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Investor Sentiment and Corporate Investment Behavior——Based on the Suppressing Effect of Managers Optimism

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Abstract: *With the rise of behavioral finance, many studies have gradually begun to focus on the influence of investors' and managers' irrational psychology in corporate finance, such as the influence of managers' overconfidence on corporate investment, and such as investors' herd mentality in the capital market, which lead them to make investment decisions that deviate from the theoretically optimal ones, thus leading to inefficient investment behavior. In this paper, 395 A-share listed companies are selected as the research objects and the research years are from 2015 to 2020, and investor sentiment, managerial optimism and corporate investment behavior are included in the same framework to explore the relationship between these three and what role managerial optimism has in the relationship between investor sentiment and corporate investment behavior, and the study finds that both investor sentiment and managerial optimism have a positive effect on corporate. The study finds that both investor sentiment and managerial optimism have positive effects on firms' investment behavior; investor sentiment and managerial optimism are negatively related; and managerial optimism plays the role of masking effect in the process of investor sentiment affecting firms' investment behavior.*

Keywords: *Investor sentiment; managerial optimism; corporate investment behavior; masking effect*

1. Introduction

In order to approach a more realistic capital market, this paper will explore the correlation between managerial irrationality (i.e. managerial optimism), investor irrationality (investor sentiment), and corporate investment behavior. How does investor sentiment affect the level of corporate investment? Does managerial optimism exist in the process as a mediating effect or a masking effect? The empirical research in this area is not sufficient and is the next question to be explored in this paper.

1.1 Investor sentiment and corporate investment

The market efficiency hypothesis recognizes that capital markets are efficient, that stock prices can truly reflect the intrinsic value of a firm, that stock price fluctuations can help a firm communicate important information to the outside world, and that stock prices are therefore considered to be a barometer of the firm, and that investors in the market are rational people seeking to maximize their profits, which is a very idealistic situation. However, the real capital market is not fully efficient, the internal information of enterprises is not fully transparent, and investors are not all rational people who cannot make wise decisions based on available information, and sometimes they tend to follow the herd blindly or be lured by false news, so the stock price often deviates from its true price and is affected by noise such as investor sentiment.

Polk and Sapienza find that mispricing of stocks can have a significant impact on the real economy, as firms tend to overinvest when stocks are overvalued (i.e., high investor sentiment) and, conversely, underinvest when stocks are undervalued (i.e., low investor sentiment). Baker, Stein and Wurgler confirm their prediction that firms' investment behavior is more sensitive to stock price fluctuations when firms relying on equity financing need to raise funds in the capital market to carry out investment projects, and Liu, Duan and Chen analyze the effect of investor sentiment on firms' investment behavior under different levels of managerial myopia. Liu and Chen analyzed the impact of investor sentiment on corporate investment under different levels of managerial myopia. When only the market capitalization-to-book ratio is considered as a market valuation method, the greater the degree of managerial myopia, the higher the sensitivity of the firm to market valuation and the higher the valuation of the firm, the higher the level of corporate investment, especially short-term investment.

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Investor sentiment can indirectly influence corporate investment by affecting the efficiency of corporate financing.

Even rational managers sometimes choose to trust investors when making decisions due to lack of sufficient information or blind herd mentality, and end up investing in negative NPV projects under the influence of overly optimistic investor sentiment.

1.2 Managerial overconfidence and corporate investment

Heaton proposes the hypothesis of managerial over-optimism. On the one hand, if managers are overconfident in the development prospects of their own firms and believe that the market undervalues them, thus they are reluctant to raise exogenous financing, then managers can only raise endogenous financing when they encounter good investment projects, and relying only on endogenous financing often leads to insufficient funds raised, forcing managers to give up good investment opportunities This can lead to underinvestment. On the other hand, the manager's overconfidence will affect his judgment of the value of the project, and when the manager encounters a negative NPV project, he tends to overestimate the return of the negative NPV project and underestimate its risks and costs, resulting in overinvestment by the firm. Therefore, even without considering information asymmetry and principal-agent costs, managers' optimism can cause inefficient investment by firms. From managers' optimism, when managers encounter good investment opportunities, it is beneficial for firms to keep sufficient free cash flow, which can avoid the problem of insufficient capital caused by managers' reluctance to make exogenous financing, and when managers always encounter relatively poor investment opportunities, it is better for firms not to keep more free cash flow, which can avoid managers' always overestimating the value of negative NPV projects This can avoid the over-investment problem caused by managers always overestimating the value of negative NPV items.

1.3 Research Contribution

In this paper, investor sentiment, managerial optimism and corporate investment behavior are discussed in the same framework, and the effects of managerial optimism and investor sentiment on corporate investment behavior are explored separately, while an attempt is made to explore the role played by managerial optimism in the process of investor sentiment affecting corporate investment behavior.

First, there is a rich literature on investor sentiment and managerial overconfidence, but there are not many papers that combine investor sentiment and managerial overconfidence to study them, and the time window of these papers is long, and the conclusions may change in the fast-developing China and the Chinese capital market; this paper takes 2015-2020 as the sample interval, and the conclusions are more time-sensitive and persuasive.

Second, the empirical results of this paper suggest that investor sentiment does not have a significant positive effect on managerial optimism, which is inconsistent with previous scholars' findings and questions the influence of investor sentiment on corporate investment behavior through the mediating channel of managerial optimism; psychological experiments show that overconfidence is corrected with more feedback information, and the empirical results may be able to show that after years of development, corporate managers have deepened their rational judgment and understanding of investor sentiment fluctuations and thus no longer become optimistic about high investor sentiment.

1.4 Theoretical analysis and hypothesis

In order to avoid risks such as dismissal and maintain the stability of share prices, managers may cater to investors' ideas and arrange projects favored by investors, thus, this paper proposes hypothesis H1.

H1: Investor sentiment positively affects the level of corporate investment.

In the capital market, investors and managers are not completely rational. According to the theory of emotional coordination and the theory of emotional infection, individuals' emotions and behaviors will influence and infect each other in the process of information exchange.

When the stock price plunges, investors' negative emotions will also infect managers and lead managers' pessimism. Thus, this paper proposes hypothesis H2a.

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H2a: Investor sentiment is positively related to managerial optimism.

The Chinese stock market is dominated by retail investors, who often lack sufficient information and the ability to identify good and bad companies. When high investor sentiment drives up stock prices, managers realize that investors are not really optimistic about the company's prospects and invest.

When investor sentiment is high, managers show their pessimism by showing their concern about falling stock prices in advance. Based on this, this paper proposes hypothesis H2b.

H2b: Investor sentiment and managerial optimism are negatively related.

Bridging hypothesis H2a, what investment decision will managers make after investor sentiment positively influences managerial sentiment?

Based on this, this paper proposes hypothesis H3a.

H3a: In the process of investor sentiment affecting corporate investment level, managerial optimism plays a part of the mediating effect.

In connection with the analysis of hypothesis H2b, managers have deepened their knowledge of the Chinese stock market and investors through years of learning and feedback, and the positive effect of investor sentiment on corporate investment behavior is greater when controlling for the managerial optimism variable. As a result, this paper proposes hypothesis H3b.

H3b: In the process of investor sentiment affecting the level of corporate investment, managerial optimism has a masking effect, i.e., an increase in investor sentiment will reduce the level of corporate investment by reducing managerial optimism.

2. Study Design

2.1 Data source and sample selection

In this paper, all listed companies in the Chinese A-share market are selected as the initial sample, and the study years are from 2015 to 2020. According to Wu, Shih-Nung and Wang, Qiang[1]. the momentum effect is significant within six months, and beyond six months there is a reversal, so in order to better measure investor sentiment, the investor sentiment measured in this paper is a semi-annual indicator, i.e., the data from January to June is one period, and the data from July -In order to maintain a consistent statistical calibration, the model is used to measure investor sentiment. In order to maintain a consistent statistical calibration, all other variables involved in the model are also semi-annual indicators. The data used in this paper are obtained from the CSMAR database.

After determining the initial study population and time horizon, the sample is processed in this paper as follows.

(1) Excluding the sample of listed companies in the financial sector.

(2) Excluding the sample of companies with missing data.

(3) For the sake of robustness, this paper winsorize the continuous variables at the 1% and 99% percentile to shrink the tails.

Finally, 4345 sets of balanced panel data are obtained, containing 395 listed companies from June 30, 2015 to December 31, 2020, with each half-year period, for a total of 11 periods.

2.2 Define Variables

Referring to the studies of Baker et al. the control variables selected in this paper include cash flow of the company at the beginning and end of the period (Cash0 , Cash1), growth rate of main business income (Grows), size of the company (Size), and gearing ratio (lev). In addition, year dummy variables (Year) and industry dummy variables (Industry) are included in this paper to control for year and industry effects[2].

All variables are defined in Table 1 .

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Table 1: Definition of variables

Variable Type	Variable Symbols	Variable Name	Variable Definition
Test Variables	INV	Enterprise investment level	Cash paid for construction of fixed assets, intangible assets and other long-term assets/total assets at beginning of period
	Optimism	Managerial optimism	If the actual profit level is lower than the forecasted profit level, the value is 1, and the opposite is 0.
	Sent_IN	Investor Sentiment	Semi-annual momentum indicator, cumulative monthly stock returns for six consecutive months
Control variables	Lev	Gearing ratio	Total liabilities at the beginning of the period / Total assets at the beginning of the period
	$Cash_0$	Cash flow of the company at the beginning of the period	Net cash flow from operating activities at the beginning of the period / Total assets at the beginning of the previous period
	Grows	Growth rate of main business revenue	Growth in revenue from main business / Opening amount of revenue from main business

2.3 Stability check

In this paper, the main variables were tested for the smoothness of the time series, generally using the same root unit root test (LLC test) and the different root unit root test (IPS test), if the original hypothesis of the existence of a unit root is rejected in both tests, this series is considered to be smooth, and vice versa. The results of the tests are shown in Table 2, where all the main variables reject the original hypothesis at the 1% level of significance, i.e., there is no unit root, and these variables are stationary without regular, seasonal fluctuations.

Table 2: Stability check

Variables	t-value	t-value
INV	-68.037***	-2.79***
Sent_IN	-56.102***	-2.395***
Optimism	-52.052***	-2.082***

Note: t-statistics in parentheses， *** p<0.01, ** p<0.05, * p<0.1

2.4 Research Model

The following three models are constructed, model (1) tests the effect of investor sentiment on firms' investment behavior, model (2) tests the effect of investor sentiment on managers' optimism, and model (3) tests the role of managers' optimism in the process of investor sentiment affecting firms' investment behavior.

$$INV = \beta_0 + \beta_1 Sent\_IN + \sum Control + \sum Industry + \sum Year + \varepsilon_1 \quad (1)$$

$$Optimism = \beta_0 + \beta_2 Sent\_IN + \sum Control + \sum Industry + \sum Year + \varepsilon_2 \quad (2)$$

$$INV = \beta_0 + \beta_3 Sent\_IN + \beta_4 Optimism + \sum Control + \sum Industry + \sum Year + \varepsilon_3 \quad (3)$$

Models (1) and (3) are linear regressions, and model (2) is a binary logistic regression, and the symbolic names of the variables in the model are shown in Table 1 .

The three models above are regressed and the coefficients of the key explanatory variables are analyzed, and the detailed implementation steps are explained in detail in the regression analysis section.

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3. Test results and analysis

3.1 Correlation Analysis

In this paper, correlation analysis was conducted on the key test variables, as seen in Table , investor sentiment and firm investment level are significantly positively correlated, indicating that high investor sentiment may positively affect firm investment level, but investor sentiment and managerial optimism are significantly negatively correlated, which is inconsistent with hypothesis H2a and seems to imply that hypothesis H2b is correct, correlation analysis only considers the correlation between the two variables and does not consider other influencing factors, therefore further regression analysis is needed to investigate the results after considering control variables[3].

Table 3: Correlation Analysis

	INVC	Sent_IN	Optimism
INVC	1	0.081***	-0.022
Sent_IN	0.040***	1	-0.056***
Optimism	0.018	-0.061***	1

3.2 Regressivity analysis

Table 4: Regression analysis

	model(1)	model(2)	model(3)
Variables	INV	Optimism	INV
Sent_IN	0.0086*	-0.7495***	0.0093**
	(1.84)	(-4.75)	(1.99)
Optimism			0.0078**
			(2.28)
Grows	0.0053**		0.0052**
	(2.34)		(2.30)
Cash1	0.0246		0.0277
	(1.04)		(1.17)
Cash0	0.0216		0.0258
	(0.92)		(1.10)
Lev	-0.0143**	0.8474***	-0.0149**
	(-2.09)	(4.01)	(-2.18)
Size	-0.0047***	0.0522	-0.0048***
	(-3.43)	(1.22)	(-3.50)
Ggcg		0.1501	
		(0.47)	
Ddsize		-0.0987	
		(-1.04)	
Gender		0.1326	
		(0.46)	
Age		-0.0119	
		(-1.02)	
Constant	0.1587***	-1.9575*	0.1591***
	(5.24)	(-1.88)	(5.26)
Observations	4,345	4,345	4,345
R-squared	0.029	-	0.030
Likelihood ratio		289.53***	
INDUSTRY	YES	YES	YES
YEAR	YES	YES	YES

In this paper, we sequentially regress models (1), (2) and (3), and the obtained empirical results are shown in Table .

The regression results support hypothesis H1, hypothesis H2b and hypothesis H3b. The regression results indicate that high investor sentiment and managerial optimism can significantly enhance corporate investment, which is consistent with the results of most previous studies, but investor sentiment does not significantly and positively affect managerial optimism, and in the process of investor sentiment affecting

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corporate investment behavior, managerial optimism plays the role of In the process of investor sentiment affecting firms' investment behavior, managerial optimism plays the role of masking the total effect, i.e., managerial optimism "masks" (attenuates) part of the positive effect of investor sentiment on firms' investment level, and when managerial optimism variable is controlled in the model, the effect of investor sentiment on firms' investment level increases[4].

3.3 Robustness analysis

To test the robustness of the above findings, this paper draws on the research design of Goyal & Yamada et al. and recalculates the investor sentiment indicator using a decomposition of Tobin'Q[5]. The re-measured investor sentiment is substituted into a recursive model for regression.

The regression equation is as follows.

$$\text{Tobinq} = \beta_0 + \beta_1 \text{ROE} + \beta_2 \text{Lev} + \beta_3 \text{Grows} + \beta_4 \text{Size} + \text{e} \quad (4)$$

Varying the investor sentiment measure yields conclusions that are not materially different from those in the previous paper, and therefore, the conclusions in the previous paper are more robust.

4. Conclusion

Investor sentiment and corporate investment level are significantly positively related, managerial optimism also significantly and positively affects corporate investment level, investor sentiment and managerial optimism are significantly and negatively related, managerial optimism shows a masking effect in the relationship between investor sentiment and corporate investment behavior, and the effect of investor sentiment on corporate investment level is significantly increased after controlling for managerial optimism variable in the model.

This paper also conducts heterogeneity analysis on the sample to test the effects of investor sentiment and managerial optimism on corporate investment at different levels of indebtedness.

The regression results are not fundamentally different from the total sample, and the effects of investor sentiment and managerial optimism on corporate investment behavior are more significant, which indicates that corporate investment levels are more likely to be influenced by investor sentiment and managerial optimism at lower debt levels, and also suggests that higher levels of debt can effectively inhibit over-investment behavior caused by managerial overconfidence.

Managerial optimism (overconfidence) illuminates the causes of inefficient corporate investment from a new perspective; therefore, taking effective measures to reduce managerial overconfidence can reduce inefficient corporate investment behavior.

First of all, excessive concentration of control of a company in a few managers tends to make managers overpowered, which tends to make them overestimate their personal ability and generate overconfidence. To reduce managers' inefficient investment due to overconfidence, the board of directors should play a more active supervisory role to restrain managers' behaviors; therefore, companies need to hire independent directors and play the role of independent directors instead of making them null and void; introduce external approval mechanisms while trying to strengthen internal authorization management.

Secondly, through the heterogeneity analysis, the research results show that the increase of debt level can effectively inhibit the investment level of the company; therefore, when managers always show overconfidence, the appropriate increase of debt level is not an effective solution.

Finally, the Dunning-Kruger effect shows that when people do not have enough information and knowledge, they tend to overestimate their ability and show overconfidence, and they will not realize that they are overconfident, and as the knowledge acquired increases, the level of confidence will decrease and the overconfidence will be corrected, therefore, in the process of making investment decisions, managers should increase the frequency of information feedback, obtain more information that will affect useful information that will influence investment decisions and correct psychological bias.

This paper conducted a regression analysis of investor sentiment and managerial optimism, and found that investor sentiment is not an influencing factor of managerial optimism, but the paper did not continue to explore the influencing factors of managerial optimism.

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