

Group Behavior and Systemic Risk in Financial Markets: A Behavioral Finance Perspective on Crisis-Preceding and Post-Crisis Effects

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Abstract. This study analyzes the effects of collective investor behavior on systemic risk in financial markets using principles from behavioral finance. The research investigates how investor sentiment and emotional reactions together with herding behavior affect market instability during different stages of financial crises. Data analysis from the 2007-2009 Global Financial Crisis (GFC) lets us investigate the effect of irrational investor behavior on market volatility and systemic risk. The study analyzes important financial indicators such as stock market returns and volatility indices along with credit default swap spreads which are compared with sentiment data gathered from social media networks. Investor herd actions combined with overreactions to news events create market instability because stock market behavior moves away from economic fundamentals according to our analysis. This research advances understanding of how collective actions of investors create irrational market patterns and worsen financial crises. The study suggests ways to manage systemic risk with regulatory policies that include behavioral insights within financial regulation structures.

Keywords: behavioral finance, herd behavior, systemic risk, investor sentiment, global financial crisis

1. Introduction

According to traditional finance scholarship financial markets function as completely efficient entities because rational investor activity causes market prices to reflect all available information. Traditional finance theory depends on the Efficient Market Hypothesis (EMH) which asserts markets function at peak efficiency. The sequence of financial crises including the 2007-2009 Global Financial Crisis showed market operations are often driven by irrational forces as opposed to pure rational decision-making. Investor behavior affected by cognitive biases and emotional influences produces market inefficiencies that lead to financial instability and crises. The research investigates how collective phenomena such as herd dynamics and emotional spread contribute to systemic risks that undermine financial market stability. Investor decisions typically show irrational patterns according to behavioral finance research. Financial decision-making processes are systematically disrupted by cognitive biases including overconfidence and loss aversion as well as anchoring effects. Overconfidence makes investors pursue excessive risks whereas loss aversion results in them retaining depreciating assets beyond ideal times. These biases create market distortions like asset bubbles which result in prices being determined by investor sentiment instead of true economic fundamentals. Market movements become more extreme when emotional contagion spreads fear or greed among groups of investors. Market uncertainty makes herd behavior in behavioral finance especially important. Investors frequently mirror the decisions of their peers despite conflicts with their independent market analyses. Financial crises create an environment where market panic and fear dominate investor behavior. Market crashes deepen when collective investor actions lead to increased price fluctuations [1]. The study seeks to analyze how collective actions lead to systemic risk while developing policy suggestions to enhance market stability. This paper examines behavioral influences in market operations to suggest ways financial regulation can adapt to address common investor irrationalities.

2. Literature Review

2.1. Theoretical Foundations of Behavioral Finance

Behavioral finance developed as an alternative perspective that contests traditional economic models which assume rational decision-making processes by individuals. The Efficient Market Hypothesis (EMH) within traditional finance models states that market prices incorporate every piece of available information while investors make rational choices. Behavioral finance opposes traditional views by highlighting psychological influences on financial decision-making. The analysis acknowledges that investor behavior deviates from rationality because of cognitive biases like overconfidence, loss aversion, and anchoring [2]. Investors who suffer from overconfidence biases typically misjudge their market prediction abilities which drives them to take too much risk and generate market instability. Loss aversion describes the behavior of investors who hesitate to sell depreciating assets and hold onto them beyond the optimal time which can postpone necessary market corrections. Systemic risks emerge from the aggregation of irrational investor behaviors across large groups and these risks disrupt market stability which ultimately leads to financial crises. Behavioral finance theories demonstrate how emotional responses like fear and greed can worsen irrational financial behavior and create extreme market volatility. The research has dramatically transformed our comprehension of market operations and how collective investor actions create financial risks [3].

2.2. Herding Behavior and Its Impact on Financial Crises

Herding behavior describes how people tend to copy the actions of larger groups without performing a critical analysis of the logic behind those actions. The tendency for individuals to imitate others' decisions intensifies during uncertain market periods because people act based on fear or social conformity. Financial markets can experience bubbles through herding behavior as asset prices increase beyond their true worth before crashing down when the bubble bursts. Financial crises such as stock market crashes and impending financial meltdowns trigger this behavior most frequently. Herding behavior triggers increased volatility and systemic risk because investors tend to follow collective emotional responses rather than fundamental market analysis. Throughout financial history numerous examples demonstrate how widespread panic triggers cascading effects that intensify market downturns [4]. The nature of financial crises becomes evident when individual decision-making mistakes combine through herding behavior to create extensive market breakdowns. Simultaneous reactions by large numbers of investors to rumors or news trigger extreme market movements which elevate the risk of a financial meltdown.

2.3. Crisis Preceding and Post-Crisis Effects of Group Behavior

Group behavior in financial markets extends beyond crisis periods since its implications remain significant both before and after these events. During the time before a crisis emerges collective behavior leads investors to display excessive optimism which results in speculative investments that push asset prices to unsustainable levels. Herd behavior creates investor overconfidence which inflates market bubbles until they burst and trigger financial crises. The post-crisis period triggers panic and risk-avoidance among investors who abandon risky assets which creates drastic market price drops. Following economic crises individuals exhibit emotional responses to fear and uncertainty which override logical decision-making processes [5]. Fear-based actions delay crisis recovery because they prevent investors from re-entering markets necessary for economic stimulation. Analyzing group behavior patterns throughout all crisis phases reveals psychological factors that both initiate and perpetuate financial instability. The patterns of collective action demonstrate how market psychology operates in cycles while highlighting the need to evaluate behavioral factors during systemic risk assessments in financial markets.

3. Methodology

3.1. Data Collection and Financial Market Indicators

The research examines systemic risk influence by group behavior through data from the 2007-2009 Global Financial Crisis and subsequent events. This research employs three main financial indicators which consist of stock market returns together with volatility indices (VIX) and credit default swap (CDS) spreads. Market instability and investor behavior can be effectively assessed through these financial indicators. The performance of stock markets can be evaluated through their returns while the VIX functions as a standard gauge for market volatility which mirrors the level of investor anxiety and doubt. Credit default swap spreads function as indicators of both credit risk and market stress because they represent the insurance costs against default risk in financial markets. The analysis of investor sentiment incorporates sentiment indices and information from social media networks such as Twitter and Reddit among other market indicators. These sources deliver real-time displays of market responses and collective investor sentiments [6]. We can study how collective market behavior during times of financial distress increases systemic risk by tracking changes in sentiment. Our study analyzes financial data from both U.S. and European markets to provide a global view on the differences in market behavior between various economies. The summary of financial indicators used in our

analysis is shown in Table 1 and Table 2 lists the investor sentiment indices and social media platforms that were examined for sentiment analysis.

Table 1. Financial Market Indicators Used in the Study

Indicator	Description	Source	Time Period
Stock Market Returns	Daily percentage changes in major stock indices	Bloomberg, Yahoo Finance	2007-2009 (GFC Period)
Volatility Index (VIX)	Measures market volatility and investor fear	CBOE	2007-2009, 2009-2015
Credit Default Swap Spreads	Reflects perceived credit risk and market stress	Markit, Reuters	2007-2009 (GFC Period)

3.2. Sentiment Analysis and Social Media Data

During periods of increased uncertainty market dynamics are heavily influenced by investor sentiment. The research applies natural language processing (NLP) tools for sentiment analysis on data obtained from social media platforms like Twitter and Reddit. Real-time data streaming from investment platforms helps to understand investor responses to market events which proves useful in discovering collective behavior trends. Sentiment indices are built through the examination of keyword frequencies along with topic modeling techniques and the polarity of user-generated content. Our research extends beyond sentiment analysis to include examination of historical sentiment changes through data extracted from investor forums as well as financial news websites. The data from these sources reflects investor expectations and market mood which have the power to influence financial decisions and affect market stability [7]. This study's Table 2 displays both the sentiment indices used and the analyzed platforms.

Table 2. Sentiment Indices and Platforms Analyzed

Sentiment Source	Description	Platform	Time Period
Social Media Sentiment	Analyzes public opinion from Twitter and Reddit posts	Twitter, Reddit	2007-2009, 2009-2015
Financial News Sentiment	Analyzes tone and polarity of financial news articles	Financial Times, Bloomberg	2007-2009 (GFC Period)
Investor Forum Sentiment	Captures sentiment from online investor discussions	Motley Fool, Seeking Alpha	2007-2009, 2009-2015

3.3. Experimental Design: Mixed-Methods Approach

Researchers used a mixed-methods approach which integrates quantitative financial analysis with qualitative sentiment analysis to investigate the link between group behavior and systemic risk. The quantitative research element uses regression models to establish a link between herd behavior dynamics and fluctuations in market volatility. The research examines the role of herd behavior as correlated movements across asset classes in increasing market volatility during periods of crisis. The research team calculated correlation coefficients between major asset classes such as stocks, bonds and commodities to observe herd behavior in the timeframe around the 2008 financial crisis. When high correlations exist between markets it suggests herd behavior because investors across various markets move together despite the fundamental values. During times of low correlation markets move based on the fundamentals of individual assets. Sentiment analysis of social media posts and financial news articles comprises the qualitative aspect which uses NLP methods to evaluate tone and emotional content [8]. A sentiment index is built from aggregated sentiment scores which researchers analyze alongside market volatility and asset returns to study the links between collective investor emotions and systemic market risks. The mixed-methods design provides a complete perspective on the influence of collective rational and irrational behavior on financial market results during crisis periods.

4. Experiment Process

4.1. Pre-Crisis Data Analysis

The research investigates market patterns and investor sentiment that developed before the 2008 Global Financial Crisis (GFC) broke out. The data shows that herd mentality dominated investor behavior before the financial crisis as excessive optimism persisted in high-risk markets like housing and finance. Table 3 displays stock market return data from 2006 to 2008 revealing a significant asset price rise with the housing market being notably overpriced compared to historical fundamentals. The period of

overvaluation aligned with rising investor sentiment as measured by sentiment indices presented in Table 3 [9]. The relationship between rising asset prices and sentiment indices demonstrates that investor confidence significantly drove price inflation which resulted in market valuations that were not aligned with economic fundamentals. The period's economic indicators and stock market returns showed a troubling split according to the collected data. During the period when asset prices reached new highs key economic indicators declined with housing affordability and consumer confidence facing deterioration which underscored the impact of irrational behavior in creating asset bubbles.

Table 3. Stock market returns and investor sentiment indices leading up to the 2008 crisis.

Year	Housing Sector Return (%)	Investor Sentiment Index (0-100)
2006	12.4	75
2007	14.8	85
2008	-20.3	45

4.2. Crisis Period Analysis

The research shows that during the 2008 crisis asset prices experienced significant volatility and extreme price fluctuations. When investors started feeling negative about the market the reaction to bad news led to a noticeable overreaction. After Lehman Brothers went bankrupt in September 2008 markets panicked which led to vast asset sell-offs and severe price drops. The data presented in Table 4 demonstrates how market volatility increased during this time frame especially within credit markets as CDS spreads expanded significantly when investors tried to protect themselves from growing default risks. Sentiment analysis from social media platforms during the crisis showed an increase in panic-driven posts which supports the theory that market dynamics are impacted by collective fear [10]. According to regression models extreme herding behavior which manifests as both panic-driven social media posts and significant rises in volatility indices demonstrates a close correlation with stock price declines. During high-stress periods the analysis identified a significant rise in market systemic risk because investors abandoned risk assets en masse which intensified the crisis.

Table 4. Volatility index, CDS spreads, and panic index during the 2008 financial crisis.

Date	VIX (Volatility Index)	CDS Spreads (bps)	Investor Panic Index (0-100)
15 Sep 2008	46.9	350	95
1 Oct 2008	60.5	400	98
1 Dec 2008	80.0	500	100

4.3. Post-Crisis Data Analysis

The research examines the recovery period after the crisis to determine how investor behavior changed. The recovery period started with a distinct overreaction where investors showed extreme risk aversion. The post-2008 period displayed high market volatility which persisted even as economic fundamentals showed signs of improvement. Sentiment indices remained at low levels because of persistent fear throughout the market while many sectors showed gradual yet careful stock price recovery. According to the study's regression models markets moved toward rational pricing over time yet herding behavior persisted in influencing market trends especially within sectors hit hardest by the crisis like housing and banking. Although markets eventually stabilized markets were still influenced by herd behavior patterns established during the financial crisis.

5. Conclusion

This research demonstrates how collective behavior alongside cognitive biases generate and intensify systemic risks in financial markets. Research into the 2007-2009 Global Financial Crisis shows market instability was driven by investor sentiment and collective behavioral patterns such as herd movements and emotional contagion. Before the financial crisis hit, excessive optimism combined with investor overconfidence resulted in inflated asset values especially in sectors such as housing and finance that carried higher risks. Market panic and fear dominated during the crisis as investors overreacted to bad news which increased market volatility. The post-crisis era showed that herd behavior along with emotional reactions continue to exist which slows down market recovery and extends economic unpredictability. The research paper adds to behavioral finance studies by showing that mental and emotional elements lead to market inefficiencies and systemic risks. The research results show that by integrating behavioral insights into financial regulation we can achieve more effective management of market instability. Market irrationality effects could be diminished by implementing policies that enforce transparency while reducing information asymmetry together

with measures to tackle investor biases. Future research should investigate ways educational programs for investors and better decision-making models can decrease harmful biases and create more stable financial markets.

Contribution

Zhangyu Wang and Bowen Hu contributed equally to this paper.

References

- [1] Risman, A., et al. (2022). The behavioral finance of MSMEs in the advancement of financial inclusion and financial technology (Fintech). *Journal of Economics, Finance and Accounting*, 91-101.
- [2] Vasileiou, E. (2022). Behavioral finance and market efficiency in the time of the COVID-19 pandemic: does fear drive the market?. In *The Political Economy of Covid-19* (pp. 116-133). Routledge.
- [3] Chkioua, D. H. (2021). Excess Volatility in the Tunisian Stock Market: Explanation by Behavioral Finance. *South Asian Journal of Social Studies and Economics*, 12, 1-11.
- [4] Khan, A., et al. (2022). A bibliometric review of finance bibliometric papers. *Finance Research Letters*, 47, 102520.
- [5] Anggraeni, T., et al. (2021). Pengaruh Behavioral Finance Terhadap Pengambilan Keputusan Hutang di Era Covid-19: Studi Kasus Pada UMKM Sektor Makanan di Kota Bandung. *Jurnal Sains Sosio Humaniora*, 5(2), 1095-1108.
- [6] Choijil, E., et al. (2022). Thirty years of herd behavior in financial markets: A bibliometric analysis. *Research in International Business and Finance*, 59, 101506.
- [7] Aydin, Ü., Ağan, B., & Aydin, Ö. (2021). Herd behavior in crypto asset market and effect of financial information on herd behavior. *arXiv preprint arXiv:2104.00763*.
- [8] Wen, C., Yang, Z., & Jiang, R. (2022). Herding behavior in Hong Kong stock market during the COVID-19 period: a systematic detection approach. *Journal of Chinese Economic and Business Studies*, 20(2), 159-170.
- [9] Ah Mand, A., et al. (2023). Herding behavior and stock market conditions. *PSU Research Review*, 7(2), 105-116.
- [10] Ali, M., Amir, H., & Shamsi, A. (2021). Consumer herding behavior in online buying: A literature review. *International Review of Management and Business Research*, 10(1), 345-360.