Applied Economics and Finance; Vol. 12, No. 1; 2025
ISSN 2332-7294 E-ISSN 2332-7308
Published by Redfame Publishing

Investor Sentiment: How It Drives Stock Returns

Huanhao Su[1]

[1] School of Finance, Guangdong University of Finance & Economics, Guangdong, China

Correspondence: Huanhao Su, School of Finance, Guangdong University of Finance & Economics, Guangdong, China.

Received: October 30, 2024 Revised: December 20, 2024 Accepted: January 9, 2025

Available online: February 20, 2025 URL: https://doi.org/10.11114/aef.v12i1.7528

Abstract

As investors become more involved in financial markets, the "rational person" assumption of traditional finance theory is facing challenges. And the rise of behavioral finance has made investor sentiment the central topic of research. This article seeks to explore how investor sentiment influences stock returns and systematically examine this issue from three different perspectives: firstly, analyze the multidimensional factors that affect investor sentiment, including individual level, stock level, and environmental level; secondly, we will analyze investor sentiment's impacts on stock returns, including positive and negative effects, short-term and long-term effects, the impact of different market environments and stocks; finally, various methods for measuring investor sentiment are summarized, including directly or indirectly related index indicators, composite index indicators, and media or text data index indicators. Building on the summarized research conclusions, this article highlights directions for future research. The objective is to conduct an in-depth analysis of the long-term impact mechanisms of investor sentiment and to investigate effective methods for utilizing sentiment indicators to enhance the accuracy of market forecasting.

Keywords: investor sentiment, factors influencing, stock returns, measurement methods

1. Introduction

The expanding economy and rising national income levels have significantly increased investor participation in financial markets, especially stock trading. This challenges the assumption of "rational person" agents in traditional financial theory. The "rational person" hypothesis holds that investors will make decisions entirely based on reason, unaffected by emotions, and pursue maximum benefits. The Efficient Market Hypothesis (EMH) also supports this view, stating that in markets with sufficient information and active trading, investor sentiment does not significantly impact individual stock returns (Li, 2022). However, in recent years, numerous studies have shown that investor sentiment does indeed have an impact on the stock market (Meng et al., 2022). With the rise of behavioral finance, scholars have begun to realize that investors' decisions are not only based on rational analysis, but investor sentiment also plays a key role. Therefore, studying the impact of investor sentiment on stock returns has become a focus of academic attention.

The concept of investor sentiment originated internationally and remains a complex and subjective field. There is no consensus in academia regarding its definition, as researchers interpret it differently based on their perspectives and theoretical frameworks (Wang et al., 2020). Zweig (1973) was the first scholar to propose the concept of investor sentiment, which he believed was a bias in investors' estimation of the future value of a company. Delong & Summers (1990) first identified investor sentiment as an important subject of financial research in the noise trading model (DSSW) and systematically analyzed its impact on stock prices. The research contributes to the advancement of financial theory by elucidating the impact of investor sentiment on stock returns, thereby providing a novel perspective on investor behavior. As a result, investor sentiment has attracted considerable scholarly interest, resulting in the publication of a substantial number of related academic articles.

This article reviews recent relevant literature, aiming to provide theoretical basis and direction guidance for future research on the effective utilization of sentiment indicators in predicting market trends. It explores factors that affect investor sentiment, the impact of investor sentiment on stock returns, and methods for measuring investor sentiment. Finally, through systematic induction and analysis, this article provides prospects for potential research directions in the future.

2. Factors that Affect Investor Sentiment

The formation process of investor sentiment is relatively complex, therefore it is influenced by multiple factors. From existing literature, factors that can affect investor sentiment can be divided into three aspects: individual factors, market factors, and environmental factors.

2.1 Individual Factors

In the socio-economic environment, individuals exhibit multidimensional diversity, including age, personality traits, etc., which collectively affect their perception and response patterns to specific events. In the stock market, emotional reactions as individual factors have become a key factor influencing market behavior and decision-making (Yin, 2020). Therefore, in-depth exploration of the impact of individual factors on investor sentiment is of great significance for analyzing investor sentiment.

Regarding the impact of age on investor sentiment, research has shown that as age increases, investors exhibit more cautious and rational characteristics in decision-making (Eberhardt et al., 2019; Mueller et al., 2020), which may be related to the accumulation of experience and market understanding. Yin (2020) also found an inverted U-shaped relationship between age and emotional state. This suggests that both younger and older investors exhibit more stable emotional responses, whereas middle-aged investors may experience more pronounced emotional variability. Consequently, this reflects a non-linear relationship between age and investor sentiment, highlighting the disparities in emotional performance across different age demographics.

Additionally, personality traits significantly shape investors' emotional responses. Individuals with extroverted traits tend to display positive emotions in response to market increases, which is positively associated with their investment performance. Conversely, investors exhibiting high levels of neuroticism are more likely to experience negative emotions during market declines, which correlates negatively with their investment returns (Wang et al., 2014). Furthermore, Sachdeva & Lehal (2023) further explored the research results of Wang et al. (2014) and found that agreeableness and conscientiousness also have a significant impact on investment decisions. Investors with higher levels of conscientiousness tend to invest in the long term, while those with higher levels of neuroticism may exhibit more anxiety and insecurity in the short term.

Apart from age and personality traits, various individual characteristics also influence investor sentiment. Among them, educational background, income level, investment experience, household asset scale and proportion of stock investment have significant effects on investor sentiment (Yin, 2020). Notably, higher levels of education, income, extensive investment experience, and larger family asset sizes are frequently correlated with more favorable investment sentiment.

These investigations collectively underscore the intricate role of individual characteristics in the realm of investment decision-making. They highlight that personality traits affect investor emotions behaviors through a multitude of psychological mechanisms and moderating variables.

2.2 Stock Factors

Investor sentiment in financial markets is shaped by three primary elements: stock fundamentals, technical analysis, and news factors, each contributing uniquely to market behavior. Fluctuations in these factors profoundly influence investor sentiment by either amplifying irrational market behavior or encouraging rational investment decisions. Specifically, these dynamics may either exacerbate investors' responses, resulting in irrational volatility in stock prices, or they may facilitate more rational investment decisions (Han & Wu, 2007; Meng et al., 2022). Consequently, it is essential to comprehend and analyze the influence of these stock factors on investor sentiment.

2.2.1 Fundamental Factors of Stocks

Stock fundamentals represent an analytical approach utilized to assess the intrinsic value of stocks through the examination of macroeconomic indicators, industry trends, financial conditions, and various other determinants. In general, the level of macro-economic development and the quality of micro-financial statements can significantly affect investor sentiment, subsequently impacting stock market returns.

At the macro level, economic prosperity (Cui et al., 2016) and positive macroeconomic fluctuations (Xie & Tang, 2021) not only directly enhance investor confidence, but also have a positive effect on returns by increasing stock market liquidity. In addition, macroeconomic policies, especially monetary policies, have a direct impact on investor sentiment (Chen & Zheng, 2017): loose monetary policies encourage funds to shift from low yield savings to high-yield stock markets, boosting investor sentiment. On the contrary, tightening policies leads to a decline in emotions (Wang & Wang, 2020). Frequent policy changes can easily trigger investor pessimism, which in turn affects stock market returns, and uncertainty is transmitted through pessimistic channels (Hu & Luo, 2022). At the micro level, the quality of financial statements also affects investor sentiment and market reactions (Liu et al., 2018). High quality accounting information disclosure can effectively reduce the impact of sentiment on stock returns and minimize overreactions or erroneous decisions caused by information asymmetry.

2.2.2 Technical Factors of Stocks

The technical analysis of stocks constitutes a systematic methodology aimed at predicting stock price fluctuations through the examination of market trading data. This analysis encompasses various components, including price trends,

trading volumes, and an array of technical indicators. Collectively, these elements, in conjunction with other factors such as stock price and trading volume, significantly impact investor sentiment.

Fluctuations in stock prices significantly influence investor sentiment. High prices often elicit optimism, while low prices evoke pessimism (Han & Wu, 2007; Chan & Fong, 2010). An increase in stock prices typically elicits positive and optimistic emotions among investors, potentially establishing a positive feedback loop that further propels stock prices upward. Conversely, stagnant stock prices may evoke pessimistic sentiments among investors, which can hinder price appreciation or even precipitate a decline in stock values. Additionally, stock trading volume plays a crucial role in shaping investor sentiment (Huang et al., 2020). Research conducted by Yang (2016) indicates that the discount rate of closed-end funds and the volume of new account openings serve as effective measures of investor sentiment within the Chinese stock market, with trading volume demonstrating a significant correlation with these metrics. An increase in trading volume often attracts more investors, signaling positive market sentiment. Other factors in the technical aspect, including price-to-earnings ratios and stock return inertia indicators, significantly influence investor sentiment (Liang, 2010). Stocks characterized by high market capitalization, volatility, and price-to-book ratios are particularly susceptible to the effects of investor sentiment (Song & Li, 2012). From a technical standpoint, there is a clear relationship between stock prices and investor sentiment, where increased trading volume indicates positive sentiment and correlates with various other indicators.

2.2.3 News Factors of Stocks

From the perspective of stock news, in today's information age, media reports with efficient dissemination can swiftly communicate events to investors. Additionally, stock reviews offer investors multidimensional interpretations through comprehensive analysis and insights. Consequently, both media reports and stock reviews play a crucial role in shaping investor sentiment and are key factors that guide investment decisions.

Firstly, media coverage, with its unique breadth, has a significant impact on investor sentiment in terms of tone and content (Wang & Wu, 2015; Yin, 2016). The optimistic tendency reported by the media can significantly boost emotions and increase investors' confidence in trading. The negative media tone is negatively correlated with the Initial Public Offering (IPO) underpricing rate, first day turnover rate, and over fundraising ratio. This indicates that negative emotions may prompt investors to adopt more cautious investment strategies. Secondly, with the development of Internet technology, investors tend to make decisions through stock comments, which gradually become an important indicator of investor sentiment (Meng et al., 2022). Empirical studies indicate that stock reviews can both mirror and shape the emotional fluctuations of investors, thereby affecting their short-term decision-making processes. For instance, research conducted by Bu et al. (2018) utilizing data from the Oriental Wealth Network revealed that investors' emotional predispositions prior to market opening can significantly influence the initial assessment of stock value. Furthermore, once the trading session commences, the emotional shifts captured in real-time stock market commentary exert a more pronounced effect on the closing prices and daily trading volumes of the stocks in question.

2.3 Sampling Procedures

In terms of environmental factors, market and external environment affect investor sentiment through multiple mechanisms. Consequently, this sentiment affects stock returns and investment decisions.

In a bull market, the prevailing market conditions typically foster a more optimistic investor sentiment, which can result in an increase in both stock prices and trading volume. Empirical studies indicate that investor sentiment during bull markets serves as a more effective predictor of stock market performance compared to its role in bear markets (Zhang & Wang, 2014). Conversely, in bear markets, investor sentiment tends to be predominantly negative, potentially leading to a decline in stock prices and a reduction in trading volume. Research has demonstrated that investor sentiment exerts a more pronounced influence on stock returns in the Shanghai and Shenzhen stock markets during bear markets than in bull markets (Rao & Tu, 2016). This suggests that negative investor sentiment in bear markets may intensify the downward trajectory of stock prices.

In examining the external environment, Hirshleif and Shumway (2003) identified a positive correlation between sunshine and stock returns, suggesting that favorable weather conditions may enhance investor sentiment. Conversely, Goetzmann et al. (2015) observed that overcast weather can lead to an overvaluation of stocks among investors, subsequently increasing their propensity to sell. Additionally, Kamstra et al. (2003) demonstrated that seasonal variations also influence investor sentiment. Specifically, during the spring, investors tend to exhibit a typical level of risk aversion and engage in rational decision-making. In contrast, winter months are characterized by heightened emotional fluctuations and increased risk aversion, which can significantly impact investment choices.

3. The Main Impact of Investor Sentiment on Stock Returns

Currently, the evolution of behavioral finance has progressively challenged the traditional financial theory's assumption of the "rational person". Numerous scholars have empirically demonstrated that investor sentiment can influence stock

returns (Wen et al., 2014). Nonetheless, there exists a variety of perspectives within the academic community concerning the specific mechanisms through which these impacts are generated. These viewpoints can be broadly categorized into several distinct groups.

3.1 Positive or Negative Impact

The impact of investor sentiment on market returns is controversial, Some studies point out that it has a positive impact. Lee et al. (2002) analyzed with GARCH model and revealed that investor sentiment has a positive effect on market returns. The research of Wang & Sun (2004) further confirmed that the degree of optimism of investor sentiment is positively correlated with market returns. Zhu & Zhang (2008) also pointed out that when investor sentiment is high, the return rate of the stock price index rises significantly. Using GARCH-M model, Zhang & Yang (2009) also found that investor sentiment has a positive promoting effect on stock prices. The research of Zhang & Wang (2013) shows that emotional fluctuations caused by subjective belief adjustment have a positive impact on market return and volatility. Wang (2014) measured investor sentiment through the net inflow of open-end stock funds and found that there was a positive feedback mechanism between the two.

However, some studies suggest investor sentiment may negatively impact market returns. Schmeling (2009) studied the relationship between investor sentiment and stock returns in 18 industrialized countries. Taking consumer information index as sentiment indicator, Schmeling believed that investor sentiment had a negative impact on stock market returns. Zhao & Li (2019) also constructed a vector autoregressive VAR model and believed that rising sentiment index would lead to a decline in short-term stock returns. Zhang & Guo (2020) also reached a similar conclusion by using K-means cluster analysis. Yang et al. (2022) pointed out that there is a negative correlation between shareholder sentiment and the return rate of relevant indices through text sentiment analysis.

The findings of these studies underscore the intricate nature of the relationship between investor sentiment and market returns. Most empirical research has identified a positive correlation between investor sentiment and market returns, suggesting that heightened investor sentiment typically correlates with increased market returns. However, there is a subset of studies that have documented negative associations between these variables through various methodological approaches. Such adverse effects may arise from an overabundance of optimism in market sentiment or from heightened market volatility induced by irrational investor behavior.

3.2 Short-term or Long-Term Impact

In the research on the relationship between investor sentiment and stock market returns, many studies show that investor sentiment has a significant positive impact on short-term returns. Brown & Cliff (2004) research shows that stock returns are closely related to investor sentiment, and sentiment is positively correlated with returns in the short term. Rao & Wang (2010) further pointed out that media attention has a positive effect on short-term stock returns by influencing investor sentiment. The conclusions drawn by Yao et al. (2018) using a mixed-frequency data sampling model and Meng et al. (2022) using a weighted naive Bayes classification model both support this viewpoint. However, Duan et al. (2017) applied the SVM algorithm to research. They pointed out that investor sentiment is positively correlated with the return rate of individual stocks on the same day. However, the ability to predict the return rate in the next two days is limited. Xie & Tang (2021) proposed that positive investor sentiment may lead to short-term overheat in the stock market, which may turn negative after 1 to 2 months.

But the impact on long-term returns is controversial. Bu et al. (2018) also tested the prediction efficiency of investor sentiment on future market returns, trading volume and volatility. It is found that it only has a significant impact on the current rate of return, and has no predictive ability for the future. However, the research of Wang & Sun (2004) and Zhang & Liao (2009) shows that investor sentiment not only has a significant positive impact on stock market returns, but also can effectively predict future stock returns and volatility. Conversely, Wu & Han (2007) took the discount of closed-end funds as the sentiment indicator to further confirm that sentiment has a positive impact on market returns in the short term, but may have a reverse effect in the long run. The aggregate effect study by Jiang, & Wang (2010) shows that sentiment is positively correlated with short-term market returns, but negatively correlated with long-term market returns. Ni et al. (2015) also used the panel quantile model to find that investor sentiment has a significant impact on short-term high-yield stocks, while it has a significant negative impact on long-term low-yield stocks.

Although mainstream academic literature widely agrees that investor sentiment has a positive driving effect on market returns in the short term. This is reflected in the positive correlation between market sentiment indicators and short-term market returns. The argument about its long-term impact appears more complex and diversified. Some studies have revealed that investor sentiment may lead to negative effects such as increased market volatility in the long term, which in turn can have adverse effects on long-term returns. These studies suggest that irrational market sentiment may inflate valuations in the short term. However, over time, the market tends to revert to fundamentals, leading to price corrections and reduced long-term returns.

3.3 Impacts in Different Market Environments

Many scholars have found that there are significant differences in investors' reactions to changes in stock returns between bull and bear markets. He & Li (2007) and Gu & Jin (2013) pointed out that there are significant differences in the impact of investor sentiment on stock returns between bull and bear markets. In a bull market, the volatility generated by positive news is greater than that generated by negative news, while in a bear market, the opposite is true (An & Guo, 2009). This indicates that there are significant differences in the sensitivity of investors' reactions and the volatility of expected returns when facing different market information. Yin & Wu (2019) further argue that investor sentiment has a strong predictive ability for intraday stock returns during bull markets, while it exhibits a significant lag effect during bear markets. The reason is that during a bull market, stock market trading is active, investors' emotions are high and overconfident, their attention to information decreases, and they are prone to herd behavior, leading to a weakened interaction between emotions and returns. On the contrary, during bear markets, the stock market performs poorly, and investors are cautious. Discussions on stock price trends receive more attention on stock bar platforms, creating a strong emotional atmosphere that significantly affects stock price fluctuations (Fan et al., 2021). At this point, investors are more sensitive to changes in stock prices, and a decline in stock prices can easily trigger panic, thereby increasing the impact of emotions on changes in stock returns.

The impact of investor sentiment on stock returns shows significant differences between bull and bear markets, which deepens the understanding of the dynamic relationship between market sentiment and asset prices. Specifically, during a bull market, investor sentiment is optimistic and high, becoming an important driving force for stock price increases, forming a positive feedback mechanism between sentiment and returns. During a bear market, investor sentiment shifts towards pessimism and caution, exacerbating market selling and resulting in a decline in stock prices and negative growth in returns. Compared to a bull market, the negative impact of sentiment on returns is more significant in a bear market, as panic selling and lack of confidence amplify market volatility and downside risks. Therefore, when analyzing the performance of the stock market, we should fully consider the mechanism of investor sentiment in different market environments.

3.4 Impacts Under Different Types of Stocks

The impact of investor sentiment on different types of stocks varies, with small cap stocks being more susceptible to emotional fluctuations and large cap stocks being more stable. Brown & Cliff (2004) found through various classification studies that investor sentiment has a particularly prominent impact on small cap, newly issued, and high growth stocks. Baker & Wurgler (2006) empirically found that investor sentiment is significantly negatively correlated with small stock returns. Furthermore, Baker & Wurgler (2007) pointed out that there are differences in the sensitivity of stock types to investor sentiment. Small cap, young, highly volatile, or loss making companies are more susceptible to emotional drive, while large cap, profitable, and stable companies are more stable, and emotional fluctuations have limited impact on them. Fan et al. (2021) and Cheng & Zhang (2023) both found that small and medium-sized stocks are more susceptible to market sentiment because of their smaller market value. Meanwhile, large cap stocks have a slower response but show self-regulation ability under extreme market conditions. This is attributed to the stable market characteristics and high information transparency of large cap companies. In large cap companies, investors rely more on public information for decision-making. Emotional fluctuations have limited impact on them. On the contrary, small market value companies have low information transparency and high information dissemination costs. Investors of small market value companies are more concerned about stock price fluctuations, making their emotions easily influenced by prices. In addition, Yi et al. (2014) found that investors' preferences for asset classification affect investment decisions, while Zhao & Qu (2022) pointed out that the stock returns of basic industries such as transportation are significantly affected by emotions, but the impact is temporary.

Based on this, we can further explore the specific mechanism and performance of how investor sentiment affects stock returns. Most scholars have pointed out through empirical research that investor sentiment can directly affect investors' decisions, thereby having a differentiated impact on stocks with different characteristics. This impact is manifested as small cap stock being more sought after and their returns correspondingly increasing when emotions are high. When in a low mood, investors are more inclined to seek safety and choose large cap stocks as safe havens.

4. Methods for Measuring Investor Sentiment

In the context of accurately assessing investor sentiment, contemporary academic literature has identified several indicators for this purpose, which can be broadly categorized into four distinct groups.

4.1 Directly Related Index Indicators

Index indicators that are directly associated with investor sentiment are primarily derived from data collected through market research. These indicators encapsulate investors' anticipations and perceptions regarding the future trajectory of the market. There are many index indicators related to investor sentiment, such as Investor Intelligence index (Lee,

2002), American Association of Individual Investors Index (Brown & Cliff, 2004), CCTV watch Index (Wang & Sun, 2004), Investor confidence Index (Xue, 2005), Consumer confidence index (Michael & Evgenia, 2006), Good and bad index (Lu & Chen, 2013), and aggregate investor sentiment performance (Barber & Terrance, 2001) through questionnaires and surveys.

This measurement approach facilitates the direct acquisition of information from investors, thereby minimizing intermediary errors and enhancing accuracy and reliability (Xin & Guo, 2015). Nonetheless, it is important to acknowledge that substantial measurement discrepancies exist, which may not adequately capture the overall market sentiment (Meng et al., 2022; Cheng & Zhang, 2023). Consequently, an exclusive reliance on direct indicators for assessing investor sentiment may only provide insights into the emotional responses of a subset of investors under particular circumstances.

4.2 Indirectly Related Index Indicators

The indicators that are indirectly associated with investor sentiment primarily derive from stock market information, serving as proxies for investor sentiment. These indicators are characterized by well-defined measurement methodologies and objective data. Examples of indicators that are indirectly related to investor sentiment include closed-end fund discounts (Wu & Han, 2007), trading volume (Baker & Wurgler, 2006), turnover rate (Baker & Wurgler, 2007), volatility (Uygur & Ta, 2014), market liquidity levels (Baker & Stein, 2004), IPO issuance volume (Derrien, 2005), IPO first-day return rates (Aissia, 2014), and the number of new investor account openings (Liu & Liu, 2014), among others.

This measurement approach provides a direct insight into the decision-making processes of investors via technical indicators, while also serving as an indirect gauge of investor sentiment. However, its reliability is susceptible to fluctuations in the market (Xiang & Lu, 2018). Moreover, reliance on a singular indicator fails to adequately account for the effects of irrational market sentiment (Chi & Zhuang, 2011). Given the intricate and dynamic nature of irrational emotions within the market, a solitary indicator is insufficient to encompass all relevant influencing factors.

4.3 Composite Index Indicator

Currently, a majority of researchers have embraced a multifaceted measurement approach. This approach employs various indicators to assess investor sentiment in their investigations concerning the influence of investor sentiment on stock returns. The initial implementation of this methodology can be attributed to Baker & Wurgler (2006), who utilized principal component analysis (PCA) to amalgamate six significant indicators, including closed-end fund discounts, trading volume, IPO counts, and first-day returns, thereby creating the Investor Sentiment Composite Index (BW Index). Subsequently, numerous scholars have adopted Baker & Wurgler's framework, employing PCA to develop a comprehensive measure of investor sentiment. For instance, Yi & Mao (2009) identified six indicators, encompassing closed-end fund discounts, IPO-related metrics, and the consumer confidence index, to formulate the China Stock Market Investor Sentiment Composite Index (CICSI). Similarly, Xiang & Lu (2018) devised a high-frequency investor sentiment composite index relevant to both market and individual stock levels, utilizing five indicators, including turnover rate and relative strength index. Sun (2022) also selected six indicators, including the discount rate of closed-end fund discounts, to create an investor sentiment index, highlighting its positive correlation with stock returns. Furthermore, other methodologies have been employed by scholars to construct comprehensive indicators of investor sentiment; for example, Chi et al. (2012) applied Kalman filtering, Wang & Hao (2014) utilized partial least squares, and Wang et al. (2021) developed a functional investor sentiment index.

The development of a comprehensive index of investor sentiment encompasses multiple dimensions and offers a more nuanced representation of the influence of investor sentiment on stock returns. Nevertheless, the limited timeliness of these indicators (Cheng & Zhang, 2023), poses challenges in accurately capturing real-time fluctuations in market sentiment.

4.4 Media or Text Data Index Indicator

The swift advancement of the Internet and the emergence of the Web 2.0 era have led to an increasing number of investors utilizing online platforms for the exchange and acquisition of information. This trend reflects investor sentiment during that time. Based on this, scholars have begun to redirect their focus towards the examination of investor sentiment through the lens of online information. Antweiler & Frank (2004) chose Yahoo Finance and its online message board (referred to as Stock Bar), studied over 1.5 million text messages, and constructed an investor sentiment indicator. Sprenger et al. (2014) obtained post information from Twitter. Meng et al. (2016) acquired massive text information from nine well-known financial websites. Sun & Li (2020) retrieved information from Sina Weibo. Yin & Wang (2024) mined posting information from Oriental Wealth Network. They separately constructed indicators of investor sentiment, and both concluded that text messages can influence investor sentiment. Yao et al. (2021) constructed a financial sentiment dictionary and constructed investor sentiment indicators based on annual reports of

listed companies and social media texts. The study found that these sentiment indicators have an impact on stock returns.

These methods can quantitatively analyze the impact of investor sentiment on stock returns through data analysis (Wang et al., 2015). The large amount of data obtained is also comprehensive and can reflect real-time changes in market investor sentiment. However, textual data contains a large amount of useless and irrelevant information (Feng, 2024). How to extract valuable information from massive data and apply it to the construction of investor indices has become a research challenge.

5. Conclusion

This article provides a synthesis of prior scholarly research and examines the influence of investor sentiment on stock returns. The investigation encompasses three primary dimensions: firstly, the diverse factors that influence investor sentiment; secondly, the relationship between investor sentiment and stock returns; and thirdly, the specific methodologies employed to quantify investor sentiment. Draw the following conclusion: (a) Investor sentiment is shaped by a variety of determinants. Individual characteristics such as age, personality traits, educational background, income level, and the size of household assets play a crucial role in influencing investors' emotional reactions, risk tolerance, and decision-making processes. Additionally, stock-specific factors, which encompass the fundamentals, technical analysis and news, can elicit changes in investor sentiment. Meanwhile, the broader market environment and external influences also significantly affect investor sentiment. (b) The influence of investor sentiment on stock returns is a multifaceted topic within academic literature. The prevailing perspective suggests that, in the short term, elevated levels of investor sentiment tend to positively correlate with market returns. However, empirical research indicates that extreme emotional states, whether excessively optimistic or pessimistic, can lead to a decline in market returns, thereby exhibiting a negative effect. Moreover, the impact of investor sentiment on stock returns varies between short-term and long-term horizons; while emotions may play a dominant role in the short term, long-term returns are more significantly shaped by intrinsic stock characteristics. Additionally, this influence is characterized by heterogeneity across different market conditions, such as bull and bear markets, as well as among various types of stocks. (c) Presently, a range of methodologies exists for assessing investor sentiment, encompassing direct correlation index indicators, indirect correlation index indicators, composite index indicators, and real-time sentiment analysis utilizing textual or media data. Each of these approaches possesses distinct advantages and limitations, rendering them suitable for specific contexts. Consequently, it is prudent to conduct a thorough evaluation of various factors in order to select the most appropriate method for accurately quantifying investor sentiment in the prevailing circumstances.

Finally, through a systematic induction and analysis of the extant academic literature, this study delineates a novel avenue for future research: to explore the long-term impact mechanisms of investor sentiment in depth and to develop effective strategies to utilize sentiment indicators to enhance the accuracy of market predictions. This initiative aspires to aid investors in making more informed and rational investment decisions within the context of a rapidly evolving market landscape. It ultimately aims to optimize investment efficiency and performance returns.

Acknowledgments

Not applicable.

Authors' contributions

Not applicable.

Funding

Not applicable.

Competing interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Informed consent

Obtained.

Ethics approval

The Publication Ethics Committee of the Redfame Publishing.

The journal's policies adhere to the Core Practices established by the Committee on Publication Ethics (COPE).

Provenance and peer review

Not commissioned; externally double-blind peer reviewed.

Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Data sharing statement

No additional data are available.

References

Aissia, D. B. (2014). IPO first-day returns: Skewness preference, investor sentiment and uncertainty underlying factors. *Review of Financial Economics*, *23*(3), 148-154. https://doi.org/10.1016/j.rfe.2014.06.001

An, Q. G., & Guo, X. B. (2009). Research on the volatility of stock market return rate based on GARCH family models. *Journal of Shandong University of Finance*, *1*, 47-50. https://doi.org/10.3969/j.issn.1008-2670.2009.01.011

Antweiler, W., & Frank, M. Z. (2004). Is all that talk just noise? The information content of internet stock message boards. *Journal of Finance*, *59*(3), 1259-1294. https://doi.org/10.1111/j.1540-6261.2004.00662.x

Baker, M., & Stein, J. C. (2004). Market liquidity as a sentiment indicator. *Journal of Financial Markets*, *7*(3), 271-299. https://doi.org/10.1016/j.finmar.2003.11.005

Baker, M., & Wurgler, J. (2006). Investor sentiment and the cross-section of stock returns. *Economic Management Journal*, *61*(4), 1645-1680. https://doi.org/10.1111/j.1540-6261.2006.00885.x

Baker, M., & Wurgler, J. (2007). Investor sentiment in the stock market. *Journal of Economic Perspectives*, *21*(2), 129-152. https://doi.org/10.2139/ssrn.962706

Barber, B. M., & Terrance, O. (2001). Boys will be boys: Gender, overconfidence, and common stock investment. *Quarterly Journal of Economics*, *116*(1), 261-292. https://doi.org/10.2139/ssrn.139415

Brown, G. W., & Cliff, M. T. (2004). Investor sentiment and the near-term stock market. *Journal of Empirical Finance*, *11*(1), 1-27. https://doi.org/10.1016/j.jempfin.2002.12.001

Bu, H., Xie, Z., Li, J. H., & Wu, J. J. (2018). Investor sentiment extracted from internet stock message boards and its effect on Chinese stock market. *Journal of Management Sciences in China*, *21*(4), 86-101. https://doi.org/10.3969/j.issn.1007-9807.2018.04.005

Chan, S. Y., & Fong, W. M. (2004). Individual investors' sentiment and temporary stock price pressure. *Journal of Business Finance & Accounting*, *31*(5-6), 823-836. https://doi.org/10.1111/j.0306-686X.2004.00558.x

Chen, Y., & Zheng, Z. (2017). The impact of China's monetary policy on investor sentiment. *Shanghai Finance*, *2*, 17-24. https://doi.org/10.13910/j.cnki.shjr.2017.02.003

Cheng, J. H., & Zhang, Y. H. (2023). The long-term impact and short-term interaction of investor sentiment on stock returns. *Journal of Xuzhou Institute of Technology (Social Sciences Edition)*, *38*(4), 95-108. https://doi.org/10.20068/j.cnki.jxitsh.2023.0051

Chi, L. X., & Zhuang, X. T. (2011). Investors' behavior biases and stop-loss strategy: Empirical study based on disposition effect and reference point. *Journal of Management Sciences in China*, *14*(10), 54-66.

Chi, L. X., Zhang, G. S., Zhuang, X. T., & Song, D. L. (2012). A study on investor sentiment index and Chinese stock market based on the extended Kalman filter method. *Journal of Industrial Engineering and Engineering Management*, *26*(3), 122-128+165. https://doi.org/10.13587/j.cnki.jieem.2012.03.019

Cui, F. H., Chen, X. S., & Fang, H. X. (2016). The impact of economic cycle and investor sentiment upon corporate financing. *Securities Market Herald*, *2*, 38-46.

Delong, J. B., & Summers, L. H. (1990). Equipment investment and economic growth. *The Quarterly Journal of Economics*, *106*(2), 445-502. https://doi.org/10.2307/2937944

Derrien, F. (2005). IPO pricing in "hot" market conditions: Who leaves money on the table? *Journal of Finance*, *60*(1), 487-521. https://doi.org/10.1111/j.1540-6261.2005.00736.x

Duan, J. J., Liu, H. Z., & Zeng, J. P. (2017). Analysis on information content of China's internet stock message boards. *Journal of Financial Research*, *10*, 178-192.

Eberhardt, W., Bruin, D. B. W., & Strough, J. (2019). Age differences in financial decision making: The benefits of more experience and less negative emotions. *Journal of Behavioral Decision Making*, *32*(1), 79-93. https://doi.org/10.1002/bdm.2097

Fan, P. Y., Yang, Y., Zhang, Z. P., & Chen, M. (2021). The relationship between individual stock investor sentiment and the stock yield—Based on the perspective of stock evaluation information. *Mathematics in Practice and Theory*, *52*(16), 305-320.

Feng, J. (2024). Research on GEM stock return forecasting based on investor sentiment. *Science Technology and Industry*, *24*(4), 48-55.

Goetzmann, W. N., Dasol, K., Alok, K., & Qin, W. (2015). Weather-induced Mood, institutional investors and stock returns. *Review of Financial Studies, 1,* 73-111. https://www.jstor.org/stable/24466848

Gu, F. J., & Jin, D. H. (2013). Investors' over-responses and asymmetric volatility phenomenon in bull and bear markets. *Journal of Applied Statistics and Management*, *32*(3), 533-544. https://doi.org/10.13860/j.cnki.sltj.2013.03.018

Han, L. Y., & Wu, Y. R. (2007). Investor sentiment and IPOs mystery—Underpricing or premium. *Management World*, *3*, 51-61. https://doi.org/10.19744/j.cnki.11-1235/f.2007.03.007

He, X. Q., & Li, T. (2007). The asymmetric response of the stock market under different market situation: An empirical analysis based on China's Shanghai stock market. *Journal of Financial Research*, *8*, 131-140.

Hirshleifer, D., & Shumway, T. (2003). Good day sunshine: Stock returns and the weather. *Journal of Finance*, *58*(3), 1009-1032. https://doi.org/10.2139/ssrn.265674

Hu, W. W., & Luo, T. Y. (2022). The impact of economic policy uncertainty on stock market returns: An intermediate effect test based on investor sentiment. *Wuhan Finance*, *5*, 25-33.

Huang, C. X., Wen, S. G., Yang, X., Wen, F. H., & Yang, X. G. (2020). The interactive relationship between individual investor sentiment and stock price behaviors. *Chinese Journal of Management Science*, *28*(3), 191-200. https://doi.org/10.16381/j.cnki.issn1003-207x.2020.03.020

Jiang, Y. M., & Wang, M. Z. (2010). Investor sentiment and stock returns: An empirical study on aggregate effects and cross-section effects. *Nankai Business Review*, *13*(3), 150-160.

Kamstra, M. J., Kramer, L. A., & Levi, M. D. (2003). Winter blues: A sad stock market cycle. *The American economic review*, *93*(1), 324-343. https://doi.org/10.1257/000282803321455322

Lee, Y. W., Jiang, X. C., & Indro, C. D. (2002). Stock market volatility, excess returns, and the role of investor sentiment. *Journal of Banking and Finance*, *26*(12), 2277-2299. https://doi.org/10.1016/S0378-4266(01)00202-3

Li, W. X. (2022). Empirical research on the impact of investor sentiment on stock market returns. *Time-honored Brand Marketing*, *24*, 55-57.

Liang, L. Z. (2010). Empirical research on factors affecting investor sentiment. *Statistics and Decision*, *4*, 138-141. https://doi.org/10.13546/j.cnki.tjyjc.2010.04.056

Liu, B., Hu, J. X., & Li, T. (2018). Investor sentiment, accounting information quality and stock returns. *Management Review*, *30*(7), 34-44. https://doi.org/10.14120/j.cnki.cn11-5057/f.2018.07.004

Liu, W. Q., & Liu, X. X. (2014). Individual/institutional investor sentiment and stock returns: Study based on Shanghai A-share market. *Journal of Management Sciences in China*, *3*, 70-87.

Lu, J. C., & Chen, J. (2013). Asymmetric research on the impact of extreme investor sentiment on stock price indexes. *Systems Engineering*, *2*, 13-22.

Meng, X. J., Yang, Y. F., & Zhao, X. Q. (2016). The research on financial news and stock market investment strategy research—Based on text mining of financial websites. *Investment Research*, *35*(8), 29-37.

Meng, X., Li, Y. R., & Hu, F. (2022). A research on the influence of investor sentiment on A-share returns based on stock comments. *Mathematics in Practice and Theory*, *52*(8), 78-96.

Michael, L., & Evgenia, P. (2006). Consumer confidence and asset prices: Some empirical evidence. *Review of Financial Studies*, *19*(4), 1499-1529. https://doi.org/10.2139/ssrn.335240

Mueller, E. A., Wood, S. A., Hanoch, Y., Huang, Y., & Reed, C. L. (2020). Older and wiser: Age differences in susceptibility to investment fraud: The protective role of emotional intelligence. *Journal of Elder Abuse & Neglect*, *32*(2), 1-21. https://doi.org/10.1080/08946566.2020.1736704

Ni, Z. X., Wang, D. Z., & Xue, W. J. (2015). Investor sentiment and its nonlinear effect on stock returns—New evidence from the Chinese stock market based on panel quantile regression model. *Economic Modelling*, *50*, 266-274. https://doi.org/10.1016/j.econmod.2015.07.007

Rao, L. L., & Tu, Y. R. (2016). Asymmetric analysis of the impact of investor sentiment on stock returns in bull and bear markets. *Commercial Economy*, *8*, 141-143.

Rao, Y. L., & Wang, P. (2010). The impact of media attention on the performance of new shares—Evidence from China's stock market. *Finance and Accounting Monthly*, *3*, 1-7. https://doi.org/10.3969/j.issn.1674-3059.2010.03.001

Sachdeva, M., & Lehal, R. (2023). The influence of personality traits on investment decision-making: A moderated mediation approach. *International Journal of Bank Marketing*, *41*(3), 810-834. https://doi.org/10.1108/ijbm-07-2022-0313

Schmeling, M. (2009). Investor sentiment and stock returns: Some international evidence. *Journal of Empirical Finance*, *16*(3). https://doi.org/10.1016/j.jempfin.2009.01.002

Song, Z. F., & Li, Y. (2012). Relationship between investor sentiment and stock characteristic. *Systems Engineering-Theory & Practice*, *32*(1), 27-33. https://doi.org/10.3969/j.issn.1000-6788.2012.01.004

Sprenger, T. O., Tumasjan, A., Sandner, P. G., & Welpe, I. M. (2014). Tweets and trades: The information content of stock microblogs. *European Financial Management*, *20*(5), 926-957. https://doi.org/10.1111/j.1468-036X.2013.12007.x

Sun, M. X., & Li, L. L. (2020). Research on the influence of investor sentiment on stock market volatility based on data mining. *Journal of Yanshan University (Philosophy and Social Sciences Edition)*, *21*(1), 68-77. https://doi.org/10.15883/j.13-1277/c.20200106810

Sun, P. Y. (2022). The impact of investor sentiment on stock returns. *Modern Business*, *5*, 80-82. https://doi.org/10.14097/j.cnki.5392/2022.05.037

Uygur, U., & Ta, O. (2014). The impacts of investor sentiment on returns and conditional volatility of international stock markets. *Quality & Quantity*, *48*(3), 1165-1179. https://doi.org/10.1007/s11135-013-9827-3

Wang, B. Q., Huang, J. Y., & Sun, W. F. (2020). Analysis of research on the influencing factors of investor sentiment. *Northern Economy and Trade*, *2*, 17-22.

Wang, C. (2014). The effect of investor sentiment on return and volatility of stock market—Based on empirical study of net flow of open-end equity funds. *Chinese Journal of Management Science*, *22*(9), 49-56. https://doi.org/10.16381/j.cnki.issn1003-207x.2014.09.011

Wang, C. Y., & Wu, J. W. (2015). Media tone, investor sentiment and IPO pricing. *Journal of Financial Research*, *9*, 174-189.

Wang, D. Q., Tian, S. H., Zhu, J. P., & Xu, Y. (2021). Research on the construction of functional index for measuring investor sentiment in Chinese stock markets. *Journal of Applied Statistics and Management*, *1*, 162-174. https://doi.org/10.13860/j.cnki.sltj.20201219-017

Wang, H. C., Zhang, et al. (2014). Emotion and investment returns: Situation and personality as moderators in a stock market. *Social Behavior and Personality*, *42*(4), 561-569. https://doi.org/10.2224/sbp.2014.42.4.561

Wang, H. W., Zhang, D., Zheng, L. J., & Lu, T. (2015). The effect of online comments on stock trends by sentiment analysis. *Journal of the China Society for Scientific and Technical Information*, *34*(11), 1190-1202.

Wang, M. J., & Sun, J. J. (2004). Stock market returns, volatility and the role of investor sentiment in China. *Economic Research Journal*, *10*, 75-83.

Wang, Y. T., & Wang, S. W. (2020). Analysis of the impact of policy uncertainty on investor sentiment. *Market Weekly*, *2*, 115-116.

Wang, Z., & Hao, G. (2014). Research on the construction of investor sentiment index based on partial least square method. *Financial Theory and Practice*, *7*, 1-6.

Wen, F. H., Xiao, J. L., Huang, C. X., Chen, X. H., & Yang, X. G. (2014). The effect of characteristics of investor sentiment on stock price behaviors. *Journal of Management Sciences in China*, *17*(3), 60-69.

Wu, Y. R., & Han, L. Y. (2007). Imperfect rationality, sentiment and closed end fund puzzle. *Economic Research Journal*, *42*(3), 117-129.

Xiang, C., & Lu, J. (2018). Validation of investor sentiment index based on technical analysis indicators. *Journal of*

Management Sciences, *31*(1), 129-148.

Xie, S. Q., & Tang, S. X. (2021). The impact of investor sentiment and macro economy fluctuations on stock market returns. *Macroeconomics*, *2*, 99-107. https://doi.org/10.16304/j.cnki.11-3952/f.2021.02.010

Xin, Z. P., & Guo, W. S. (2015). Review of research on investor sentiment measurement methods. *Journal of Shenyang Normal University (Social Science Edition)*, *39*(2), 62-64. https://doi.org/10.19496/j.cnki.ssxb.2015.02.020

Xue, F. (2005). The theory of overconfidence and its influence on financial markets. *Contemporary Economic Management*, *3*, 30-33. https://doi.org/10.3969/j.issn.1673-0461.2005.03.005

Yang, S. H., Yu, R. F., & Fan, W. B. (2022). Impact of investment sentiment on stock market yield based on Internet public voice. *Finance Theory and Teaching*, *2*, 49-55. https://doi.org/10.13298/j.cnki.ftat.2022.02.018

Yang, X. (2016). Empirical analysis of the relationship between investor sentiment and market trading volume. *Statistics and Decision*, *24*, 163-166. https://doi.org/10.13546/j.cnki.tjyjc.2016.24.043

Yao, J. Q., Feng, X., Wang, Z. J., Ji, R. R., & Zhang, W. (2021). Tone, sentiment and market impacts: The construction of Chinese sentiment dictionary in finance. *Journal of Management Sciences in China*, *24*(5), 26-46. https://doi.org/10.19920/j.cnki.jmsc.2021.05.002

Yao, Y. Z., Wang, J. Q., & Liu, Z. F. (2018). Mixed-frequency investor sentiment and stock price behavior. *Journal of Management Sciences in China*, *21*(2), 104-113. https://doi.org/10.3969/j.issn.1007-9807.2018.02.008

Yi, Z. G., & Mao, N. (2009). Research on investor sentiment measurement in China's stock market: Construction of CICSI. *Journal of Financial Research*, *11*, 174-184.

Yi, Z. G., Gong, H. F., Mao, N., & Pan, X. Y. (2014). Category thought, investor sentiment and stock price co-movement. *Management Review*, *4*, 22-30. https://doi.org/10.14120/j.cnki.cn11-5057/f.2014.04.002

Yin, H. Y. (2016). A study on effect of media reports on investor sentiment: Evidence from China's stock market. *Journal of Xiamen University (Philosophy and Social Sciences Edition)*, *2*, 92-101.

Yin, H. Y. (2020). Individual characteristics, social networks and investor sentiment. *Journal of Shanghai University of Finance and Economics (Philosophy and Social Sciences Edition)*, *22*(5), 109-123+137. https://doi.org/10.16538/j.cnki.jsufe.2020.05.008

Yin, H. Y., & Wang, X. X. (2024). Does investor sentiment affect the efficiency of stock pricing? —Textual evidence from the stock community *Journal of Beijing Union University (Humanities and Social Sciences Edition)*, *22*(3), 96-111. https://doi.org/10.16255/j.cnki.11-5117c.2024.0031

Yin, H. Y., & Wu, X. Y. (2019). Predictive effect of high-frequency investor sentiment on the intraday stocks return. *China Industrial Economics*, *8*, 80-98. https://doi.org/10.19581/j.cnki.ciejournal.2019.08.005

Zhang, A. L., & Guo, S. G. (2020). Asymmetric effect of investor emotions on heterogeneous stock markets. *Statistics and Information Forum*, *35*(4), 113-118.

Zhang, D., & Liao, S. G. (2009). Research on investor sentiment in Chinese securities market. *Securities Market Herald*, *10*, 61-68.

Zhang, H. Y., & Wang, H. L. (2014). A study on the interaction between investor sentiment and stock price returns: Based on the comparison of bull and bear markets. *China Business & Trade*, *5*, 80-82+84.

Zhang, Q., & Yang, S. E. (2009). Noise trading, investor sentiment volatility and stock returns. *Systems Engineering-Theory & Practice*, *29*(3), 40-47. https://doi.org/10.3321/j.issn:1000-6788.2009.03.007

Zhang, Z. X., & Wang, H. L. (2013). Investor sentiment, subjective belief adjustment and market fluctuations. *Journal of Financial Research*, *4*, 142-155.

Zhao, Q. G., & Qu, X. Y. (2022). The impact of investor sentiment on stock returns of different industries in China. *Friends of Accounting*, *14*, 54-60. https://doi.org/10.3969/j.issn.1004-5937.2022.14.008

Zhao, S. Y., & Li, J. (2019). The impact of investor sentiment on stock returns. *Economist*, *3*, 74-75+78.

Zhu, W. H., & Zhang, Z. X. (2008). Investor sentiment, market volatility and stock market bubble. *Economic Theory and Business Management*, *2*, 45-50. https://doi.org/10.3969/j.issn.1000-596X.2008.02.008

Zweig, M. E. (1973). An investor expectations stock price predictive model using closed-end fund premiums. *Journal of Finance*, *28*(1), 67-78. https://doi.org/10.1111/j.1540-6261.1973.tb01346.x