From Emotionally-Driven Frequent Decisions to Extreme Asset Allocation: The Mechanism Dissection and Integration Framework of Informationization's Impact on Irrational Investment Decisions

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Abstract: Digital technology has profoundly reshaped the information environment of the capital market.The changes in information supply, dissemination, and acquisition brought about by informatization have exerted multi-level and transmissive impacts on the decision-making logic of investorsfrom three aspects: information structure, cognitive mode, and behavioral choice.This article is based on core theories such as prospect theory in behavioral finance, regret aversion, cognitive dissonance, and herd behavior. It follows the sequential logic of "information shock - cognitive bias - behavioral alienation - configuration distortion", analyzing the cognitive biases caused by information overload.algorithmic cocooning, and immediate stimulation. It further explains the transmission path of investors' shift.from rational analysis to emotional dominance, from long-term investment to short-term speculation, and from balanced allocation to extreme choices. This study systematically expounds the internal transmission mechanism by which informatization influences investors' irrational decisions. It effectively addresses the limitations of existing research.which mostly focuses on a single dimension of analysis. Thus, it provides corresponding theoretical support and practical guidance for guiding investors to make rational decisions, preventing irrational fluctuations in the capital market, and maintaining the long-term stable and healthy operation of the market.

Keywords: Informationization, Irrational Decision-making, Cognitive Bias, Aberration of Investment Behavior, Distortion of Asset Allocation

1 Introduction

With the rapid development of digital technology and the increasing popularity of the Internet, the capital market has ushered in a new stage of development, and information has been more and more abundant, and the dissemination channels have been socialized, which has changed the way investors obtain information, changed the way they process information, and changed the way they filter information. The development of informatization has also caused challenges to the rational investment

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decision-making system.The study of behavioral finance shows that investors do not follow the principle of utility maximization when making decisions, and their cognition and behavior are inevitably affected by the information environment, which leads to systematic deviations.Informatization has led to information overload, which has a negative impact on the rationality and emotional sensitivity of investors, and their decisions have three prominent characteristics: extreme choices, emotional dominance, short-term speculation and so on.Most of the current studies only analyze the impact of a single information environment on investor behavior, and do not analyze the irrationality of investor behavior in depth, and do not clarify the logical chain of "information shock-cognitive bias-behavior alienation-allocation distortion", and do not analyze the transmission path of multi-stage transmission in an integrated way, and do not systematically reveal the mechanism of informatization transmission.

This paper takes the theory of behavioral finance as the basis, and focuses on the analysis of the information environment and the analysis of the process of informatization transformation.From the three aspects of acquisition, supply and dissemination, the capital market is analyzed, and the reasons why investors' cognitive bias will be caused are analyzed, so as to understand the impact of information technology on investors' irrational decisions, and to provide reference for the development of capital market and the rationality of investors' decisions.

2 Theoretical Foundation and Concept Definition

2.1 Theoretical Foundation of Behavioral Finance

Prospect Theory. Prospect Theory is the foundational theory of behavioral finance. It was formally proposed in 1979, breaking through the idealized assumptions of rational behavior in classical decision theory and making significant amendments and challenges to the rational person assumption in the traditional expected utility theory. [1]. This theory states that the core basis for investors' decisions is not the absolute value of final wealth, but the subjective reference point for defining gains and losses. As a result, investors exhibit risk aversion when facing gains and turn to risk seeking when facing losses [1].

Regret Aversion Theory. Regret aversion theory was first put forward in 1982, which can make up for the shortcomings of traditional finance theory, and can not only take into account the risks, but also pay attention to the emotional factors of investors, and make a reasonable decision in investment.In this theory, it is clearly pointed out that investors may not make the most reasonable decisions in order to avoid regret [2].In order to avoid locking in losses and deepen the feeling of regret, investors often hold assets for a long time, sell profitable assets in advance, and make decisions through herd behavior [2].

Cognitive Dissonance Theory. In 1957, the theory of cognitive dissonance was first put forward in the field of social psychology, and then introduced into the field of behavioral finance, which is conducive to the analysis of investment psychology [3].If the investor's judgment is inconsistent with the market trend, he will be in a state of psychological discomfort. At this time, the investor often refuses to admit the decision-making error and instead screens positive information, ignores negative news, and even increases investment to average down costs.in order to alleviate the psychological discomfort and ultimately exacerbate irrational holding and investment losses [3].

Herd Behavior Theory. Herd Behavior Theory describes typical herd behavior in financial markets. in the financial market. It refers to the situation where, in an environment of information asymmetry, investors abandon private information and independent judgment and blindly imitate the trading decisions of the majority of market participants or professional institutions [4]. Herd behavior leads to highly convergent consistent buying and selling behaviors among market participants, resulting in asset prices deviating from their intrinsic value, forming excessive reactions and irrational fluctuations in prices; significantly intensifying asset price fluctuations, giving rise to financial bubbles and extreme decline scenarios, and also being the key theory to explain the intense volatility and synchronous rise and fall of sectors in emerging financial markets [5].

Emotional Dominance. Emotional dominance refers to the decision-making pattern in investors' processes where they are influenced by irrational factors such as psychological feelings, market atmosphere, and herd mentality, deviating from objective information and rational calculations. Behavioral finance studies show that emotions can lead to phenomena such as return-chasing behavior, overreaction, and herd behavior and herd behavior, causing asset prices to deviate from intrinsic value, amplifying market volatility and bubble risks. The core lies in loss aversion, overconfidence, and other psychological biases, which are typical manifestations of bounded rationality [6].

Rational Analysis. Rational analysis denotes an investment decision-making process wherein investors systematically and logically evaluate public information, financial data, valuation models, and risk–return frameworks, while operating under constraints related to risk exposure and information availability. The objective of this approach is to maximize expected utility subject to these constraints.Classical financial theory assumes that investors possess complete rationality and information processing capabilities, can form unbiased expectations and execute optimal strategies [7]. In reality, rational analysis is manifested as fundamental analysis, quantitative model application, risk pricing, and diversification allocation, aiming to reduce the interference of emotions and market noise on decision-making.

Short-Term Speculation. Short-term speculation refers to investors ignoring the intrinsic value and long-term fundamentals of assets, with the core goal of short-term profit from price fluctuations. It involves high-frequency trading, frequent turnover, and simultaneously bearing higher volatility and greater risks through trading behaviors. It mainly relies on market trends, capital flows, technical signals, rather than the long-term value of the enterprise. In the eyes of the speculators, transaction costs, liquidity and volatility are the most critical, and they use leverage to get higher returns, although they can bring higher liquidity to the market, they will also cause irrational fluctuations in the short term, and the risk of tail is relatively high [8].

Long-Term Investment. Long-term investment should analyze the cash flow, value and other contents of enterprises, and the holding period should be more than one year, which requires the use of fundamental analysis method to obtain sustainable returns, and the time should be diversified.Long-term investors should analyze the development of enterprises from many aspects, including governance structure, industry development and so on, and will not be disturbed by market noise, which is consistent with the theory of efficient market hypothesis and value investment, and can avoid timing risk [9].

Extreme Choice. Extreme selection is a kind of behavior that investors do not have to make reasonable choices when allocating assets or formulating strategies, and the concentration is too high, which is reflected in the allocation of a single asset, the purchase of a single product, and the pursuit of short selling.It can not play the role of diversification and can not make dynamic adjustments.The root cause of this behavior is the cognitive bias of investors, which is reflected in the high concentration of the portfolio, the strong volatility, and the weak resistance, which can only get excess returns in a unidirectional market, but will have a significant drawdown when the market changes, and the stability of the investment portfolio is relatively poor [10].

Balanced Allocation. Balanced allocation is a configuration method that can be used in the process of risk management. It can play the role of multiple cycles, multiple strategies and multiple assets to achieve balance between risk and return, and pursue the goal of optimal balance.The core content is diversification and dynamic balance. According to the theory of modern portfolio, the volatility of the portfolio can be reduced without reducing the expected return, but the correlation between the assets is relatively low [11]. Balanced allocation requires moderate diversification, which can avoid extreme exposure and pursue long-term stable returns.

3 Literature Review

The existing research on informatization and investors' irrational decision-making mostly adopts a behavioral finance perspective, mainly conducting multi-dimensional discussions on aspects such as information environment characteristics, formation of

cognitive biases, investment behavior deviation, and asset allocation distortion. The massive and fragmented information environment is likely to cause attention fragmentation among investors and trigger underreaction to key signals [12], while the rapid dissemination of information through social media can lead to market sentiment contagion and trigger investors' herd trading [13].In terms of the derivation of cognitive biases, it has respectively explained the judgment bias caused by information overload and the amplification effect of confirmation bias in filter bubbles and short-term information stimulation also has a significant inhibitory effect on investors' rational decision-making ability [12,14,15]; In the study of investment behavior deviation, high-frequency trading often stems from the deviation caused by investors' excessive confidence, and this confidence will ultimately reduce investment returns in the long-term statistical sense. [16] The short-sighted loss aversion theory can explain the investors' disregard for long-term value [17], and emotional signals also have a direct substitution effect on fundamental analysis [18]; in the field of asset allocation distortion, investors generally have the problem of insufficient diversification [19, 20], and the substitution logic of short-term speculative assets for long-term allocated assets has been systematically explained, and the vicious cycle of extreme risk preference triggered by the success of short-term speculation has also been effectively revealed [21]. Overall, the existing research has covered many key nodes of the impact of information on investors' decisions, but has not yet formed a systematic integration framework for the transmission mechanism, and lacks the overall dissection of the logical chain among information shock, cognitive bias, behavioral alienation and allocation distortion.

4 Analysis of the Transmission Mechanism of Informationization on Investors' Irrational Decisions

Digital informatization reshapes the information environment of the capital market.generating three core impacts: information overload, algorithmic cocooning, and instant stimulation. Following a progressive logic of "information shock - cognitive bias - behavioral deviation - asset allocation distortion", it transmits from the decision-making logic, behavioral patterns to asset allocation, ultimately leading to the systematic distortion of investors' irrational decisions. Based on behavioral finance theory, this article analyzes the internal mechanism of this transmission path layer by layer.

4.1 Decision Logic Distortion: Emotional Dominance Replacing Rational Analysis

Informationization first acts on the information processing and cognitive judgment of investors, weakening the basis of rational analysis through instant stimulation, information overload, and algorithmic recommendations, shifting the decision-making logic from "objective calculation" to "emotion-driven", thus forming the cognitive basis of irrational decisions.

High-frequency Emotional-driven Decision Making. Digital media enables instant information dissemination.and stock price fluctuations and financial news create continuous instant stimulation. According to prospect theory, investors' nonlinear perception of loss makes short-term gains or losses trigger emotions such as greed or panic.Deviating from the fundamental analysis [12], investors are afraid of regret and take measures to avoid being trapped, and they make decisions in an emotional way, which weakens the rationality of investment [2].

Information Overload Leading to Cognitive Paralysis and Conformity Bias. In the process of informatization, the media can use algorithms to send information to retail investors, and investors will make extreme trading decisions under the guidance of emotion.

In the process of investment, if the information obtained by investors is too much and too fragmented, it will exceed their cognitive ability, resulting in information overload, which will lead to imbalance in the allocation of cognitive resources.In this case, investors will make wrong decisions, blindly follow others, and the market will fluctuate [14].Investors can not make decisions independently, but can only make decisions in groups to save cognitive costs, which is in line with the herd behavior theory [4].The existence of information asymmetry will enhance the herd effect, and the "information overload - cognitive failure - herd behavior" path will be formed, which will lead to irrational decisions.

Confirmation Bias Strengthened by Algorithm Recommendations. The algorithm recommendation system can summarize the historical preference data of a certain number of investors, construct an information cocoon, and push information to investors that is consistent with their cognition, which will lead to confirmation bias and information overload, and the confirmation bias of individual investors will be more and more serious [14].Information stimulation will lead to a decline in the rationality of investors' decision-making, resulting in a "self-validation" loop, and the imbalance between cognition and emotion will be more and more serious. Investors can only make decisions according to one-sided cognition, and the space for rational analysis is becoming smaller and smaller [15], and the logic of emotional decision-making is becoming more and more solid.

Informationization triggers emotional amplification, cognitive paralysis and confirmation bias at the cognitive level through three information shocks of instant stimulation, information overload and algorithm recommendations, ultimately leading to the decision logic of investors shifting from rational analysis to emotional dominance, laying the cognitive foundation for the subsequent behavioral pattern deviation. This deviation is the prerequisite and root cause for the subsequent behavioral pattern and asset allocation distortion, and is the first link in the transmission chain.

4.2 Behaviora Pattern Deviation: Short-Term Speculation Replacing Long-Term Investment

After investors' decision logic shifts from rationality to emotional dominance.it further transmits to the investment behavior level. Under the joint effect of transaction convenience, information fragmentation and socialized dissemination, investment behavior shifts from "long-term value holding" to "short-term speculation trading", forming the behavioral manifestation of irrational decisions. High-frequency trading often results from investors' overconfidence bias.and ultimately reduces investment returns.

High-Frequency Trading and Timing Instinct Intensified. Emotional decision-making combined with the convenience of mobile trading reduces the transaction threshold, stimulating timing instincts. Investors frequently engage in short-term trading, and high-frequency trading stems from overconfidence bias, frequent timing leads to a decline in returns [16]. The emergence of a large number of irrational trading orders in the market has intensified market volatility. These orders create pressure for coordinated trading behavior.pushing asset prices to deviate continuously from their intrinsic value, leading to excessive price reactions and unilateral trends. This, in turn, has exacerbated market volatility and replaced long-term investment behavior with short-term investment motives.

"Fragmented Memory" Leading to Short-Termism Bias. The fragmentation of information causes investors to develop "fragmented memory", focusing excessively on short-term market conditions while neglecting long-term value. According to the regret aversion theory in behavioral finance, investors tend to make choices that deviate from the optimal rationality to avoid the regret caused by decision-making errors [2]. Therefore, they are more sensitive to short-term losses, leading to the abandonment of long-term holding and the shift towards short-term speculation. Present biasfurther reinforces behavioral alienation.

Socialized Investment Leading to Blind Following. Social platforms tend to trigger the contagion effect of emotions, and individual investors are prone to individual investors are prone to blindly imitate the trading behavior of others The regret aversion theory states that investors often tend to make decisions through conformity to share the responsibility for regret, and through conformist trading to reduce the psychological burden caused by decision-making errors [2]. This mechanism will further give rise to the group characteristics of short-term speculation, causing investors to actively abandon private information and independent judgment and instead blindly imitate the trading decisions of the majority of market participants or professional institutions. This behavioral pattern is a typical manifestation of the herd behavior theory in behavioral finance [4]. Short-term speculation gradually evolves into a group behavior with consistent characteristics at the individual investor level due to the influence of multiple psychological and environmental factors.

Based on the decision-making logic dominated by emotions, the convenience of trading, the fragmentation of information, and socialized dissemination jointly drive investors' behavior patterns from long-term investment to short-term speculation. This distorttionis a direct external manifestation of cognitive biases, connecting the decision-making logic with asset allocation and forming the second link of the transmission chain.

4.3 Asset Allocation Alienation: Extreme Choices Replace Balanced Allocation

After the behavioral pattern shifts from long-term investment to short-term speculation, it ultimately propagates to the asset allocation stage. Under the influence of emotional fluctuations, cognitive biases, and market linkage, asset allocation shifts from "balanced dispersion" to "extreme concentration", resulting in irrational decision-making as the final outcome, and ultimately triggering irrational fluctuations in the capital market.

Polarization Distortion of Risk Preferences. Emotion-driven and short-term speculation lead to the polarization of investors' risk preferences: when prices rise, greed drives them to fully buy on the rise; when prices fall, panic drives them to completely sell out. This extreme choice stems from cognitive biases such as anchoring and confirmation bias and emotional amplification, manifested as high concentration of the portfolio, high volatility, and vulnerability. Although it may achieve excess returns in a unilateral market, it is prone to significant drawdowns when the market reverses, reducing the stability of the investment portfolio [10]. Ignoring the principle of diversification and violating the logic of balanced allocation. The balanced allocation of assets shifts to extreme choices.

Irrational Blind Pursuit or Over-Exclusion of Financial Innovation Products. In the digital information environment, investors are prone to generate biased learning from noise signals and develop excessive confidence, which in turn leads to frequent trading and extreme asset allocation behaviors. At the same time, information asymmetry and cognitive biases jointly cause investors to exhibit polarized attitudes towards financial innovation products: driven by short-term return effects. Some investors blindly pursue high-risk products; while another group, due to cognitive limitations, excessively rejects high-quality financial innovation products. [21]. This irrational attitude and the blind pursuit or over-exclusion of innovative products replace the balanced allocation logic. The allocation deviates from the risk-return balance, further reinforcing the extreme tendency. The irrational attitude towards innovative products replaces the balanced allocation principle with short-term emotions and one-sided cognition.

Irrational Transmission of Cross-Market Volatility. Informationization breaks the boundaries of the market, and the rapid dissemination of information will to some extent strengthen the effect of emotional resonance, thereby triggering cross-market emotional linkage. Investors' cognitive biases and emotional fluctuations further

amplify this linkage, leading to cross-market irrational transmission. The extreme adjustment of assets in other markets triggered by fluctuations in the single market will to some extent undermine the stability of balanced allocation and further amplify systemic risks. The irrational transmission across markets extends the increasing extremityof allocation from a single market to multiple markets, ultimately leading to distortion.

Under the influence of short-term speculative behavior patterns, asset allocation gradually shifts toward extreme concentration.the combined effects of emotional fluctuations, cognitive biases, and market interconnections drive individual investors' asset allocation to shift from balanced dispersion to extreme concentration. This alienation is the ultimate destination of cognitive biases and behavioral alienation, forming the third link in the transmission chain and also the direct cause of irrational fluctuations in the capital market.

5 Conclusion

Based on the core theories of behavioral finance, this paper follows the logical sequence of "information shock - cognitive bias - behavioral alienation - asset allocation distortion", systematically exploring the transmission mechanism and alienation manifestations of informatization on investors' irrational investment decisions. The research shows that the information overload, algorithmic cocoon, and immediate information stimulation brought by informatization gradually weaken the rational decision-making foundation of individual investors by amplifying psychological biases such as prospect theory, regret aversion, cognitive dissonance, and herd behavior. Firstly, it triggers a shift from rational analysis to high-frequency emotion-drivendecision-making, then promotes investment behavior to deviate from long-term investment to short-term speculation, and ultimately leads to an extreme concentration of asset allocation, forming a complete irrational decision-making transmission loop.

This study constructs an integrated analysis framework for the impact of informatization on irrational investment decisions, compensating for the fragmentation and singularity of existing research, and revealing the mechanism of the role of digital information environment in investors' decision-making behavior. The research conclusions enrich the theoretical connotation of the intersection of behavioral finance and digital finance, and can provide theoretical references for regulatory authorities to regulate information dissemination order, manage market irrational fluctuations, and build a scenario-based and regularized investor education system. It also helps individual investors identify cognitive biases, rationally avoid behavioral alienation, and optimize investment decisions. In the future, heterogeneity analysis can be further conducted from the perspectives of investors' experience, risk preferences, and information acquisition channels, and empirical models can be combined to test the marginal effect of informatization in different regulatory environments and market conditions. The theoretical framework of investor decision-making from the perspective of digital finance.will be continuously improved.

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