

A UNIFIED THEORETICAL FRAMEWORK OF COGNITIVE BIASES AND MARKET ANOMALIES IN BEHAVIORAL FINANCE

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ABSTRACT

Traditional finance theory assumes that investors are rational agents who maximize expected utility and process information efficiently. However, persistent market anomalies and systematic deviations from rational behavior challenge these assumptions. Behavioral finance emerged as an interdisciplinary field integrating psychology and economics to explain how cognitive biases influence investment decisions and contribute to market inefficiencies. This paper develops a unified theoretical framework that links cognitive biases at the individual level to market anomalies at the aggregate level. The framework demonstrates how heuristic-driven decision-making, emotional

influences, and social interactions collectively shape financial markets. By integrating prospect theory, bounded rationality, and adaptive market dynamics, the study provides a comprehensive explanation of anomalies such as momentum effects, excess volatility, market bubbles, and equity premium puzzles. The framework contributes to behavioral finance literature by offering a holistic perspective that connects micro-level psychological processes with macro-level market outcomes.

Key words: Behavioral finance, cognitive biases, market anomalies, prospect theory, bounded rationality, investor behavior.

INTRODUCTION

Classical financial theories such as the Efficient Market Hypothesis (EMH) and Modern Portfolio Theory (MPT) assume that investors are rational and markets efficiently incorporate all available information. According to the EMH, security prices always reflect intrinsic values because investors process information objectively and act to maximize utility (Fama, 1970).

Despite the elegance of these models, empirical evidence reveals persistent anomalies that cannot be adequately explained by rational-agent frameworks. Phenomena such as stock market bubbles, momentum effects, excessive trading, and investor overreaction suggest that psychological factors play a significant role in financial decision-making (Shiller, 2003).

Behavioral finance addresses these limitations by incorporating insights from psychology into economic models. Seminal contributions by Daniel Kahneman and Amos Tversky demonstrated that individuals systematically deviate from rationality due to cognitive biases and heuristics (Kahneman & Tversky, 1979).

This paper proposes a unified theoretical framework that explains how cognitive biases generate market anomalies through individual and collective investor behavior.

THEORETICAL FOUNDATIONS

Bounded Rationality

The concept of bounded rationality, introduced by Herbert Simon, argues that individuals face cognitive limitations that prevent optimal decision-making. Instead of maximizing utility, investors often satisfice by selecting options that appear sufficiently satisfactory given available information (Simon, 1955).

Bounded rationality suggests that investors rely on simplified decision rules when confronted with uncertainty, complexity, and time constraints.

The Implications of this theory include: Limited information processing, reliance on heuristics, incomplete optimization and susceptibility to cognitive errors.

Prospect Theory

Prospect Theory provides one of the most influential explanations for investor behavior. According to Kahneman and Tversky (1979), individuals evaluate gains and losses relative to a reference point rather than absolute wealth levels. The Key principles include: Loss aversion meaning investors experience losses more intensely than equivalent gains. Diminishing sensitivity implying the subjective impact of gains and losses decreases as magnitude increases. Probability weighting meaning individuals' overweight small probabilities and underweight large probabilities.

These characteristics explain why investors often: hold losing stocks too long, sell winning stocks prematurely, avoid risks during gains and seek risks during losses.

Adaptive Markets Hypothesis

The Andrew Lo proposed the Adaptive Markets Hypothesis (AMH), which combines market efficiency with evolutionary principles (Lo, 2004). The AMH suggests that: Investor behavior evolves over time, market efficiency varies across environments, competition and adaptation shape investment strategies and anomalies emerge and disappear depending on market conditions. This perspective bridges traditional and behavioral finance by acknowledging both rational adaptation and psychological influences.

COGNITIVE BIASES AS DRIVERS OF FINANCIAL BEHAVIOR

The proposed framework identifies three major categories of biases.

Heuristic-Based Biases

Overconfidence Bias

Investors overestimate their knowledge and predictive abilities.

Consequences include: Excessive trading, under-diversification and Increased risk-taking.

Research shows that overconfident investors trade more frequently and often achieves lower net returns (Barber & Odean, 2001).

Representativeness Bias

Investors judge future outcomes based on recent patterns. For example, extrapolating recent stock performance and believing "hot stocks" will continue outperforming. This bias contributes to momentum effects and speculative bubbles.

Availability Bias

Investment decisions are influenced by easily recalled information. For example, media coverage, recent market events and personal experiences. This often results in overreaction to news.

Emotional Biases

Loss Aversion

Investors avoid realizing losses even when doing so is economically optimal.

Regret Aversion

Investors avoid decisions that might generate future regret.

Endowment Effect

Individuals assign greater value to assets they already own.

These biases contribute significantly to market inefficiencies and suboptimal portfolio management.

Social Biases

Herding Behavior

Investors imitate others rather than relying on independent analysis. Herding can create: Asset bubbles, market crashes and excessive volatility.

Confirmation Bias

Investors seek information that confirms existing beliefs while ignoring contradictory evidence. This reinforces mispricing and delays market corrections.

Unified Theoretical Framework

The proposed framework consists of four interconnected stages:

Stage 1: Information Processing

This unified theoretical framework integrates the principal theories of behavioral finance into a sequential process that explains how individual psychological factors influence financial markets. The framework proposes that financial decision-making begins with the acquisition and interpretation of investor information. However, because investors possess limited cognitive capacity and incomplete information, their decisions are constrained by bounded rationality (Simon, 1955). Rather than processing all available information optimally, investors simplify complex decisions through the use of heuristics.

Stage 2: Cognitive and Emotional Filtering

Heuristics are cognitive shortcuts that enable individuals to make judgments under uncertainty. While they reduce the complexity of decision-making, they also increase susceptibility to systematic errors. Common heuristics include representativeness, availability, and anchoring, which often produce predictable cognitive biases (Tversky & Kahneman, 1974). These biases distort investors' perceptions of risk, expected returns, and probabilities, leading to deviations from rational investment behavior.

The framework further posits that cognitive biases interact with emotional responses, particularly fear, greed, and regret. Emotions intensify the influence of biases by affecting investors' tolerance for risk and their reactions to market events. For example, fear may encourage panic selling during market downturns, whereas greed may promote speculative investment during bull markets. Regret may discourage investors from realizing losses, contributing to the disposition effect (Kahneman & Tversky, 1979).

Stage 3: Behavioral Decision-Making

These psychological influences shape investor decisions, including whether to buy, hold, or sell financial assets. Since many investors exhibit similar biases simultaneously, individual decisions aggregate into collective investor behavior, commonly observed as herding, excessive optimism, or excessive pessimism. Collective behavioral patterns generate market anomalies, including momentum, excess volatility, asset bubbles, post-earnings announcement drift, and market crashes, which contradict predictions of the Efficient Market Hypothesis (Barberis & Thaler, 2003).

Stage 4: Aggregate Market Outcomes

When biases affect large numbers of investors simultaneously, market anomalies emerge: Although rational arbitrageurs may recognize these pricing inefficiencies, the Limits to Arbitrage Theory suggests that transaction costs, funding constraints, short-selling restrictions, and noise trader risk prevent them from immediately correcting market mispricing (Shleifer & Vishny, 1997). Consequently, behavioral distortions persist, resulting in persistent mispricing, where asset prices remain above or below their intrinsic values for extended periods.

Overall, the framework demonstrates that financial markets are influenced not only by economic fundamentals but also by psychological and emotional factors. It provides a comprehensive explanation of how individual cognitive limitations evolve into market-wide inefficiencies and offers an integrated theoretical foundation for research examining investor behavior and financial market anomalies.

Theoretical Propositions

The framework implies the following propositions:

- i. Investors process financial information under conditions of bounded rationality.
- ii. Bounded rationality increases reliance on heuristics in investment decision-making.
- iii. Heuristics generate systematic cognitive biases that influence investor judgments.
- iv. Cognitive biases interact with emotions such as fear, greed, and regret to shape investment decisions.
- v. Individual investment decisions aggregate into collective market behavior.
- vi. Collective investor behavior gives rise to persistent market anomalies.
- vii. Limits to arbitrage prevent rational traders from fully eliminating market inefficiencies.
- viii. Persistent market anomalies result in prolonged deviations of asset prices from their fundamental values.

MAJOR MARKET ANOMALIES

Momentum Effect

Momentum refers to the tendency of winning stocks to continue outperforming and losing stocks to continue underperforming.

Behavioral explanations include: Representativeness bias, investor underreaction and herding behavior. These factors delay information incorporation into prices.

Excess Volatility

Market prices often fluctuate more than justified by changes in fundamental values.

Behavioral drivers include: Overconfidence, availability bias and emotional reactions. These factors amplify trading activity and price movements.

Asset Price Bubbles

Bubbles occur when prices significantly exceed intrinsic values.

Behavioral mechanisms include: Herding, overconfidence, confirmation bias.

Historical examples include: Dot-com Bubble and Global Financial Crisis

Equity Premium Puzzle

The equity premium puzzle refers to the unusually high historical returns on equities relative to risk-free assets. Behavioral explanations emphasize: Loss aversion, ambiguity aversion and

probability weighting. These factors increase perceived risk and affect portfolio allocation decisions.

IMPLICATIONS FOR FINANCIAL THEORY AND PRACTICE

The unified framework has several implications:

For Investors

- i. Recognize and mitigate personal cognitive biases.
- ii. Adopt disciplined investment strategies.
- iii. Improve portfolio diversification.
- iv. Avoid emotional trading.

For Fund Managers

- i. Incorporate behavioral indicators into risk management.
- ii. Monitor investor sentiment.
- iii. Reduce behavioral errors through structured decision-making.

For Regulators

- i. Enhance market transparency.
- ii. Improve financial literacy.
- iii. Monitor speculative bubbles and systemic risks.

For Researchers

- i. Develop integrated behavioral asset-pricing models.
- ii. Examine interactions among multiple cognitive biases.
- iii. Explore behavioral finance across different cultural and institutional contexts.

CONCLUSION

Behavioral finance provides a comprehensive explanation for why financial markets often deviate from the predictions of classical finance. Rather than treating cognitive biases and market anomalies as separate phenomena, the unified theoretical framework demonstrates that psychological biases influence investor behavior, which collectively produces persistent market anomalies such as momentum, excess volatility, speculative bubbles, and post-earnings announcement drift. Integrating Prospect Theory, bounded rationality, and heuristic decision-making into a single framework offers a richer understanding of financial markets and highlights the importance of psychological factors in investment decision-making. Future research should focus on quantifying the interaction among multiple biases and incorporating behavioral variables into predictive asset-pricing models.

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