

A Study on Investor Behavior Deviations and Governance in China's Gold Futures Market

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Abstract. As a key component of China's financial market for effectively achieving risk hedging, price discovery, and serving the real economy, the gold futures market has seen a steady rise in trading activity in recent years. However, irrational trading behaviors among investors—such as chasing price surges and selling during dips, as well as excessive short-term speculation—remain prominent. The "rational man" assumption in traditional financial theory struggles to explain such phenomena, while theories related to "bounded rationality" and "behavioral biases" in behavioral finance provide a fresh analytical perspective for dissecting these market issues. Drawing on publicly disclosed data from authoritative institutions including the Shanghai Futures Exchange and the China Futures Association, this study conducts a systematic analysis of the behavioral bias characteristics of investors in China's gold futures market from three core dimensions: herd effect, prospect theory bias, and anchoring effect. It identifies the amplifying role of market mechanism defects and lagging regulatory education on these behavioral biases, and puts forward targeted countermeasures such as optimizing the investor structure, improving market operation mechanisms, and building a behavior-oriented regulatory system, thereby offering support with both theoretical value and practical significance for promoting the steady development of the gold futures market.

Keywords: Gold futures market, behavioral finance, investor behavioral bias, market mechanism, behavioral regulation

1. Introduction

Against the backdrop of global geopolitical conflicts and the normalization of commodity price volatility, gold's safe-haven attributes have become increasingly prominent. Simultaneously, the Federal Reserve's interest rate cut cycle in 2024 (three cuts throughout the year, bringing the federal funds rate down to 4.50%-4.75%) further strengthened gold's anti-inflationary value, leading to explosive growth in the trading volume of China's gold futures market. According to the Shanghai Futures Exchange's "2024 Gold Futures Market Report," the trading volume of gold futures reached 73.8 million lots in 2024 (a year-on-year increase of 39.9%), with a turnover exceeding 41.91 trillion yuan (a year-on-year increase of 75.81%), placing China's gold futures market among the world's largest gold futures markets. However, irrational market characteristics remain significant: On April 22, 2025, the single-day trading volume of Shanghai Gold Futures reached a

record high of 989.25 billion yuan, almost equal to the total trading volume of stocks on the Shanghai and Shenzhen stock exchanges that day. This unsustainable, massive trading volume is a typical signal of market overheating. A large number of investors have engaged in "borrowing money to gamble on gold prices," with some using credit card cash advances, consumer loans, and online loans to raise funds for the market. Cases show that investors have used this method to accumulate principal ranging from 600,000 to 1 million yuan, and then leveraged this capital through futures trading. Traditional financial theory's "rational man" assumption struggles to explain this phenomenon, while behavioral finance's research on "bounded rationality" and "behavioral biases" offers a new perspective for analyzing market issues.

This study helps to break through the limitations of traditional assumptions, accurately identify new market changes in 2024 (such as the strengthening of the anchoring effect under the interest rate cut cycle), and provide policy references for rational investor decision-making and market stability under the "high gold price, high volatility" market conditions of 2025. Meanwhile, to ensure the rationality and rigor of the proposed solutions, a multi-dimensional research method and a clear logical approach are employed. First, a literature review is used to systematically review classic behavioral finance theories by Kahneman, Tversky, Shiller, and other scholars, as well as authoritative empirical findings from some Chinese scholars, establishing a theoretical foundation. Second, a data analysis method is used, relying on publicly available data and reports from authoritative institutions such as the Shanghai Futures Exchange and the China Futures Association to objectively describe the current market situation and trend characteristics. Furthermore, a case study is introduced, using typical events such as the "failure to meet interest rate cut expectations triggering concentrated liquidation" in June 2024 as examples to illustrate the actual impact of behavioral biases on the market.

2. Literature review

2.1. Application of behavioral finance theory in the futures market

The prospect theory proposed by Kahneman and Tversky reveals that investors are more sensitive to losses than to gains, and exhibit different risk preferences in scenarios of gains and losses, providing a core theoretical basis for analyzing the decision-making behavior of futures investors (inspiring the analysis of investors' holding behavior when they are profitable/lossy in the "Prospect Theory Bias: Loss Aversion and Risk Preference Alienation" section of this paper) [1]. Shiller's research on the herding effect shows that investors' herding behavior will exacerbate market volatility, and this conclusion provides a theoretical basis for the analysis of the phenomenon of "concentrated trading by individual investors under the expectation of interest rate cuts in 2024" [2].

2.2. Research on behavioral bias in the domestic gold futures market

Huang Guoxuan et al., from the perspective of price discovery function, combined with relevant empirical analysis, inspired this paper to explore the phenomenon that 'market mechanisms amplify behavioral biases' [3]. Xiong et al. analyzed the impact of investor sentiment on the functions of the stock index futures market, providing a methodological reference for this paper to quantify the "market impact of herding effect and anchoring effect" [4]. Tian et al., based on daily frequency data of 27 commodities from 2005 to 2013, used the Markov zone conversion GARCH model to systematically test the overall herding behavior of the Chinese commodity futures market for the first time, providing key evidence for subsequent data analysis of the trading volume of the gold

futures market in March 2020 [5]. Based on a wider range of commodity futures data, Kuang et al. not only robustly proved the existence of the anchoring effect, but also found through multi-agent simulation that "the impact of the anchoring effect varies depending on the type of investor—arbitrageurs' anchoring reduces market volatility but weakens price discovery, while speculators' anchoring may simultaneously reduce volatility and enhance price discovery." This provides a new perspective for understanding the complex effects of behavioral bias [6]. Zhang et al.'s summary of the stage characteristics of the development of China's futures industry and their outlook on future development helped the author to understand the overall situation of China's futures market more deeply and to capture the shortcomings of the existing market mechanism and financial supervision [7,8].

2.3. Research gaps and the innovations of this paper

Existing research largely focuses on market characteristics in 2023 and earlier, paying insufficient attention to the new manifestations of behavioral biases in 2024 under the background of "interest rate cut cycle + trading volume surge" (such as anchoring to the number of Fed rate cuts rather than actual interest rates); and lacks a systematic analysis of the interaction between "behavioral biases, market mechanisms, and regulatory education." This paper attempts to fill this research gap by combining the latest data and cases from 2024-2025.

3. Typical manifestations of investor behavioral biases in China's gold futures market—based on behavioral finance theory

3.1. Herding effect: price fluctuations caused by following the crowd

Specifically, individual investors account for a large proportion of participants in China's gold futures market, whose trading decisions are often influenced by market sentiment rather than fundamental analysis. In China's gold futures market, individual investors constitute a significant portion of the participants. Their trading decisions are often influenced by market sentiment and consensus expectations, rather than being based solely on fundamental analysis. This environment fosters a herd mentality, where investors, when faced with uncertainty, tend to observe and imitate the behavior of others, leading to irrational collective trading characterized by "buying high and selling low," amplifying market price volatility. Taking the trading volume and month-on-month changes in the gold futures market from March to June 2024 as an example, in March, the Federal Reserve signaled three rate cuts this year, causing trading volume to rapidly reach 6.3774 million lots, a month-on-month surge of 208.86%, attracting a large influx of investors and forming a herd mentality of "buying on the sidelines." In April, trading volume further climbed to a peak of 10.6762 million lots, but the month-on-month growth rate had significantly decreased to 67.41%, indicating that while market sentiment remained high, the driving force had weakened, and some investors may have begun to adopt a wait-and-see approach. The turning point came in May, with trading volume plummeting to 5.7788 million lots, a sharp decline of 45.87% month-on-month. This reflected a synchronized sell-off by investors when market uncertainty or shifts in expectations arose. In June, trading volume continued to fall to 4.2456 million lots, a 26.53% decrease month-on-month, though the decline was less pronounced than the previous month. This indicated that market panic had eased somewhat after the sharp fluctuations, but overall trading activity had declined, and the impact of the herding effect, while gradually diminishing, still persisted. It is worth noting that, in addition to retail investor sentiment, the continued gold purchases by global central banks and

market speculation regarding the Federal Reserve's policies were the more crucial macroeconomic factors driving this round of gold price volatility. This high degree of synchronization in trader behavior driven by macroeconomic events is a typical manifestation of the herding effect. This finding corroborates the conclusion of Tian Lihui et al. that "the herding effect is more pronounced in markets dominated by individual investors during a downtrend"[5].

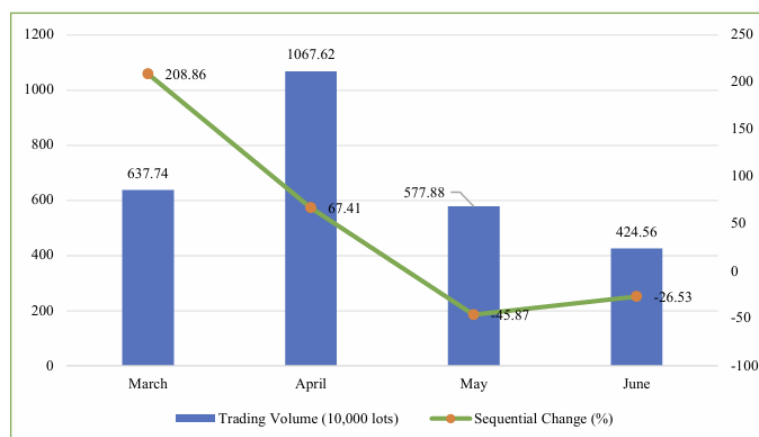


Figure 1. Trading volume and month-on-month change trend of China's gold futures market from march to June 2024

Figure 1 depicts the trend of transaction volume and month-on-month changes in my country's gold market from March to June 2024. It shows the irrational large-scale buying by individual investors after hearing uncertain information, namely "three interest rate cuts this year," and the concentrated selling after their expectations were not met. This well illustrates the existence of the "herd effect" in China's gold futures market.

3.2. Prospect theory bias: loss aversion and risk preference distortion

According to prospect theory proposed by Kahneman and Tversky, investors are far more sensitive to "losses" than to "gains," and tend to be risk-averse in gain scenarios and risk-seeking in loss scenarios [1]. This prospect theory bias is particularly pronounced in the Chinese gold futures market. Based on data released by the China Futures Association, significant asymmetry in investor behavior can be observed: on the one hand, investors generally exhibit a tendency to close positions prematurely when profitable, with most choosing to quickly close their positions after achieving a certain profit, potentially missing out on subsequent gains. On the other hand, when facing losses, investors often exhibit a reversal of risk preference, tending to continue holding or even increase positions in an attempt to recover losses; this disposition effect amplifies investment risk. It should be noted that due to the non-public nature of investor trading data in the Chinese futures market, obtaining precise micro-statistics on holding periods and trading frequencies under profitable and loss-making conditions is somewhat limited. Existing studies mostly rely on questionnaire surveys, institutional sampling data, and macroeconomic market performance for indirect inference. Despite constraints in data acquisition, typical effects of prospect theory bias can still be identified through market observation and case analysis. For example, during the sharp market volatility in 2024, investors tended to prematurely sell profitable positions when prices rose rapidly, while holding onto losing positions or even adding to them against the trend when the market fell. This behavioral

pattern is highly consistent with the predictions of prospect theory, further exacerbating the volatility of their own investment performance and the overall instability of the market.

3.3. Anchoring effect: over-reliance on single information leads to decision-making deviation

Investors tend to anchor themselves to single pieces of information (such as international gold prices or Federal Reserve policies), ignoring domestic supply and demand factors, leading to decisions that deviate from fundamentals. A typical example in 2024 was "anchoring to the number of Fed rate cuts rather than changes in actual interest rates": the Fed cut rates three times throughout the year, lowering the federal funds rate from 5.25%-5.50% to a relatively high level of 4.50%-4.75%, while actual interest rates did not decline significantly; however, investors, anchoring to the signal of "three rate cuts," generally expected gold prices to continue rising. Research shows that the price difference (or deviation) between domestic gold futures prices and international gold prices widened in April and May 2024, while some market analyses indicated that domestic gold production and consumption demand both increased during the same period, and fundamentals did not significantly support a sharp short-term price increase. This situation, where anchoring to specific information while ignoring overall fundamentals, increases market volatility and decision-making complexity. The phenomenon of "anchoring to the number of Fed rate cuts" observed in this study is a concentrated manifestation of investor sentiment under the impact of specific macroeconomic information. Research by Xiong Xiong et al., based on the stock index futures market, reveals that investor sentiment, as a systemic bias, significantly weakens the market's price discovery function [4]. Although Xiong Xiong et al. chose stock index futures as a typical example in their study, the interaction patterns they revealed among 'behavioral biases, market mechanisms, and market functions' have significant theoretical implications for the gold futures market. This indicates that specific cognitive biases, such as the anchoring effect, ultimately affect overall market sentiment, thereby interfering with the futures market's ability to effectively perform its core functions and exacerbating the deviation of prices from fundamentals.

4. The amplifying effect of market mechanisms and regulatory education on behavioral deviations

4.1. Market mechanism defects: exacerbating irrational volatility

Information related to gold futures is scattered across multiple platforms, resulting in high integration costs for investors and easily leading to herd behavior of "following others' decisions." For example, after the Federal Reserve "paused interest rate cuts" in June 2024, due to information confusion, individual investors rushed to close their positions in a short period. Simultaneously, the market lacks accessible interpretations of complex information. For instance, in March 2024, many individual investors focused solely on the "interest rate cut" conclusion while ignoring risk warnings, blindly following the crowd and incurring significant losses.

Furthermore, China's gold futures market implements a fixed price limit system and margin requirement, which may exacerbate investors' overreactions under extreme market conditions. For example, when international gold prices fluctuate sharply, fixed risk control measures may not be able to respond flexibly, forcing some investors to close their positions due to insufficient margin, thereby amplifying the volatility of domestic gold prices.

4.2. Lagging regulation and education:insufficient governance of behavioral bias

Current regulation focuses primarily on combating traditional violations, while attention to and monitoring tools for systemic risks arising from investor behavioral biases remain insufficient. For example, driven by events such as expectations of interest rate cuts, market herding behavior is significant, but regulators lack effective targeted indicators for early warning. The irrational operational risks inherent in newly listed instruments such as options also require greater attention.

Existing investor education largely focuses on basic knowledge and rule dissemination, failing to effectively integrate behavioral finance theory to provide targeted guidance against common cognitive biases. This results in only a small number of investors being able to fully understand and overcome their own behavioral biases, impacting the quality of their trading decisions.

5. Conclusion

This study points out that although the Chinese gold futures market experienced explosive growth in trading volume in 2024, significant investor behavioral biases (such as herding behavior, prospect theory bias, and anchoring effect) were observed. Market mechanism defects and lagging regulatory education further amplified irrational volatility. Optimizing the investor structure, improving market mechanisms, and constructing a behavior-oriented regulatory education system can effectively address these biases and promote healthy market development.

To mitigate market volatility caused by investor behavioral biases, the primary strategy is to optimize the investor structure. On the one hand, this involves expanding the participation of institutional investors, such as encouraging long-term funds like insurance funds and pension funds to increase their allocation to gold assets. After the implementation of the "Notice on Conducting Pilot Programs for Insurance Funds Investing in Gold" in early 2025, the current 1% investment ratio limit can be prudently assessed and gradually relaxed, while exploring diversified investment strategies. For gold production and consumption enterprises, a policy of "full exemption of hedging fees + risk compensation fund" should be implemented to reduce their hedging costs and risks, and improve operational stability. On the other hand, developing gold futures fund-of-funds (FOF) products, through specialized designs (such as management fee waivers for holdings of one year or automatic rebalancing triggered by a 7% maximum drawdown threshold), can guide individual investors to participate in the market indirectly through professional institutions, promoting long-term rational investment.

Market mechanism flaws can amplify behavioral biases, requiring solutions focusing on information transparency and rule flexibility. First, a one-stop information platform should be built, led by the Shanghai Futures Exchange, integrating data from the China Gold Association and the General Administration of Customs, adding a "Policy Interpretation Zone" and a "Behavioral Bias Case Library," and developing individual investor behavior diagnostic tools to help identify cognitive biases. Second, dynamic trading rules should be implemented: adjusting price limits based on the volatility of the previous five days and setting differentiated margin requirements according to investor type. Simultaneously, a tiered cooling-off period mechanism should be introduced; for example, a 15-minute cooling-off period (with fundamental alerts) is triggered when daily price fluctuations exceed 3%, and a 30-minute trading suspension and risk warning are triggered when fluctuations exceed 5%, to mitigate irrational volatility.

Regulation and education need to innovate from a behavioral finance perspective. At the macro level, a monthly "Gold Futures Market Behavior Deviation Index" (including indicators such as herding effect and prospect theory deviation) is released, and measures such as increasing margin

requirements or issuing risk warnings are taken when the threshold is exceeded. At the micro level, the Shanghai Futures Exchange has taken the lead in issuing the "Guidelines for Algorithmic Trading Behavior in Gold Futures," prohibiting algorithms that exacerbate herding effects and strengthening the supervision of financial self-media. In terms of education, tiered behavioral guidance is implemented: for individual investors, deviation identification is explained through "Typical Case Studies from 2024" (such as losses from following the crowd in March); for institutional investors, behavioral risk management training is held; and for enterprises, hedging and deviation avoidance workshops are organized. High gold price scenarios are set up using simulated trading platforms to establish investor behavior profiles and deliver targeted educational content.

This article integrates data from recent years, but due to the non-public nature of micro-level trading data, in-depth empirical evidence on behavioral deviations in each transaction is not conducted; This study also has limitations in predicting behavioral deviations under extreme scenarios—for example, the potential impact of the Federal Reserve's further interest rate cuts in 2025 or gold prices exceeding \$3,000/ounce. Future research could address this by constructing a scenario simulation model based on historical extreme market data. In the future, It is suggested that data authorization from the exchange should be applied for in future studies to conduct quantitative empirical research, or draw on the behavioral regulatory experience of Commodity Exchange gold futures to improve the countermeasures system for the Chinese market and provide more accurate support for investor decision-making in a highly volatile environment.

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