

Analysis of the Changing Trend of Noise Trader Risk in Chinese Stock Market under the Influence of Covid-19

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Abstract. The outbreak of COVID-19 in 2019 has brought huge conflicts to the development of the world economy. As one of the countries affected by the epidemic, China has suffered huge economic losses. At the same time, the follow-up impact of this epidemic is continuous, has not disappeared in the short term and has a large scope. Based on existing research results, this paper analyzes Noise Trader Risk (NTR) and analyzes the factors that are positively related to it, and attempts to prove whether NTR is affected by COVID-19. The research results show that the degree of information asymmetry, market stability, investor sentiment, and turnover rate are all affected to varying degrees by the epidemic, which will lead to an increase in NTR. The research in this paper can provide theoretical reference value for scholars who study the relationship between NTR and COVID-19 in the future. This study has important practical significance for the development of financial markets in the post-epidemic era.

Keywords: Noise Trader Risk; COVID-19; Investor sentiment; Information asymmetry.

1. Introduction

1.1 Research Background

William Sharpe's (1964) Capital Asset Pricing Model (CAPM) at Markowitz is regarded as one of the two cornerstones of modern finance. Under the condition that all investors adopt Markowitz's theory to invest, CAPM uses the simple linear relationship between the expected return of assets and the risk to describe the formation of market equilibrium [1]. This theory has been considered a standard of asset pricing models before the emergence of behavioral economics. Noise traders were first proposed by the Kyle model in 1985, which defined random investors with blindness as noise traders. Then behavioral finance experts Shefri and Statman put forward Behavioral Asset Pricing Model (BAPM) in 1991. Subsequently, Vikash Ramiah and Sinclair Davidson (2001) proposed a Dynamic volume index (DVI) to test BAPM. After their test, it was found that noise traders did have a great influence on the Australian stock market. BAPM tends to be more appropriate when there is a significant influence of noise traders [2].

China is currently one of the largest developing countries in the world. With its huge economic size and key position in the world's industrial production chain, it has an increasingly important position in the hearts of global investors. A unique market phenomenon has been discovered in China, the so-called "policy market". The trend of the stock index has a close relationship with the policies made by the government. It is often reflected in an overreaction of the market to the policy news and even causes the trend of the stock index to deviate from the actual situation. Liu Qin (2019) used the Markov switching model to study and found that the noise figure performance of the Chinese stock market is very unstable [3]. Gan Shugao (2021) drew the conclusion that the NTR in China's stock market is higher than the average of the world through the comparative analysis and processing of stock turnover rate and transaction value change rate [4].

1.2 Research Motivation

However, the outbreak of COVID -19 greatly increased the uncertainty of the economy; it led to the global economic turmoil in 2020 [5]. The Chinese government had introduced a series of effective health policies to prevent the spread of the novel coronavirus, which was likely to have a negative impact on the Chinese economy. In addition, Zhi Su, Peng Liu, Tong Fang empirically studied the

negative benefits of pandemic fear on Chinese stock market returns, and the long-term depressed economic environment would lead noise investors to misprice caused by excessive pessimism [6]. In the composition and influencing factors of China's stock market noise test in this paper, the author thinks the degree of information asymmetry, turnover rate, market sentiment, and the transaction cost and noise composition is a significant positive relationship [7]. Therefore, this paper will discuss the information asymmetry; market sentiment, turnover rate, and other related components that have a positive relationship with noise components through to compare the impact of noise traders on China's stock market before and after the pandemic.

2. Literature Review

2.1 Overview of Noise Trader Risk

The CAPM Capital Asset Pricing Model (CAPM) is based on the relationship between the beta, the risk-free interest rate (typically the Treasury bill rate), and the equity risk premium which equals the expected market return minus the risk-free rate. Moreover, the model is a simple single-factor model through which investors can easily obtain a market portfolio.

Behavioral Asset Pricing Model (BAPM) is based on the Asset Pricing Model (CAPM) and it is a ramification of the application of behavioral finance theory to traditional financial asset pricing theory. This model describes an asset pricing approach based on the interaction between information and noisy investors. BAPM (using DVI as a market index) is used to estimate beta because CAPM may ignore noisy traders. Compared with CAPM, the BAPM model has changed from a sensitive indicator of the change in asset return rate to a sensitive indicator of the change in the behavioral market portfolio. The noise trader risk (NTR) is defined as the difference between conventional and behavioral betas. In a stock market without noise traders, the traditional beta and behavioral beta are equal. However, if the number of noise traders is larger, the risk of noise traders will be correspondingly larger.

2.2 Overview of the domestic situation before the pandemic

China's stock market was volatile and there was obvious noise. Li Xiaoyu (2006) concluded that China's stock market has a high NTR, so CAPM cannot be used to effectively price stocks [8]. Chen Gengxuan (2011) named these three types of noise trading as information noise trading, agent noise trading, and manipulation noise trading respectively, and studied the influencing factors and mechanism of noise trading based on these three types [9].

From the micro level, scholars have studied noise traders from psychology, sociology, and other levels. Vikash Bora Ramiah & Sinclair Davidson further explored the differences between CAPM and BAPM models, classifying noise traders into individual traders, wealthy traders, smart traders, information neutral traders, and even a subset of basic traders [2]. Through the research results of this paper, they find that there are not only noise traders and skilled traders in the market, but more types tend to be among them. Therefore, it is important to study their investment behavior and preference. In addition, the reception and processing of information by different investors is also the key to distinguishing noise traders. The first is the reception of information, which includes information asymmetry. Useful information is not readily available, as the efficient market hypothesis suggests, but rather is available at great cost. Some investors have a strong ability to collect information, while others are difficult for them to get the same information unless they are willing to pay a high unit cost. This is usually reflected in the real stock market, institutional investors have more time, energy, and money to obtain information, while individual investors can only obtain less information. Apart from that, the difference in information processing means that investors will make different decisions regarding the same information. Some investors rely on their own expertise and strong funds to make investments, and they are often able to process information proactively, other investors are not professional enough, the amount of capital is small and only passively process information.

From the macro point of view, the stability of the stock market and the emergence of market heterogeneity also have an impact on noise investors. Gan Shugao (2021) once said that due to the opening of China's stock market, more and more funds enter the market. Different from the relatively mature stocks in developed countries, China's stock market is dominated by individual investors. According to the Shanghai Stock Exchange's 2020 report, individual investors accounted for 52 percent of the total trading volume. After excluding the systemic risks in the market itself, from the perspective of theoretical analysis, they hypothesized that the market is potentially NTR. Based on the gap between behavioral beta and a traditional beta of behavioral asset pricing model, they judge whether there are noise traders in the market. From the perspective of empirical analysis, they demonstrated the existence of noise traders by comparing the turnover rate of stock exchanges in China and other countries. The turnover rate is the frequency of stock trading in a certain period. The higher the turnover rates in the stock market, the greater the risk. After comparison, it is found that there is a serious noise phenomenon in China's stock market, because the turnover rate of China is much higher than that of other stock exchanges, about 3 to 6 times. In the stock market, changes in trading volume can usually reflect investor preferences, and the more stable the data, the more stable the market. However, after they calculating, the author found that the change rate of the transaction amount in China's stock market is not only high but also volatile [4]. Market heterogeneity refers to following the thoughts or behaviors of the masses only through learning and imitation, also known as the "herding behavior". Zhang Y, Zheng X tested the herding behavior level of Chinese investors through the LSV model. The research results show that due to the different policies between China and other countries, individual investors account for the majority in China's stock market. So, the Chinese stock market is more prone to herding behavior. This situation is especially significant when the market has obvious rise and fall [10].

2.3 Impact of the pandemic on investors:

Noise investor behavior is amplified in the stock market. The impact of COVID-19 on China's financial markets is unusually obvious and persistent, and individual investors react more strongly to the COVID-19 outbreak [11].

From the micro side, due to being affected by the pandemic, investors' sentiment and outlook for the investment market have become worse. Xiao Xiao Li (2008) used the research framework of the DHS model to establish an asset pricing model based on investor sentiment. This paper mainly demonstrated the influence of investor sentiment on asset pricing and used this model to explain abnormal phenomena such as overreaction and excessive volatility in the security market. Therefore, it is concluded that the existence of investors' sentiment traders on long-term market returns leads to an increase in short-term asset price volatility [12]. In the study of Lin Sun (2022), the DID model was used to study the impact of COVID-19 on investor sentiment in China's financial markets. The improved turnover rate is used to measure investor sentiment towards individual stocks. The study found that the pandemic led to a decline in market turnover rates and investor pessimism, and investor sentiment was an important factor leading to volatility in financial stock markets. The authors provide evidence through natural experiments that large-scale public health emergencies can affect investor sentiment, which in turn affects stock returns and trading volume [13]. Investors may be pessimistic about the investment outlook in a particular market; they sell the stocks in that market in the event of an infectious disease outbreak.

In order to hedge against the negative impact of uncertainty, investors also receive and process information differently than they did before the pandemic. Investors are willing to pay higher prices and accept lower expected yields for stocks with higher uncertainty factors., on the other hand, when a new isolation policy is introduced, some noisy traders' random beliefs transfer to pessimistic beliefs. At that time, they tend to sell those affected by trade policy uncertainty negative equity. Therefore, the investment behavior will lead to the uncertainty factor lower stock was sold a lot. It has intrinsic value underestimated when the uncertainty of trade policy easing and undervalued stocks will be

produced. The price of raw stocks will rebound, and the expected return rate will be higher. This phenomenon also leads to more volatility in the market.

From the macro side, the stability of the market and the uncertainty of news make investors more sensitive. First of all, the market became more unstable. Chen Fenggong (2020) used the dynamic analysis results to show that the stock return rate showed a volatile fluctuation during the pandemic, but the overall trend still showed a downward trend, while the stock volatility showed a continuous upward trend during the pandemic [14]. In addition, COVID-19 is the biggest uncertain event in the world, especially under the condition of high-speed Internet information dissemination. It has brought a huge impact on enterprise production, industry development, and the daily life of the public. Tian Jinfang (2020) found that in China's stock market, some stocks are defined as COVID-19 concept stocks. When the epidemic situation worsens around the world, the expectation of the Chinese people to fight against the epidemic also increases. COVID-19 concept stocks are more likely to be concerned and sought after by investors. This indirectly affects the investment decisions of investors and then affects the trend of stocks. Besides, this literature revolves around COVID-19 uncertainty events, and the authors construct proxy variables that investors focus on from two dimensions: market and event. The high public attention to the uncertain events may promote traditional overconfidence, which leads to the increased risk of uncertainty in the stock market and the volatility of the stock market, which makes it possible to have more noise traders in the Chinese stock market [15].

3. Conclusion

In the context of the globalization of the epidemic, this paper sorted and classified the existing research results, compared and analyzed the research before and after the epidemic. In summary of the relevant kinds of literature about the impact of noise traders on China's stock market in recent years, this paper has been inspired a lot. In the process of research, this paper guessed that the expansion of the current epidemic scale makes the effect of noise traders more significant in the Chinese stock market. The research shows that investors' sentiment and prospects for the investment market have become worse from a micro perspective under the pandemic, because of the stress caused by the prolonged pandemic. From a macro perspective, market instability and uncertainty about news make investors more sensitive, and the emergence of concept stocks and the impact of China's policies make it easier for investors to form a convergence effect. However, the research in this paper has many limitations. Due to the lack of empirical research, the final results remain to be investigated. Secondly, there is currently no very accurate and reliable way to measure noise trader risk, and its exact value is hard to estimate. In addition, due to the stimulus of the external environment, the stock market information is easy to change, which leads to the analysis of several viewpoints in this paper being too single.

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