After COVID-19 Epidemic Restriction: Investor Sentiment and Stock Market Response

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Abstract. The economic situation and the direction of the stock market after the pandemic have become hot topics of concern for society. Despite numerous studies on the association between the stock market and investor sentiment, there is a dearth of consolidated and all-encompassing research on the subject in the context of the COVID-19 pandemic. Therefore, this article compiles pertinent information and literature on the stock markets of the United States and China amidst and following the pandemic. It delves into the connection and fundamental drivers between investor sentiment and stock returns, along with market crises, by scrutinizing and organizing the data. From the perspectives of stock returns and market crises, investor sentiment significantly affects long-term stock market returns and the occurrence of market crises by influencing investor behavior. Media orientation, herding behavior, and overreaction further explain the behavior and decisions of investors during this particular period, as well as the repercussions of these steps on the economy and the stock market need to be analyzed. These research findings contribute to a better understanding of market behavior for investors and regulatory agencies, enabling them to formulate strategies and measures to address market fluctuations and risks. The results underscore the noteworthy influence of investor sentiment on stock market returns and during market crises. Additionally, factors such as media influence, herding behavior, and overreaction shed light on the behavior and decisions of investors during this unique period.

Keywords: Investor sentiment; stock return; investor psychology.

1. Introduction

In 2023, the opening year after approximately three years of stringent COVID-19 restrictions and repeated epidemic outbreaks, worldwide economic growth recovery still faces challenges. China, as an example, though Gross Domestic Product (GDP) performance is better than market expectation for the first quarter, after approaching the second quarter, the efforts to restore internal growth drivers have slowed down, and concerns about internal and external risks such as the international situation, real estate and local government debt have increased [1]. In addition, because of epidemic uncertainty and other tense situation in politics and economy in 2022, the total transaction volume of bulk property in China accumulated 220 billion yuan, down 22% year-on-year, increasing commodity prices. Based on that, Consumer Price Index (CPI) and Produce Price Index (PPI) in 2023 constantly reflect that the down trend of inflation [2]. Chinese prospects for a better future require strong targeted support from a series of policies. Behavioral finance theory inspires the perspective that take investor psychology into consideration when evaluating and predicting market behavior. In recent decades researchers have illustrated that investor sentiment, as the main factor of investor psychological states, could further influence the behavior of investment subjects and adjust market and stock price [3]. Investor sentiment is an important indicator of investor's psychological state, and a vital factor of systemic bias. When investors' expectations about the future are systematically biased, biased expectations are considered investor sentiment. Based on this, investor sentiment can be quantified by analyzing data and establishing models, so as to further compare with stock market returns and stock market risks, and ultimately elucidates a positive or negative correlation with stock market. For individual share, comprehensive scrutiny of investor sentiment can aid investors in comprehending how it influences diverse stocks, acknowledging the extent of variation between expected and actual stock returns in irrational situations. From the perspective of policy making, in order to keep China on track to reach its 2023 growth target, the government could have a comprehensive and

comprehensive grasp of the current condition of investor sentiment in the Chinese stock market and to examine the factors that shape it. This paper analyzes the causes behind the situation, promotes the establishment of a virtuous cycle between investor sentiment and Chinese stock market through policies, and provides solutions to solve many challenges in the above economic situation. Relative research can be categorized into two levels. The first level involves in-depth exploration of how to measure investor sentiment, while the second level centered on examining their connection [3]. The study of investor sentiment as a research object and the systematic analysis of relevant measurement indicators were proposed after the emergence of behavioral finance theory. A representative method in this regard is the noise trader model (DSSW) proposed by De Long et al. in 1990 [4]. The model posits that noise traders are investors who form incorrect opinions about the future returns of risky assets. Their erroneous judgments affect market inefficiencies and lead to significant divergences between asset prices and their underlying intrinsic values, resulting in arbitrageurs having to estimate the systematic risk caused by noise traders when making decisions. Based on the DSSW model, Meijin Wang and Jianjun Sun modified the model to more accurately depict the specific attributes of the stock market in China [5]. They obtained a measurement and analysis model that is more suitable for the Chinese stock market and empirically confirmed that investor sentiment is a systematic risk affecting stock returns. To further reduce the impact of market noise, Lixu Chi et al. constructed a model that can more accurately reflect the state variables of investor sentiment using the Extended Kalman Filter (EKF) and Vector Auto Regressive (VAR) models [6]. They explored the impact of sentiment fluctuations on stock returns and the predictive ability of sentiment on future returns. In 2020, Menggang Li et al. proposed a model which analyzes investor sentiment prevailing in the stock market by implementing the Bidirectional Encoder Representations from Transformers (BERT) model [7]. This model achieves relatively high accuracy in measuring investor sentiment and helps reduce the risks of blindness and irrationality when analyzing market investor sentiment measurement.

The study of the relationship between investor sentiment and stock market volatility has become more diverse. In this aspect, Baker and Wurgler proposed an influential theory [8]. By comparing the beta values of different categories of stocks, they found that systematic risk tends to be higher and more susceptible to investor sentiment for stocks that are challenging to assess accurately and exploit through arbitrage. Some researchers have classified investor sentiment into different types to investigate the relationships between different types of investors and investor sentiment, aiming to explore the underlying causes of stock market volatility. Weiqi Liu and Xinxin Liu used the monthly number of newly opened accounts of individual and institutional investors in the Chinese A-share market as a measurement indicator, combined with the Chinese national context, to demonstrate the reciprocal impact of the two categories of investor sentiment and to provide additional evidence for the connection between investor sentiment and stock performance [3]. Kenneth L. Fisher and Meir Statman categorized investors into small, medium, and large investors based on their expertise [9]. They separately evaluated the impact of stock returns on the sentiment of these three types of investors and their correlation with the returns of small-cap and large-cap stocks. Mohamed Zouaoui et al. focused on the international stock market, ascertaining possibility of stock market crisis is positively related with investor sentiment and analyzing the reason behind [10].

In conclusion, research has focused on two aspects related to investor sentiment and the stock market. On the first level, precise measurement of investor sentiment and updating models aims to integrate multiple measurement indicators to achieve a more accurate estimation of investor sentiment at a macro level. Solutions have also been proposed to address the complexity of preprocessing samples in the aforementioned research. On the second level, which focuses primarily on individual stocks, single indicators are used to differentiate between investor types and stock types, and then the differences and connections between investor sentiment and the stock market are discussed through classification. Previous research results indicate that investor sentiment influences stock market returns and crises to a certain extent. However, in the context of the stock market during COVID-19 and post-pandemic era, there is still a lack of extensive research that comprehensively analyzes the psychological and behavioral reasons behind investor sentiment and explores the correlation between

investor sentiment and relevant indicators in the stock market from the perspective of sentiment classification. Therefore, this paper takes the investor sentiment conditions in the US and China under COVID-19 as representative cases. Based on an overview of previous report on the impact of investor sentiment on stock market returns, crises, and investor psychology and logical processes, it attempts to uncover the commonalities of the relationship between investor sentiment and the stock market under different sentiments, as well as the universally applicable policy measures for economic adjustment post-pandemic.

2. Case Description

2.1. Investor Sentiment in United States

The termination process of the COVID-19 pandemic in the United States may be classified into two distinct stages. The first mainly concentrate on the end of strict containment policies. Since 2020, the US has made three attempts to ease restrictions [11]. In early 2022, the US made its third attempt to reopen, and the National COVID-19 Preparedness Plan was made public by the White House on March 2nd, guiding the nation into a phase of relaxed control and coexistence with the virus [12]. The second stage is the official announcement of the declared public health emergency for COVID-19. According to U.S. President Joe Biden and the Department of Health and Human Services (HHS), the U.S. COVID-19 Public Health Emergency is set to finish on May 11, 2023 [13]. The objective of this research is to investigate the link between investor sentiment and the US stock market amidst the COVID-19 crisis and to establish common trends between the two in the specific context of a major event like the COVID-19 outbreak, as well as speculate on the development of their relationship in the post-pandemic era. Research shows that investor sentiment during COVID-19 in America is associated with market returns. Ooi Kok Loang conducted a comprehensive analysis of market returns, investor sentiment, and overreaction during the pandemic in their 2022 research report. Different measures of volatility were used to measure their impact on average excess cumulative return (AECR) as a measure of stock market returns [14]. In the US, investor sentiment is crucial in affecting investor behavior, leading to volatility and overreaction in the market during turbulent periods. According to data from the NASDAQ Composite stock market index provided by Macrotrends, the month-end closing values since the pre-COVID, COVID-19, and termination phases are shown in Figure 1 below.

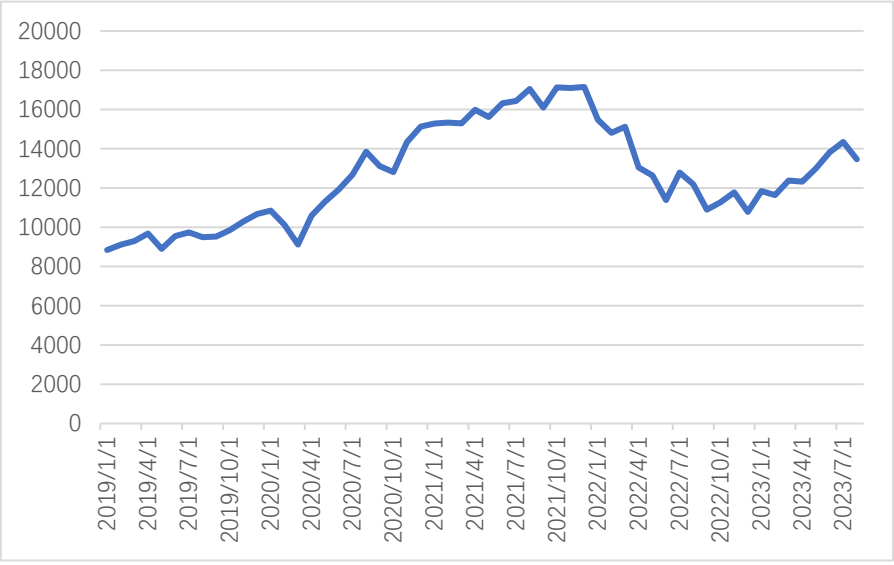

Fig. 1 Monthly development of the Nasdaq Index

Photo credit: Original

Based on Figure 1, as policies were relaxed, there was a resurgence in COVID-19 cases, resulting in a decline in stock market values that continued to decrease. [15] However, in 2023, as the number of cases decreased and the pandemic came to an end, the stock market experienced a rebound.

Assuming that a direct correlation between investor sentiment and the stock market could be established, where a positive effect from one lead to a positive effect on the other, the following hypothesis can be formulated:

H1: There is a notable correlation between the trajectory of investor sentiment and that of the stock market in the United States, both during and subsequent to the COVID-19 outbreak.

2.2. Investor Sentiment in China

Chinese investor sentiment and stock market trends during the pandemic illustrate some similarities with the situation in the United States. Summarizing from the perspectives of policy relaxation and the end of the pandemic, on December 7, 2022, China announced the "New Ten Articles" to ease COVID-19 prevention and control measures, marking the beginning of resumption of work [16]. On February 23, 2023, the Chinese National Joint Prevention and Control Mechanism announced that the current round of the pandemic in China had essentially ended [17].

Building upon the research conducted by Xiaolin Huo and Zhigang Qiu in 2020 on the excessive reaction and market behavior caused by investor sentiment under the COVID-19 pandemic lockdown in China, the study indicates that investors, especially retail investors, faced significant impact from COVID-19 and were more prone to making erroneous judgments and predictions, leading to excessive reactions to unexpected situations [18]. In the case of the COVID-19 outbreak in China, stock market exhibited a reversal effect, where Companies with greater idiosyncratic fluctuations and lower book-to-market values exhibited a tendency to experience poorer performance in the stock market.

Based on data compiled from the Global database and provided by China Securities Index Co., Ltd. during the period from January 2019 to August 2023, the performance of China's stock market index is shown in Figure 2 below [19].

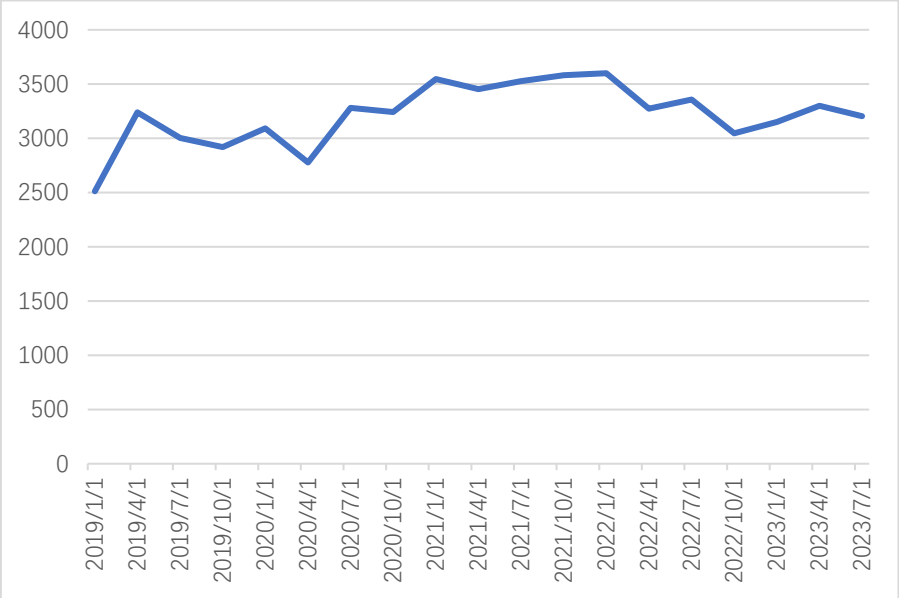

Fig. 2 Quarterly Development of the Shanghai Stock Exchange Composite Index

Photo credit: Original

According to Figure 2, it can be observed that the stock market index trends in China during and after the COVID-19 pandemic show some similarities to those in the United States. The market indices were relatively subdued at the end of 2019 and the beginning of 2020, which further supports the findings of existing research: the Chinese stock market encountered a brief, unfavorable effect due to the COVID-19 epidemic. Similarly, in the post-pandemic era, the stock market prices exhibited a downward trend during policy relaxation and rebounded as the pandemic approached its end. Given that a concrete association between investor sentiment and the stock market can be established,

whereby an optimistic shift in the former could lead to a favorable outcome in the latter, the following hypothesis can be formulated:

H2: There is a noticeable connection between the trajectory of investor sentiment and that of the Chinese stock market, both during and after the COVID-19 outbreak.

2.3. Analysis of the Hypotheses

In order to prove the correctness of the hypothesis, this paper will subdivide the role of investor sentiment on the stock market into stock return and stock market crisis and analyze and explain the relationship respectively. In addition, in order to further establish the internal causal logic model among investor sentiment, investor behavior and stock market feedback, this paper will also discuss investor psychology and the logic behind investor sentiment, thus a more comprehensive explanation of the above hypothesis is given.

2.4. Stock Return

In the context of behavioral finance, stock return is influenced by the psychological and emotional factors that drive investor sentiment and behavior. Stock return is used to describe the monetary profit or loss obtained by an investor by holding a specific stock for a defined duration of time. This can represent either a favorable or unfavorable result, indicating a gain or a loss, respectively, in financial terms. There are two ways to further analysis: establishing mathematical models and verifying real data. This paper will take a relatively representative autoregressive model (VAR) as an example to briefly outline the building process of such a model [3]. Based on the collected time series data, the correlation between the time series data and itself is realized through the autocorrelation coefficient, and the correlation between the time series data and the lag of the monthly data regression model is confirmed by the partial autocorrelation graph. Then the model is fitted according to the determined order.

The VAR models built by Chi are as follows:

$$A_t = \mu + \sum_{i=1}^{p} \Phi_i A_{t-i} + \varepsilon_t \quad (1)$$

Where is the state estimate, is a constant, the investor sentiment state variable, and is the market index return level. Bring in real data such as Shanghai Composite Index returns, VAR model coefficient results. The results show that for the monthly sentiment index, the autocorrelation coefficient is high, indicating that investor sentiment is strongly autocorrelated, that is, if the current investor sentiment is known, it can predict the change in future sentiment. The modest regression coefficient of stock returns in relation to investor sentiment demonstrates a weak correlation between the two variables, indicating that the prediction of future changes in stock returns based on investor sentiment may be unreliable. The level of future stock returns cannot be predicted by investor sentiment alone. As for its variation, the regression coefficient of stock return is high, indicating that short-term fluctuations of investor sentiment will lead to changes in stock return. According to the research about the relation with beta, investor sentiment is an influential factor of systemic risk, and its change will also affect the volatility of the market, thus increasing systemic risk [20]. Therefore, this paper can provide evidence for hypotheses H1 and H2 from the perspective of stock returns.

2.5. Stock Market Crisis

In behavioral finance and investor sentiment, a stock market crisis refers to a period of severe and prolonged decline in stock prices and overall market value. A high level of panic and fear among investors leads to the widespread selling of stocks and a significant decrease in market participation. Based on international equity markets research, it has been found that investor sentiment can increase the likelihood of stock market crises within a year and has a positive feedback effect on these crises [21]. In 2018, a study conducted on the Chinese stock market using a database covering the period from January 2005 to July 2012 used a logit model to provide evidence for the above conclusion in the context of the Chinese stock market and to predict the likelihood of a Shanghai stock market crisis

occurring [22]. The results arrived at the same conclusion as the previous research, demonstrating that the occurrence of stock market crises is considerably heightened by investor sentiment, which suggests the universality of this phenomenon. In summary, this article can provide evidence for hypotheses H1 and H2 from the perspective of the probability of stock market crises occurring.

2.6. Investors Psychology and Logic

In the study by Mohamed Zouaoui et al., a viewpoint is presented that countries with a social and cultural atmosphere characterized by herding behavior, overreaction, and low institutional involvement are more susceptible to the influence of investor sentiment in their stock markets [21]. This suggests that investor sentiment, as a psychological factor, is influenced by multiple complex factors. Market narratives and media influence are identified as major external factors that strongly impact investor sentiment. Changyun Wang and Jiawei Wu conducted a study on the use of emotionally biased vocabulary in mainstream financial media coverage in China [23]. They found that negative sentiment significantly depresses initial public offering (IPO) underpricing and reduces asset prices. Since China has a sizeable population of individual investors with a relatively modest level of investment expertise, there is a tendency for investors to follow the herd and blindly imitate others. Therefore, investor sentiment is easily influenced by media attitudes [5]. Herding behavior and overreaction are crucial internal factors that shape investor sentiment in the stock market. Irrational decision-making and herd mentality among individual investors contribute to herding behavior. When investor sentiment is optimistic, it leads to increased buying activity and rising stock demand, thereby driving up stock prices and potentially generating higher stock returns. Conversely, when investor sentiment is pessimistic, selling pressure may arise, leading to a decrease in stock demand and lower stock prices, resulting in lower stock returns. Due to the positive feedback from media sentiment, investors may overestimate future earnings expectations of companies, leading to increased capital inflows and further amplifying corporate gains, resulting in positive stock return feedback. Similarly, due to herding behavior, when social opinion about a company turns negative, some investors may panic and sell their stocks, prompting others to follow suit due to the herd mentality. This collective behavior of investor sentiment can cause significant market price fluctuations and contribute to market crises. During an unexpected event like a pandemic, people are more prone to a state of panic, and when investor sentiment becomes negative and sensitive, relevant authorities should be vigilant about potential risks of stock market volatility and market crises. Furthermore, investor sentiment can lead to a series of irrational investor behaviors, such as overreaction. Overreactive investor sentiment can result in irrational investment decisions. When investor sentiment becomes extremely fearful, they may engage in impulsive, emotion-driven selling behavior, leading to a rapid decline in stock market prices. Conversely, when investor sentiment becomes overly optimistic, they may engage in blindly investing, driving excessive increases in stock market prices. Such sentiment-driven investment decisions can contribute to excessive market price fluctuations and the emergence of market crises. The prevalence of overreaction during the pandemic has been confirmed in the United States and Europe. Overall, it can be concluded that investor sentiment plays a significant role in shaping stock returns and market dynamics. It is influenced by a variety of factors, including market narratives, media influence, herding behavior, and overreaction. This recognizes this insight emphasizes the crucial role of including investor sentiment as a psychological factor in the analysis and management of stock market risks, particularly during periods of negative and sensitive sentiment, such as during a pandemic [11].

3. Suggestions

In summary, both hypotheses proposed at the beginning of the article are supported, namely, the trend of investor sentiment is significantly correlated with the trend of the stock market in the US and China during and after COVID-19. Furthermore, due to the global and widespread impact of the pandemic, this conclusion can be extended to most countries and regions affected by the pandemic.

In order to promote economic recovery and stock market rebound in the post-pandemic era, relevant authorities can formulate policies or conduct related campaigns to maintain investor sentiment at a relatively positive level without excessive reactions. Regarding investor psychology, particularly the issues of herding behavior and overreaction that are prone among individual investors, national policies and development strategies can promote investor education, focus on developing institutional investors, and encourage rational investment behavior to stabilize investor sentiment [11].

4. Conclusion

The interaction between investor sentiment and the stock market can be utilized to disseminate positive economic and market information. Governments can use media and communication channels to convey positive economic and market information to boost investor confidence and market sentiment. The dissemination of favorable economic data and policy announcements can foster positive expectations for stock market recovery. However, at the same time, caution should be exercised to prevent false propaganda that could lead to greater panic among investors and further market volatility. Simultaneously, policies can support the advancement of Small and Medium-sized Enterprises (SMEs) and encourage innovation and entrepreneurship. Governments can formulate policies to support innovation and entrepreneurship, thereby fostering the growth and development of businesses. This can stimulate economic growth, provide investment opportunities, and boost the stock market. During and after the pandemic, investor sentiment has a considerable influence on the long-term returns of the stock market and the occurrence of market crises. Increased uncertainty exacerbates fluctuations in investor sentiment and market volatility. Emotion-driven investment decisions can lead to excessive market fluctuations that affect the long-term performance of stocks. Overreaction by investors can trigger fluctuations in stock prices, resulting in deviations from their intrinsic worth and adversely affecting long-term returns. Excessive negative emotions can trigger market crises, with collective selling behavior by investors resulting in significant declines and systemic crises. Based on these conclusions, the article proposes three recommendations to promote stock market and economic growth. This research fills a gap in the literature by providing a comprehensive narrative that incorporates psychological findings during COVID-19 and the post-pandemic era. It offers suggestions from the perspectives of the stock market and behavioral finance to foster economic development during this unique period. The findings are valuable for relevant authorities and finance students interested in further exploring these issues. However, it should be noted that some of the data and theories cited in this study may come from earlier articles and could be outdated. Future research should continue to update the modeling of related issues to improve the accuracy of the conclusions.

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