The Logic and Analysis of Irrational Investment Behavior

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Abstract. Purpose/Background: The purpose of this study is to apply the case study method and examine the linkage mechanism of irrational investors' behavior based on the case of the 2021 U. S. GameStop short squeeze event. The reason for selecting the case is based on the fact that the stimulus checks of the U. S. government during the event could be used as a sample of 'mental accounting. Method/Case: The purpose of this study is to explore the manner in which this 'windfall gain' created an overconfidence in retail investors, which, with the assistance of 'mental accounting, ' took the extreme form of a 'disposition effect, ' or the tendency to hang on to stocks for an extended period of time without selling them, even in the face of a significant price fall. Findings/Analysis: The methods that this study will employ are the review of the empirical data provided by the media and the discussions on the social platform in an attempt to build an integrated model to evaluate the interactive logic and impact of the three major biases at different stages. Conclusion/Implications: The proposed framework for the article is as follows: first, introduce the background of the GameStop Corp. event and the theoretical basis of the three major biases; second, use evidence related to stimulus checks to focus on analyzing the linkage mechanism among the biases and construct a model; finally, compare the empirical results of the case.

Keywords: Irrational Behavior, Investment Decision, Meme Stock

1 Introduction

1.1 Research Background and Problem Statement

This section will introduce the role of the 2021 GameStop Corp (GME) event during its occurrence in the financial market, and why traditional theories of price discovery and correction, as proposed by the efficient market hypothesis, are not sufficient to explain this event. Based on this, it will explore how the combination of the three most important behavioral biases, namely mental accounting, overconfidence, and the disposition effect, developed a symbiotic relationship and a synergistic catalytic role in this event.

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According to the traditional financial theory structure, based on the rational man hypothesis and the efficient market hypothesis, the prices of securities are assumed to sufficiently and timely reflect the true value of the security.

However, the GameStop short squeeze event that occurred in early 2021 posed a tremendous challenge to this traditional financial theory in a most dramatic way. The stock price of a financially distressed physical retailer deviated from financial logic within a very short time, from $20 to a peak of $483, a growth of more than 2300%. As a result, numerous hedge funds, such as Melvin Capital, sustained huge financial losses from the liquidation of their short positions, even leading to a risk of local financial market liquidity. This financial event poses a very challenging question to the financial world: how does the traditional financial theory of price discovery and correction, as proposed by the efficient market hypothesis, distort in a systematic way if a collective consensus of retail investors, through social media, leads to a consensus on financial decisions?

1.2 Research Significance

From a behavioral finance perspective, the GME event is not an isolated instance of speculative fluctuation but empirical evidence of the interplay of multiple cognitive biases. Studying this topic not only helps to understand the formation mechanism of this extreme historical event but also provides important theoretical support for deeply understanding the amplification mechanism of asset price volatility in the era of social media and the accumulation process of market liquidity risk.

1.3 Research Ideas and Methods

Most studies on the irrational behavior of investors, such as the studies by Zhou Ye and Zhang Ran, have focused on the analysis of individual biases without considering the symbiosis and logic of the linkages among various biases during the whole process of decision-making. The purpose of this study is to take the event of the GME as an entry point to build the linkage model with the starting point of the mental accounting theory, the reinforcement point of the overconfidence theory, and the endpoint of the disposition effect theory [1].

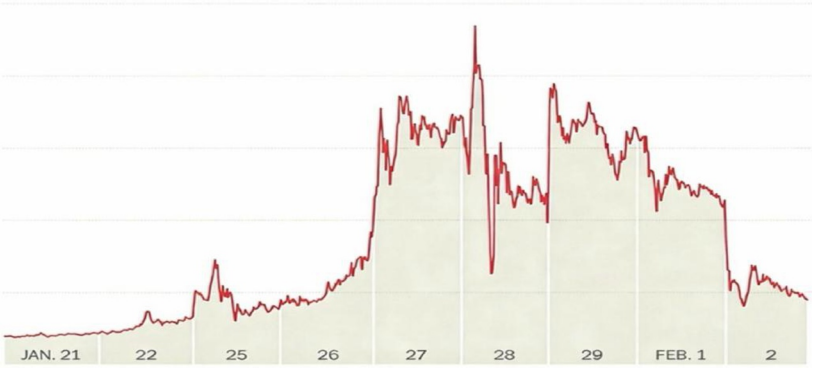


Fig. 1. Abnormal Fluctuation Trend of GameStop (GME) Stock Price from January to February 2021 (Picture credit:Original).

As shown in Figure 1, the stock price of GameStop (GME) experienced fluctuations completely its fundamentals in late January 2021, peaking at $483. This abnormal trend intuitively maps the dynamic linkage process of the three major irrational biases among retail investors.

First, in the initial phase on the left side of the chart, it coincided with the disbursement of U. S. government pandemic relief funds. This "windfall gain" activated the mental accounting of retail investors, significantly enhancing the group's risk tolerance and providing ample unburdened capital for the initial price increase.

With continuous inflow of funds, the stock recorded an irrational peak in its stock prices around January 28th. This irrational peak in stock prices is an indication of the peak in overconfidence among retail traders. This is due to “sentiment infection” effects of social media groups such as Reddit.

Lastly, with the right side of the chart showing an extremely sharp fall in stock prices, it is evident that the market did not experience the expected panic selling, but rather intense. This is an indication of an extreme disposition effect.

1.4 Thesis Structure Arrangement

The pandemic relief checks by the U. S. government are specifically considered as a significant environmental factor for this study.

Based on the reports by CNBC and relevant empirical studies, it has been observed that there is a significant positive temporal correlation between the disbursement of $1, 400 “stimulus checks” for every individual and the increase in retail trading volume [2].

The logical transmission path for this study can be expressed as follows:

External capital injection → Change in individual risk boundaries through "mental accounting" → "Overconfidence" through information from social networks → "Disposition effect" in the stock price phase

This paper tries to make it clearer how these three significant biases achieve linkage in terms of capital, cognition, and decision-making, and thus offers a new perspective for analyzing the behavioral of investors in complex market environments. In terms of improving the existing research, the marginal contributions of this paper are mainly reflected in the following aspects:

1. Integration of Theoretical Perspectives: The limitation of the previous studies was that they only focused on "overconfidence" or "disposition effect" and built the linkage analysis framework of "Mental Accounting - Overconfidence - Disposition Effect, " which shows the symbiosis and dynamics of irrational biases in the market environment.

2. Empirical Introduction of Situational Variables: It was the first study to introduce the variable of 'pandemic relief payments' into the analysis model, and more specifically, the role of 'windfall gains' in alienating the risk preference of investors, presenting new evidence of the unintended effects of macro policies on micro individual behavior.

3. Mechanism Analysis of Social Finance: Based on the collective narrative characteristics of the information flow of the Reddit forum, it is obvious how social media information flow works as a "catalyst" for enhancing individual cognitive biases, and

this study enriches the analysis of the formation mechanisms of herding phenomena and price anomalies in Internet finance.

2 Theoretical Basis

2.1 Theoretical Perspectives of Behavioral Finance

Conventional finance theory, as justified by the "Efficient Market Hypothesis" (EMH) and the "rational man" theory, assumes that investors are capable of processing information rationally and making decisions that are geared towards attaining utility for themselves.

However, the presence of various market anomalies such as asset bubbles, herding behavior, and volatility suggests that in practice, the behavior of investors does not follow the rational paradigm. In addition, even if the information is publicly available, the cognitive ability of the investor is limited. Thus, it is important to discuss the "completely rational processing of all information" without considering the cognitive ability of the investor.

Behavioral Finance, as a theory that traditional financial theory integrates, draws from psychology and sociology, emphasizing the impact of cognitive biases and emotional factors in the financial decision-making process [3]. The purpose of this study is to explore the three most common theories of Behavioral Finance, namely, mental accounting, overconfidence, and disposition effect.

2.2 Mental Accounting

The theory of mental accounting was developed by Thaler in 1985. The theory of mental accounting is intended to describe the process by which individuals mentally represent and evaluate money. The theory of mental accounting helps to reveal the process by which individuals make financial decisions.

Unlike the assumption of "fungibility" of money in traditional economic theory, mental accounting theory proposes that individuals divide their money into distinct mental accounts depending on their source or utilization, indicating that individuals have distinct risk attitudes towards money. This is, in fact, an indication of the framing effect, where individuals exhibit distinct risk preferences and decision-making behavior for the same amount of money depending on the label that is given to the account in which it is placed [4].

More specifically, individuals tend to treat unearned income, e.g., government subsidies or gambling money, as "windfall gains" that go into "entertainment accounts" or "gambling accounts" with more risk-taking propensity. Under the influence of the above psychological mechanism, there is usually a "house money effect" in which investors tend to have much lower sensitivity toward losses in relation to their funds. This is totally unlike the logic of traditional utility functions in which investors have more or less constant sensitivity toward losses in relation to any amount of funds. This, in turn, makes them more likely to engage in high-risk speculation.

2.3 Overconfidence

Overconfidence is one of the cognitive bias phenomena that take place in the domain of behavioral finance. It is defined as the tendency of an individual to overestimate his or her knowledge level, information gathering skills, and control over the events taking place. In the process of trading in the securities market, the overconfidence bias is revealed in the perception of the investors that they possess "private information" that is superior to the average information provided in the market. This makes them overtrade and underestimate the risks [5].

The mechanism of the formation of overconfidence bias in the context of the development of social media:

The development of social media has led to changes in the overconfidence bias formation mechanism. According to the research carried out by Xiao Xinrong & Zhang Haotian, the improvement in the investment confirmation bias in the context of the presence of online communities such as Reddit contributes to the overconfidence bias. In this context, if the majority of the retail investors express similar positive sentiments regarding the investment platform in the social media environment, the individual will be under the illusion that the information possessed by the crowd is superior to the information provided in the institutions. This phenomenon makes the individual believe that the event is due to the judgment power of the individual and that the overconfidence level is high.

2.4 Disposition Effect

The disposition effect, which was developed by Shefrin and Statman in 1985 in accordance with Prospect Theory, is an attempt at explaining the behavioral pattern of an investor in stock trading, which is defined by the disposition effect as "the tendency to sell winning stocks too early and hold losing stocks too long. " The psychological factor behind the disposition effect is loss aversion. When an investor is motivated by gains, then they will exhibit behavioral tendencies that are risk-averse in an attempt to achieve their gains. When an investor is motivated by losses, then their behavioral pattern is likely to be risk-seeking in an attempt to make up for their losses [6].

Empirical studies carried out by Li Xindan et al. on domestic investors indicated that there is also the disposition effect among domestic investors. The impact of extreme market environments that encourages buying and investing without any consideration for risk may be transformed into inflexibility and behavior that is akin to "refusing to stop losses, " which may further fuel illiquidity in the market due to falling asset prices and irrational behavior in the market [7].

3 Introduction to the Case

3.1 Event Background

GameStop Corporation, or GME, is a brick-and-mortar retailer of video games in the United States. The company’s financial performance continued to deteriorate in 2020

because of the COVID-19 pandemic and the delay in embracing digitalization. Its shares traded in a band of $4 to $10 for a long period of time. Based on the bearish assumptions about GME's fundamentals, several Wall Street hedge funds, such as Melvin Capital, took massive, short positions in the company's shares. According to the data, GME's short interest was as high as 140% of its outstanding shares in early 2021. This concentration of short-selling positions formed the potential for the subsequent "short squeeze" event.

3.2 The Reddit Community's Assembly and Confrontation

The turning point of the event occurred on a subreddit forum, r/wallstreetbets (WSB). A key opinion leader, Keith Gill (online pseudonym Roaring Kitty), argued that GME was severely undervalued by publishing detailed financial analysis and screenshots of his holdings, also pointing out the liquidity vulnerabilities in the institutions' short-selling operations. This view rapidly spread within the community and evolved into a 对抗 narrative of "retail investors vs. Wall Street, " carrying emotions related to social inequality.

Notably, during this period, the U. S. government began distributing a new round of pandemic relief funds (Stimulus Checks). Numerous retail investors entered the market through trading platforms like Robinhood. By mid-January 2021, as a large number of retail investors purchased common stock and call options, short-selling institutions were forced to cover their positions, which further propelled the stock price upward, subsequently forming a "gamma squeeze. "

3.3 The Peak of Irrationality and "Diamond Hands"

On January 28, 2021, the GME stocks traded at an all-time high of $483, which was an increase of over 2000% from the beginning of the month. GME stocks' market capitalization was completely out of its fundamental logic. Securities companies such as Robinhood, affected by extreme market volatility, suddenly placed restrictions on the purchase of GME stocks, which consequently caused the price of GME stocks to fall.

However, despite the sharp fall in the stock price that occurred subsequently, with the price falling to around $50 in just one week, the spread of the popular slogans such as "Diamond Hands" referring to investors who hold their stocks and "HODL" referring to the popular term Hold On for Dear Life and the act of holding the stocks in the face of fluctuations in the stock price was seen in the wider community of the Reddit platform. This was seen as the irrational behavior of the investors in the loss domain, in that they were taking their time to realize the losses. The majority of the retail investors were in the condition of having unrealized losses of up to 50%, and even up to 80%, but they were not selling the stocks.

4 Case Analysis

4.1 Mental Accounting Theory and its Application in Investment Behavior

The stimulus checks distributed by the U. S. government were the crucial external variable that initiated this linkage mechanism. According to research by Huang Yirong and Zheng Fangyong, upon the injection of direct cash amounting to $1, 400, this cash was clearly labeled as "windfall gain" in the mental accounts of retail investors, rather than "hard-earned money" [2].

In the context of the GME event, this type of fund attribute directly reshaped investors' risk preferences. Since the money was seen as "unearned income," its psychological cost was relatively low. When investors put these funds into high-risk assets like GME, they may have framed potential losses differently in their minds, thinking that "even if I lose it, I'm just back where I started," rather than viewing it as losing their existing wealth. This way of thinking reveals a complex link between how people assess potential losses and their psychological expectations. Known as the "house money effect, " this pattern weakens the usual focus on protecting principal in traditional investing, thus offering relatively solid financial backing for subsequent high-risk bets.

4.2 Overconfidence and the Role of the Information Environment

While mental accounting gave individuals the "confidence to take risks," social media supplied the "reason to take risks." On the WallStreetBets (WSB) forum, retail investors built a unique shared narrative by sharing trading screenshots (YOLO posts) and creating memes.

Zhou Ye and Zhang Ran pointed out that this high-density information interaction led to strengthening individuals' subjective judgment of outcome controllability, a phenomenon known as "illusion of control" [1].

Attribution Bias: During the early phase of the GameStop (GME) stock price, retail investors tended to attribute their paper gains to their own intellectual performance in "beating Wall Street, " rather than to the short-term mismatch of market liquidity.

Group Polarization: The platform mechanisms of social media, through functions like likes and comments, diminished the expression of rational risk warnings. Comments holding negative views were often labeled as "traitors. "

In this environment, individual overconfidence was significantly amplified by group emotions. Investors believed they could control pricing power. This overconfidence directly led to a notable increase in trading frequency and triggered irrational behavior such as chasing rising prices.

4.3 The Disposition Effect and the Persistent Impact of Loss Aversion

When the GME stock price peaked and began to decline, the linkage mechanism entered a critical period, which can be called the "locking-in stage." According to rational logic, in the absence of significant fundamental improvement and during a substantial price drop, investors should consider adopting timely stop-loss strategies.

However, in the GME case, a significant phenomenon termed the "disposition effect, " specifically the "diamond hands" phenomenon, was observed.

This phenomenon is a logical consequence of the previous two stages.

The Subsequent Impact of Mental Accounting: Because the entry funds were perceived as "windfall gains, " investors' perception of losses was somewhat diminished. Relevant research clearly indicates that an individual's cognition of the source of funds can potentially influence their decision-making behavior. Under the influence of specific circumstances, individuals may develop psychological cues like "it's money from the government anyway. " Such cognitive tendencies may reduce the urgency to sell at a loss when facing losses.

Overconfidence and Sunk Costs: Having previously been influenced by social media, investors developed extreme confidence, which made acknowledging losses tantamount to admitting "faith collapse" or "surrendering to institutions. " To maintain self-consistency, retail investors chose to "hold stubbornly" as a way to deal with the discomfort caused by cognitive dissonance [8].

Therefore, while mental accounting lowered the psychological cost of holding positions, overconfidence raised the mental bar for admitting mistakes. Together, these two biases helped sustain the disposition effect throughout the GME event, which eventually caused many retail investors to suffer significant real losses as the stock price moved back toward rational levels.

4.4 Linkage of Behavioral Biases and Their Role in Driving Market Anomalies

To sum up, the actions of retail investors in the GME event can be broken down into the following sequence: An external trigger—such as the government issuing fiscal subsidies during the pandemic—activated the “gambling mental account,” sharply increasing retail investors’ willingness to take risks. At the same time, social media further fueled this mindset, pushing retail investors toward a shared sense of “overconfidence” [9,10]. In the process of forming this collective overconfidence, retail investors may have used selective attention to ignore price signals that contradicted their views.

In the end, this not only led to a crash in the stock price but also triggered a distorted “disposition effect,” causing retail investors to refuse to cut their losses. This chain of behaviors suggests that irrational biases do not occur in isolation; rather, they show strong interdependence and a clear sequential pattern.

5 Conclusion

In summary, past studies have looked closely at mental accounting, overconfidence, and the disposition effect. Researchers have also found that these three ideas are related to one another. But most current studies still focus on one bias at a time. They also tend to look at things in a fixed way, without considering how biases change over time. Few studies try to build a model that shows how multiple biases connect and work together. This paper tries to build such a model. It brings together these three

biases into one connected framework. Using the GME event as an example, it shows how mental accounting, overconfidence, and the disposition effect influence each other. It also shows how they make each other stronger in extreme market situations.

The goal is to give a new way to think about collective irrational behavior among retail investors. It also provides real-world evidence for that way of thinking. To better understand why this kind of group irrational behavior happens, researchers can look at a few things.

First, cognitive biases can lead investors away from making rational choices. Second, market mood and social factors also play a big role in investor decisions. This is especially true when group pressure is high. In those cases, investors often follow the crowd. Because of this, educators need to strengthen investor education. They also need to make information more open and clearer. These steps can help investors notice and avoid the effects of different cognitive biases. In the end, that will make the market more rational overall.

Thus, information asymmetry and bounded rationality can also make people act in irrational ways when making financial decisions. By understanding these factors, educators can better understand how complex investor behavior really is.

Authors Contribution

All the authors contributed equally and their names were listed in alphabetical order.

References

1. Zhou Y, Zhang R: Analysis of retail investor behavior in the “GameStop” event: From the perspective of behavioral finance. Financial Theory & Practice, (6), 45–52 (2021)
2. Huang Y R, Zheng F Y: The impact of U.S. fiscal stimulus policies on household investment behavior during the pandemic. Studies of International Finance, (9), 25–36 (2021)
3. Rao Y L, Sheng H: Behavioral finance. China Machine Press, Beijing (2010)
4. Chen S, Liu D: Mental accounting and irrational investment decisions: A theoretical review. Management Review, **30**(4), 3–13 (2018)
5. Yu P K, Huang J: A review of research on investor overconfidence. Chinese Journal of Management, **14**(3), 462–472 (2017)
6. Wang C Y, Wu J W: Disposition effect of Chinese investors: An empirical study based on account data. Journal of Financial Research, (8), 153–167 (2015)

7. Li X D, Wang J N, Fu H: An empirical study on trading behavior of individual securities investors in China. Economic Research Journal, (11), 54–63 (2002)
8. Zhang W, Zhang Y J: Formation mechanism of market bubbles from a behavioral finance perspective: The case of the GameStop event. Nankai Business Review, **24**(4), 149–160 (2021)
9. Umar Z, Yousaf I, Zaremba A: Comovements between heavily shorted stocks during a market squeeze: Lessons from the GameStop trading frenzy. Research in International Business and Finance, **58**, 101453 (2021)
10. Umar Z, Gubareva M, Yousaf I, Ali S: A tale of company fundamentals vs sentiment driven pricing: The case of GameStop. Journal of Behavioral and Experimental Finance, 30, 100501 (2021)

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