

Research on the Impact of Investor Sentiment on Chinese Stock Pricing

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Abstract: Asset pricing has always been one of the core topics in finance research. Traditional asset pricing theory builds a multi-factor pricing model based on market and company fundamentals and verifies it through empirical data. However, financial markets often exhibit irrational characteristics, and market efficiency theory and investor rationality assumptions cannot fully explain abnormal phenomena in the market. Therefore, behavioral finance has gradually emerged, expanding the framework of asset pricing models by introducing investor behavior and emotional factors. This study aims to explore the impact of investor sentiment on Chinese stock market pricing. By analyzing the monthly data of the Chinese stock market, the traditional Fama-French three-factor model was constructed, and on this basis, the sentiment factor was added to propose a new four-factor model. Research results show that the sentiment factor (SENT) has a significant impact on the returns of small-cap stocks and low price-to-book ratio stocks, especially during periods of large mood swings. Changes in investor sentiment often trigger irrational trading, leading to stock price declines. Reverse fluctuations. Compared with the three-factor model, the four-factor model has a better fitting effect in explaining stock market returns, further proving the importance of emotional factors in the Chinese stock market. This study not only fills the gap in the existing literature on investor sentiment in the Chinese stock market but also provides a theoretical basis for localized adjustment of multi-factor pricing models.

Keywords: Investor Sentimental, Overconfidence, Stock Price, Behavioral Finance

1. Introduction

In recent years, the Chinese stock market has experienced several significant market fluctuations and anomalies, many of which cannot be explained by traditional fundamental analysis. For example, in the 2015 stock market crash, the stock market experienced a plunge of more than 40% despite stable macroeconomic data and no significant changes in fundamentals. This phenomenon cannot be simply attributed to changes in market fundamentals[1]. Research has found that investor sentiment plays a significant role in stock market fluctuations. According to a certain study, the impact of mood swings on the Chinese stock market is even greater than that of other markets (such as the U.S. market), which shows that the Chinese market sentiment is more volatile, and investor behavior has a more significant impact on stock prices [2]. These phenomena indicate that traditional asset pricing models based on market rationality and efficiency cannot fully explain the investment returns in the Chinese stock market, especially during periods of greater emotional volatility [3].

Based on this background, this research aims to explore how investor sentiment affects the pricing behavior of the Chinese stock market and proposes the sentiment factor as an important supplement to the extended Fama-French three-factor model. Although existing studies have shown that emotional factors have an important impact on the market, most studies focus on mature markets, and there are relatively few relevant empirical studies on the Chinese market. More importantly, existing research mostly uses traditional sentiment measurement methods, such as investor confidence index or market sentiment index, but these methods often cannot fully capture the particularities of the Chinese market. Therefore, a core goal of this study is to fill the gap in the existing literature through a localized sentiment model and to verify the impact of sentiment factors on asset pricing in China's stock market through empirical analysis.

The research also investigates whether investor sentiment plays an important role in the Chinese stock market, especially during periods of severe mood swings, and whether emotional factors can significantly affect stock price returns. We combine the traditional Fama-French three-factor model with sentiment factors to construct a four-factor model and verify its applicability to the Chinese stock market through empirical analysis. This research not only provides a new perspective on understanding the role of investor sentiment in the Chinese stock market but also provides a theoretical basis for improving the localization of multi-factor asset pricing models, which has important academic value and practical significance.

2. Literature review

Behavioral finance is an interdisciplinary discipline that integrates psychology and finance to study the behavioral and emotional factors influencing financial decision-making.

2.1. Investor sentiment and stock pricing

Scholars have studied the relationship between investor sentiment and stock pricing, with most of them agreeing that investor sentiment significantly impacts stock returns. However, there is ongoing debate regarding the direction and magnitude of its impact.

Hengelbrock et al. suggest that investor sentiment can hurt the returns of the S&P index[4]. Research further indicates that the effect of investor sentiment on stock returns is usually positive in the short term but becomes negative in the long term. The phenomenon arises as heightened emotions are eventually corrected by market forces, leading to declining stock returns. In the short term, irrational investment behavior triggered by investor emotions may inflate stock prices, but over time, as rationality returns to the market, the market will gradually return to fundamental value, and stock prices will also decline.

Lee et al. pointed out that the current and future returns of the stock market will be influenced by investor sentiment [5]. Freyboote & Seagraves emphasize that investor sentiment should not be viewed solely as an individual factor; instead, it contributes to systemic risk, and therefore investor sentiment should be considered a systemic factor [6]. The optimistic sentiment generated by investor sentiment has the opposite effect on stock returns compared to pessimistic sentiment, with the former having a greater impact.

Brown et al. found that there are differences in the explanatory power of investor sentiment depending on stock characteristics [7]. Sentiment has a more pronounced impact on low-quality companies with poor financial performance, weak asset quality, and minimal dividends. There is a certain correlation between the sentiment of institutional investors and individual investors, and the change in individual investors' sentiment can be reasonably predicted by the change in institutional investors' sentiment. In addition, the higher the popularity of stocks, the more significant the impact on investor sentiment. Specifically, after adding sentiment factors, the explanatory power of the three-

factor model on stock returns is improved, and small, high PE, high PB, and high-priced stocks are more susceptible to changes in investor sentiment.

Han explored the impact of high-frequency emotional factors in the market, uncovering that there is an interaction between volatility, liquidity, and investor sentiment [8]. In the Chinese stock market, there is an unusually significant negative correlation between investor sentiment and short-term returns, suggesting that heightened sentiment often leads to adverse future performance.

2.2. Asset Pricing and Multi-Factor Models

The Chinese stock market was established relatively recently, with a shorter development history compared to more mature markets. Due to the long history of the three-factor model, much of the current academic research on asset pricing in China still relies on this framework, which has also demonstrated the applicability of the three-factor model in the Chinese market.

Sanusi & Ahmad argue that the value factor plays a more significant role in explaining stock returns than the beta coefficient[9]. Kan et al. analyzed and verified the effects of size and price-to-book (PB) ratios on Chinese stock market returns and proved the applicability of the Fama-French three-factor model in China [10]. Morgese Borys also highlighted the scale effect is very significant in the Chinese stock market, where small-cap companies tend to outperform large-cap companies [11]. Companies with higher book value also have higher returns. As research deepens, some scholars have questioned the explanatory power of the original three factors and hope to replace them with more effective factors. Elshqirat & Sharifzadeh attempted to replace the value factor in the three-factor model with the price-to-earnings ratio and found that it has good applicability in the Chinese stock market [12]. Because of the Fama French three-factor model, Da Fonseca et al. combined the special situation of companies in the Chinese stock market to eliminate the influence of shell value on these companies [13]. To analyze the data, the smallest 30% of stocks were excluded, and the value factor was replaced with the price-to-earnings ratio, constructing the Chinese version of the three-factor model CH-3. Ewald et al. tested the applicability of the five-factor model in the Chinese stock market at different periods, finding that it outperformed both the CAPM and the three-factor model in explaining excess returns [14]. Specifically, the five-factor model demonstrated varying effects during bull and bear markets: the value, investment, and profitability factors exhibited opposite influences on stock returns depending on market conditions, with the model proving especially effective during bear markets. While Laher believes that the five-factor model has better explanatory power than the three-factor model for the Chinese stock market [15], Kubota & Takehara challenged this view. They doubted the explanatory power of the five-factor model and put forward the view that the profit factor and investment factor cannot have a significant impact on stock returns [16]. Therefore, in the context of the Chinese stock market, asset pricing research faces unique challenges and opportunities. As a relatively new market, the Chinese stock market is still in the process of development. Therefore, although the multi-factor asset pricing theory has achieved certain success in mature markets, due to the particularity of the Chinese market (such as differences in market trading rules, market style, and information disclosure), these theories are often limited when directly applied to the Chinese stock market. Especially in the field of behavioral finance, the impact of emotional factors on asset pricing in the Chinese market is relatively weak, and there is often a lack of localized emotional models. Therefore, this study combines the actual situation of the Chinese market, proposes a more comprehensive investor sentiment indicator, and constructs an asset pricing model that adapts to the characteristics of the Chinese market, making the research results more reasonable.

2.3. Comparison between Models

According to a review of relevant literature, asset pricing has long been a central focus of academic research in finance. Early studies, such as those involving the Capital Asset Pricing Model (CAPM), primarily examined market risk while excluding external factors. However, as the financial market evolved, a single-factor pricing model cannot provide sufficient explanatory power. People are starting to focus on the fundamental characteristics of the company itself, attempting to use more explanatory factors for asset pricing, with Fama French's three-factor and five-factor models being typical examples. As multi-factor models developed, scholars recognized that observing market and company fundamentals alone was insufficient to explain the increasingly frequent market anomalies, and the efficient market hypothesis and investor rationality hypothesis are constantly being challenged. Therefore, scholars have begun to explore the impact of investor behavior on the market, highlighting the significance of behavioral finance. Behavioral finance examines the psychological and social factors influencing investor behavior, emphasizing that investment transactions are inherently human actions, shaped by psychological factors, and better explains many market phenomena.

3. Methods

3.1. Selection of data

This article plans to select monthly data of Chinese listed company stocks and, after processing, calculate the explanatory and dependent variables. The data is processed and excluded according to the following criterion: stock data with negative book value, company data within 6 months of IPO listing, monthly company data with missing data, and stock data with the smallest 30% market value are excluded from the dataset. The stock price performance of a company after going public often exhibits abnormal behavior.

3.2. Research design

This study utilizes the Fama French three-factor model. The explanatory variables in factor models need to be calculated and constructed. The construction of explanatory variables MKT, SMB, and HML is as follows:

$$R_{i,t} - R_{f,t} = \alpha_i + \beta_i * (R_{i,t} - R_{f,t}) + S_i * SMB_t + H_i * HML_t + \varepsilon_{i,t} \quad (1)$$

Firstly, there is the market factor MKT, which is $R_m, t - r_f$. The value of t market factor MKT is calculated by subtracting the market value-weighted average return of the portfolio from the monthly risk-free rate. Next are the market capitalization factor SMB and the value factor HML. This research uses Fama & French's 2x3 method to construct a combination of risk factors.

The basic form of the four-factor model with emotional factors added after Fama & French. Among them, the four factors are market factor, scale factor, value factor, and investor sentiment factor. Perform regression testing on the four-factor model to obtain the following regression coefficients, intercept terms, t-values, and adjusted goodness of fit for the four factors.

Building on the three-factor model, this study introduces an emotional factor (SENT) to capture the impact of investor sentiment on stock pricing. The regression equation for the four-factor model is:

$$R_{i,t} - R_{f,t} = \alpha_i + \beta_i * (R_{i,t} - R_{f,t}) + S_i * SMB_t + H_i * HML_t + V_i * SENT_t + \varepsilon_{i,t} \quad (2)$$

As analyzed earlier, the four-factor model with the addition of emotional factors has a better fitting effect and compared to large-scale portfolios and high book-to-market ratio portfolios, emotional

factors have a more significant impact on the returns of small-scale portfolios and low book-to-market ratio portfolios [17]. The emotional factor SENT was added to the model to construct a new four-factor model.

The GRS test (Gibbons, Ross, and Shanken) is employed to compare the explanatory power of the four-factor and three-factor models. The smaller the value of GRS, the better the performance of the model. In practical applications, GRS testing is relatively ideal and generally cannot pass. However, the advantages and disadvantages of the two models can be compared by observing the improvement of GRS values.

4. Results and Discussion

The financial community continues to explore more comprehensive methods for asset pricing, with related models constantly developing and improving. This research mainly explores the following aspects: First, regression tests were conducted using mid-month data, to validate the applicability of the Fama-French three-factor model in the Chinese stock market. The results confirmed that the Fama French three-factor model has a strong explanatory power for Chinese stock returns [15]. Secondly, considering the strong speculative atmosphere and significant impact of emotional fluctuations in the Chinese stock market, the investor sentiment factor is included in the Fama French three-factor model for empirical testing using four factors. Through the results of two regressions, it was found that the four-factor model improved the goodness of fit and could better enhance the explanatory power of the model.

This research shows that investor sentiment plays an important role in explaining stock returns, especially when the sentiment factor (SENT) is added to the traditional three-factor Fama-French model. However, this study still has some limitations, which can be further explored in future research. First, although this study used monthly data, higher frequency data (such as daily data) may provide a more detailed interaction between sentiment and stock returns. This will help to more accurately measure the immediate impact of investor sentiment, especially in periods of high market volatility. Second, this study relies on proxy variables to capture investor sentiment, and the accuracy of this method may be limited. Although sentiment indices based on news sentiment or social media data have been increasingly used in financial research, this method may still be biased, depending on how the data is aggregated and interpreted. Future research can adopt more advanced data collection and processing methods, such as real-time social media sentiment data, news report sentiment analysis, etc., to more comprehensively capture changes in investor sentiment. In addition, future research can also consider adding more external variables such as macroeconomic factors and geopolitical events to further explore how these factors work together with investor sentiment to affect asset pricing. As a relatively young discipline, behavioral finance may add more behavioral factors in the future to further improve asset pricing models and better explain complex market phenomena.

5. Conclusion

This Research is one of the first to empirically examine the impact of sentiment factors on the Chinese stock market. In the validating process for the three-factor model, the test results showed that its market, size, and value factors have statistically significant regression coefficients, indicating strong explanatory power for Chinese stock returns. The significance of market factors indicates the dominant force of market factors in the process of stock pricing. The scale factor has a more significant and positive impact on the stock returns of small cap listed companies. As the market value increases, the significance of the scale factor's impact decreases continuously. However, as market capitalization increases, the size factor's significance diminishes, and for the largest-cap companies, its impact on stock returns turns negative [17]. The impact of value factor on stock returns

is more significant in companies with large scale and book-to-value ratio deviation on both sides, while the impact is positive for companies with high book-to-value ratio, and vice versa.

Additionally, the emotional factor (SENT) introduced in the four-factor model demonstrated a significant impact on the returns of small market value portfolios, and the impact of emotions on stock returns was negative. This also indicates that changes in investor emotions often trigger irrational trading of stocks of small market value companies, but often face reverse fluctuations in returns, which is consistent with the reality and previous research conclusions.

Compared to mature capital markets, the Chinese stock market exhibits more pronounced emotional trading behaviors, stemming from the relatively lower maturity of its investor base. Excessive irrational behavior can easily cause abnormal market fluctuations. This research refers to existing relevant literature, uses principal component analysis to extract principal components, constructs the investor sentiment factor SENT, and adds it to the Fama French three factor model to construct a new four factor model.

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