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# The Performance of Idiosyncratic Volatility in Different Mispricing

**Hongzhong Pan[1]**

[1]*Institute of Finance, Qilu University of Technology, Jinan 250000, China*

***Abstract:*** *The research on risk and return has always been a key research issue in the capital market. With the reform of China's capital market system, the test of the financial theory of the global market is an important step. When studying risks and returns, traditional finance theories draw the conclusion that the higher the risk, the higher the return. In fact, the company's idiosyncratic risk cannot be diversified by the portfolio, Stocks are susceptible to the company's idiosyncratic risks and are negatively related to idiosyncratic risks. We will verify the return performance of idiosyncratic volatility in stocks*

***Keywords:*** *idiosyncratic volatility,stock returns,trade on margin,margin trading*

## 1. Introduction

Since the CAPM model was proposed, many scholars at home and abroad have conducted empirical tests on traditional capital asset pricing models. Through the research on idiosyncratic volatility and stock expected return, it is found that the empirical results show that there is a significant correlation between the two, which is inconsistent with the classic CAPM model view[1].Interpreted from the perspective of supply and demand, using incomplete information models, there is a positive correlation between the expected return of stocks and the volatility of traits[2].When considering investor heterogeneity and short-selling restrictions, idiosyncratic fluctuations are negatively correlated with expected stock returns[3]. The idiosyncratic volatility obtained through the Fama-French three-factor model is positively correlated with the growth of expected stock returns[4].

Trade on margin can help the stock market stabilize the heat of price increases, help stock prices fall back to their own value, and help the stock market find prices[5]. The development of the margin trading mechanism is not only conducive to the improvement of stock pricing efficiency, but also conducive to the fluctuation of stock prices around value and reduce the volatility of the stock market[6]. Some stocks are more difficult to sell short than others. At the same time, for investors who use leverage, when the price of the underlying stock changes by one unit, the remaining short position is significantly smaller than the long position, and the risk of investor short positions is significantly greater than that The risks of Long Position[7].

## 2. Methodology

### *2.1 Theoretical basis*

The professionalism of investors in my chinese stock market is uneven, investors have gambling psychology. Investors have high risk appetite and low risk awareness, which leads to increased differentiation in price judgments in the stock market.The information disclosure of listed companies is not perfect, information asymmetry has exacerbated mispricing in the stock market. Due to the serious phenomenon of information asymmetry and blind obedience and the overreaction of ordinary investors to information in the stock market, the stock price will deviate from the intrinsic value of the period, There is a phenomenon that stocks are overvalued or undervalued. There are restrictions on margin trading in stock trading mechanism. Therefore, in different types of stocks, the expected return performance of idiosyncratic volatility will be different.

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## 3. Results and discussion

### *3.1 Variables and data*

The variables used in this study are defined as follows, the construction of the model follows Fama and French (1993, 1998). In the calculation of idiosyncratic volatility, in this article, we adopt the OLS regression method and use the Fama-French three-factor model to extract idiosyncratic volatility to construct a portfolio of idiosyncratic volatility. The model is as follows:

$$R_{i,t} - r_{f,t} = \propto_{i,t} + \beta_{MKT,t} r_{MKT,t} + \beta_{SMB,I} SMB_t + \beta_{HML,i} HML_t + \varepsilon_{i,t} \quad (1)$$

$$vol_i = \text{std}\ (\varepsilon_{i,t}) \quad (2)$$

$$vol_{i,k} = \sqrt{\text{N}}\text{std}\ (\varepsilon_{i,t}) \quad (3)$$

N represents the number of normal trading days for stocks in a month, and stocks with normal trading numbers greater than 80% of the total normal trading days are screened out as valid stock samples.

The article considers the availability of data and the difficulty of processing the choice of research frequency is monthly, the research interval is from January 2015 to December 2018. The daily income data, daily market value data, book-to-market value ratio data, risk-free interest rate data, and daily market return data of listed companies used in this article are all from CSMAR. The daily data of the three factors, the market excess return factor, the market value factor and the book-to-market value ratio factor, are all derived from RESSET.

### *3.2 Empirical analysis*

We divide stocks into two groups based on whether they can be traded on margin. Respectively test the relationship between return and trait volatility, we divide the trait volatility from small to large into five groups for testing . The result is shown in the table, Table 1 can be traded on margin.Table 2 indicates that margin trading is not allowed.

*Table 1 Can be traded on margin*

| vol | Rmrf | Smb | Hml | a |
|---|---|---|---|---|
| 1 | 0.8855 | 0.4801 | 0.0530 | 0.0029 |
| 2 | 0.9985 | 0.5156 | -0.0535 | 0.0007 |
| 3 | 1.0660 | 0.4844 | -0.0535 | -0.0001 |
| 4 | 1.1184 | 0.4728 | -0.3207 | -0.0007 |
| 5 | 1.1516 | 0.6297 | -0.4058 | -0.0008 |

We can find that as the volatility of the trait increases, the return of the stock portfolio is gradually increasing. The income gap between the highest group and the lowest group is 0.0037. We got a negative correlation result.

*Table 2 No margin trading*

| vol | Rmrf | Smb | Hml | a |
|---|---|---|---|---|
| 1 | 0.9141 | 0.6547 | -0.01 | 0.0032 |
| 2 | 1.0105 | 0.7348 | -0.024 | 0.0005 |
| 3 | 1.0662 | 0.7253 | -0.033 | -0.0002 |
| 4 | 1.1164 | 0.7518 | -0.048 | -0.0005 |
| 5 | 1.1179 | 0.9405 | -0.056 | -0.0008 |

We can find that as the volatility of the trait increases, the return of the stock portfolio is gradually increasing. The income gap between the highest group and the lowest group is 0.004. We can draw the same negative correlation conclusions from Table 1 and Table 2, but what is interesting is that among the groups that can be traded on margin, the gap between the group with the lowest trait volatility and

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the group with the highest trait volatility is even smaller.

## 4. Conclusion

As a hot research technology, moving target tracking technology has been widely used in various fields. With the help of low cost, low power consumption, self-organization and high error tolerance of wireless sensor networks, moving target tracking based on wireless sensor networks also has broad application prospects.

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