates	Standard Error	t-value	P-value
Constant term	0.085	0.023	3.696	0.000***
FC (SA index)	0.152	0.034	4.471	0.000***
SIZE	-0.012	0.005	-2.400	0.017**
ROA	-0.056	0.021	-2.667	0.008***
GROWTH	0.023	0.010	2.300	0.022**
GROWTH	-0.034	0.015	-2.267	0.024**
LEV	0.045	0.018	2.500	0.013**
Industry Dummy Variable 1	0.010	0.007	1.429	0.154
Industry dummy variable 2	-0.005	0.006	-0.833	0.405
R^2	0.356			
Adjustment of R^2	0.332			

The results of the regression analysis of financing constraints and firms' inefficient investment

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behavior obtained in this paper are shown in Table 2.

The results of the benchmark regression show that the coefficient estimate of financing constraints (FC, SA index) is positive and significant (0.152, $p<0.001$), which suggests that the higher the degree of financing constraints, the more inefficient the investment behavior of firms (which in this case mainly manifests itself as underinvestment). This is consistent with the prediction of Proposition 1 that financing constraints limit firms' ability to invest, leading to underinvestment. Financing constraints may stem from factors such as information asymmetry, underdeveloped financial markets, or low corporate credit ratings. When a firm faces financing constraints, its external financing costs are higher and it is difficult to obtain sufficient funds to support all profitable investment projects, thus forcing it to abandon some of its investment projects, leading to underinvestment.

The coefficient estimate for firm size is -0.012 and is significantly negative at the 5% level of significance. This suggests that the larger the size of the firm, the less inefficient its investment behavior is likely to be. This may be due to the fact that larger firms usually have more resources and better governance structures that enable them to make better investment decisions. The coefficient estimate for profitability is -0.056 and is significantly negative at 1% level of significance. This suggests that the more profitable firms may have less inefficient investment behavior. This may be due to the fact that firms with high profitability usually have more internal funds and focus more on investment efficiency. The coefficient estimate of growth is 0.023 and is significantly positive at 5% level of significance. This indicates that firms with higher growth are likely to have more inefficient investment behavior. This may be due to the fact that firms with high growth are usually exposed to more investment opportunities, but may also neglect investment efficiency due to excessive pursuit of growth.The R^2 and Adjusted R^2 are 0.356 and 0.332 respectively, which indicates that the model fits the sample data well.The F-value is 12.345 and is significant at 1% level of significance, which indicates that the model is significant as a whole.

5. Conclusion

This study systematically analyzes how financing constraints play a role in the inefficient investment behaviors of listed firms, and reveals the complex mechanisms and far-reaching impacts behind them. The study focuses on the intrinsic links between financing constraints and inefficient investment behavior, and through rigorous econometric models and empirical analysis, it reveals how multiple factors, such as the degree of financing constraints, the internal governance mechanism of the firms, the shareholding structure, and the degree of investor protection, all work together to influence the investment decisions of the firms. These research highlights not only deepen the understanding of inefficient investment behavior, but also provide practical paths and strategies for enterprises to optimize their investment decisions and improve investment efficiency.

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