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Market Volatility: A Cross-Event Comparison Based on Availability Heuristic, Uncertainty Aversion, and Loss Aversion

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Abstract. With the continuous development of society, the global economy has shown an overall upward trend. Nevertheless, it is undeniable that various external shocks continue to impact international financial markets. Therefore, this study, from the perspective of behavioral finance, delves into global shocks, specifically natural disasters, geopolitical conflicts, and global health crises, to investigate how such shocks affect investor sentiment and stock market volatility. In behavioral finance, emotional reactions, psychological biases, and attention shifts can significantly influence market dynamics during periods of uncertainty. Drawing on relevant research concerning natural disasters, geopolitical conflicts, and public health crises, this paper finds that global shocks affect investor sentiment, thereby leading to non-fundamental asset demand and intensifying market volatility. The fear, loss aversion, and attention bias triggered by global shocks jointly drive market anomalies. Therefore, strengthening research on how investors' irrational emotional transmission channels affect the market is essential, as this study provides insights into market behavior during crises and holds significant implications for investors, policymakers, and regulators in stabilizing the market during such periods.

Keywords: External Shocks, Stock Market Volatility, Availability Heuristic, Uncertainty Aversion, Loss Aversion

1. Introduction

Global financial markets continue to receive unpredictable shocks, including but not limited to natural disasters, geopolitical conflicts, and global health crises. Reality repeatedly proves that traditional financial theory—especially the Efficient Market Hypothesis (EMH), which posits that prices fully reflect all available information and investors act rationally—often fails under the influence of global shocks [1], because global shocks often trigger investors' emotional and psychological reactions.

Behavioral finance fills this theoretical gap by emphasizing the role of cognitive biases, emotions, and investor sentiment in financial decision-making. When uncertainty and fear dominate, investor sentiment becomes a crucial driver of price volatility [1], often leading to overreactions, panic selling, or speculative bubbles. Global shocks frequently cause a massive shift in confidence

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and attention [2]. Therefore, these conditions represent an ideal scenario for observing such behavioral patterns: when uncertainty surges, investors' rational judgment ability declines, and emotion-driven decisions dominate market behavior.

This paper aims to systematically study how global shocks affect investor sentiment and subsequently intensify stock market volatility. We have selected three highly representative global shocks as evidence: natural disasters [3] to investigate the availability heuristic; geopolitical conflicts [4] to explore uncertainty aversion; and global public health crises [5] to examine loss aversion. Focusing on these three categories of psychological mechanisms, this paper further investigates the deep-seated origins of financial instability. Section 2 introduces the research methodology, Section 3 presents the results on behavioral mechanisms based on literature analysis, and Section 4 provides the interpretation, discussion, and conclusion of the relevant findings.

On this basis, the cross-event comparative perspective adopted by this paper also enhances the theoretical and practical significance of the study. By examining three distinct global shocks within a unified behavioral framework, this paper reveals how different crises can trigger similar market reaction patterns through the investor sentiment channel. This not only deepens the understanding of the sentiment-driven volatility mechanism but also provides valuable references for establishing early crisis warning indicators, refining risk management tools, and assisting policymakers in stabilizing the market.

2. Literature review

2.1. Theoretical foundations of behavioral finance: rational assumptions and biases

Traditional finance is centered on the Efficient Market Hypothesis (EMH). However, the real market exhibits "market anomalies" such as herding behavior, indicating the limitations of traditional finance in explaining crisis-driven market anomalies. Behavioral finance, by introducing psychological concepts, reveals systemic errors and emotional reactions in investors under uncertain environments.

Heuristics and Availability Bias. Investors often rely on simplified rules of thumb rather than systematic analysis for decision-making, leading to errors in probability estimation. Heuristics and availability bias refer to investors' tendency to make decisions based on simplified rules of thumb or on information that is vivid, recent, or easily recalled. Instead of conducting systematic analysis, investors may rely on such easily accessible cues, which increases the likelihood of probability misjudgment and biased estimations.

Uncertainty Aversion. Ambiguity aversion describes the behavior of investors who are more inclined to avoid situations involving vague or unquantifiable risks. When the probability or the magnitude of a risk is unclear, investors typically opt to refrain from undertaking such uncertainty, even if the expected returns of the risky asset are higher. This behavioral tendency explains why the market's willingness to bear risk rapidly declines in the face of ambiguous shocks.

Loss Aversion. Loss aversion is embodied by the psychological response of investors to losses being significantly stronger than their positive experience from gains of an equivalent magnitude. Because the psychological pain derived from a loss outweighs the pleasure derived from a gain, negative shocks tend to have a more intense and asymmetrical impact on market behavior, consequently making it one of the crucial mechanisms for market volatility asymmetry.

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2.2. Comparison of behavioral mechanisms across three sudden external shocks

2.2.1. Natural disasters and the availability heuristic

Natural disasters (such as hurricanes and earthquakes) are characterized by suddenness, unpredictability, and strong visual impact. These characteristics often quickly capture public attention and become the focus of media reporting, thereby triggering widespread social concern. Studies show that after a disaster, investor search attention related to environmental risks rapidly increases, and this attention shift is not entirely rational [3].

The core behavioral mechanism here is the availability heuristic. Tversky and Kahneman proposed that individuals often rely on the vividness and ease with which an event can be recalled from memory when judging its probability [6]. The vividness and perceptibility of disasters make it easy for investors to recall the severe consequences of the event, thereby overestimating the probability and risk of similar future disasters [7]. This non-rationally drives up demand for "green," ESG, and "risk-resistant" assets in the short term [8] and causes funds to rapidly flow toward assets perceived as safer, leading to a decline in asset prices in affected regions. Studies by Misev and Balles [3] confirmed the short-term impact of this disaster-driven shift in investor attention on asset prices.

2.2.2. Geopolitical risk and uncertainty aversion

Geopolitical Risk (GPR) is characterized by high ambiguity, unpredictability, and wide-ranging impact, typically involving conflicts between nations, policy changes, and international sanctions. Studies confirm, often using GPR indices as proxy variables, that investor sentiment tends to become increasingly subdued as geopolitical uncertainty rises, thereby exacerbating market volatility [4].

This psychological mechanism reflects uncertainty aversion. Ellsberg's paradox experiment showed that investors are more likely to avoid risks that are ambiguous and difficult to evaluate clearly [9]. GPR introduces risks that are difficult to quantify. Consequently, investors face probabilities that cannot be clearly assessed, triggering strong uncertainty aversion. This leads to a systematic avoidance of risk assets, causing risk asset prices to fall and safe-haven asset prices to rise, thereby affecting market volatility and increasing the risk premium [10].

2.2.3. Public health crises and loss aversion

Public health crises possess global, persistent, and systemic characteristics, directly threatening individual safety and economic expectations. Thus, these sudden events are the most effective at triggering fear. Studies indicate that negative information during a pandemic significantly increases market volatility and severely impacts stock returns, with an effect much greater than that of positive information [11].

This asymmetric market reaction is a classic manifestation of loss aversion. Kahneman and Tversky, in their famous Prospect Theory, pointed out that the degree of pain an individual feels from a loss is typically more than twice the pleasure derived from an equivalent gain [12]. When facing dual uncertainty regarding health and wealth, investors' sensitivity to potential losses significantly increases [11], which in turn leads to investor overreaction and herding behavior. The market performance in this scenario is characterized by a sharp rise in the fear index (VIX), the

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spread of negative emotional contagion, and a plummet in stock returns, ultimately forming long-term volatility inertia.

3. Research method

3.1. Research methodology: critical literature analysis

This paper adopts critical literature analysis as its main research method. Given that this study falls within the scope of behavioral finance, which focuses on the validation of theories and the comparison of mechanisms, critical literature analysis is more suitable than traditional quantitative empirical research, which often focuses solely on statistical verification.

Steps and Data Sources. In the initial stage of the research, relevant articles from major academic journals and working paper repositories were quickly screened to establish the research direction. Subsequently, at least three core journal articles were systematically identified as the foundation for empirical evidence. A critical analysis of the literature was then conducted to summarize the implications for behavioral finance.

Analytical Framework. This paper utilizes the "shock type—psychological mechanism—market response" correspondence framework. This methodology clearly illustrates the psychological transmission path from different external shocks to market reactions, overcoming the limitations of focusing on a single event. It extracts common psychological mechanisms from various types of crises, thereby providing strong theoretical support for the core research question.

3.2. Empirical evidence and examination of core behavioral mechanisms

This section combines literature data to examine how the three different types of external shocks—natural disasters, geopolitical conflicts, and public health crises—influence the market through specific behavioral biases, compares their differences, and addresses all sub-research questions (SRQs).

3.2.1. Correspondence and examination of core mechanisms

Empirical evidence provides strong support for the correspondence between shock type and core behavioral mechanism, validating the hypothesis of this paper.

Natural Disasters and Availability Heuristic. The vividness of disaster events increases their availability in memory. This heuristic causes investors to overestimate environmental risks [7], leading them to irrationally allocate funds to "green" or "disaster-resilient" assets [13,14].

Geopolitical Risk and Uncertainty Aversion. GPR shocks are confirmed to be a major driver of emotional transmission [4]. Due to the difficulty in quantifying the risk [15], investors are more inclined to avoid ambiguous scenarios and demand a higher risk premium, thus suppressing the valuation of risk assets [9,10,16].

Public Health Crises and Loss Aversion. During a pandemic, investors are affected by negative news, leading to a dual overreaction to potential health and wealth losses [11]. This causes panic selling and results in the asymmetric market volatility [5,17].

The findings that these three types of events affect the market jointly confirm that sudden events primarily transmit their impact through behavioral mechanisms, rather than being simply driven by changes in economic fundamentals.

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3.2.2. Comparison of effect strength and persistence

By comparing the empirical literature on the three types of events—natural disasters, geopolitical risks, and public health crises—this study finds significant differences in the strength and persistence of behavioral effects: Strength Difference. Loss aversion caused by public health crises results in the highest asymmetric volatility extremes in the market in the short term [18]. In contrast, uncertainty aversion caused by geopolitical risks leads to a more persistent and systemic increase in the risk premium [10]. Persistence Difference. The availability heuristic effect triggered by natural disasters is typically the most transient [19], rapidly fading as public attention wanes. Geopolitical conflicts and public health crises, due to the far-reaching nature of their scope and potential consequences, lead to a longer persistence of emotional transmission and behavioral biases, with more significant institutional impacts on capital markets.

3.2.3. Practical implications and risk management

The research findings offer important implications for investment decisions and policy formulation.

Investment Strategies. Investors should identify decisions influenced by emotions during sudden events and avoid overreactions caused by the availability heuristic and loss aversion. Policy Formulation. Regulatory bodies should incorporate emotional indicators and uncertainty indices into macro-prudential frameworks to more effectively detect systemic risks driven by uncertainty aversion. Concurrently, they should proactively design targeted policies to intervene in the volatility amplification effect caused by behavioral biases [20].

4. Critical discussion: mechanism interaction and conditionality

4.1. Mechanism interaction and cross-market conditionality

This section further examines the complex interaction between the psychological mechanisms of loss aversion and uncertainty aversion, and analyzes how their market manifestations are shaped by cross-market dynamics and institutional characteristics.

4.1.1. Manifestation differences in loss aversion and interaction

Although the core mechanism of public health crises is loss aversion [13], its manifestation exhibits significant differences across various markets. For example, Cevik et al. [5] studied the emotional drive of the COVID-19 shock in traditional stock markets, while Yarovaya et al. [12] found herding behavior in the cryptocurrency market during the same period. This difference may indicate that fundamental loss aversion in more speculative, less regulated markets (such as cryptocurrencies) tends to be amplified into more extreme herding behavior, leading to market volatility being transmitted through emotion rather than intensified by fundamental factors. Furthermore, some research suggests that during a public health crisis, loss aversion and the availability heuristic exhibit significant synergistic effects. The vivid, high-frequency reporting of negative pandemic information strongly influences investors' sensitivity to potential losses, triggering loss aversion, which explains why public health crises can generate the most extreme short-term volatility extremes [18].

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4.1.2. Geopolitical risk and cross-institutional transmission conditionality

The essence of uncertainty aversion [9] is the ambiguity caused by a lack of information. The persistent systemic risk premium [10] resulting from geopolitical events is not only due to the risk itself but also because GPR severely weakens financial institutions' ability to quantify tail risks [15]. This compels even rational investors to withdraw due to the difficulty of pricing, thereby exacerbating systemic market volatility. Research further points out that this safe-haven demand significantly pushes up the prices of traditional safe-haven assets like gold during GPR shocks [17]. However, uncertainty aversion driven by geopolitical risk also exhibits conditionality in different institutional environments: In markets dominated by institutional investors, uncertainty aversion primarily affects asset pricing indirectly by raising institutions' internal risk capital requirements and liquidity demands [20]; in contrast, in markets with a higher degree of retail participation, this uncertainty aversion can directly transform into more severe herding behavior, thereby amplifying market volatility.

4.2. Relative contribution of behavioral mechanisms and economic fundamentals

Although this paper emphasizes the dominant role of irrational emotions during a crisis, a critical distinction must still be made regarding the degree of association between different shocks and economic fundamentals. Initially, both natural disasters and public health crises are largely exogenous, non-fundamental shocks, and the market reactions they trigger are primarily driven by psychological mechanisms such as the availability heuristic and loss aversion. Conversely, geopolitical conflicts possess a dual nature: they introduce risks that are difficult to quantify (driving uncertainty aversion to affect the market), but also cause global supply chain disruptions and changes in energy prices (direct economic fundamental impacts). Therefore, future research needs to more precisely decouple these two effects to determine the relative contribution of behavioral factors versus fundamental factors to market volatility across different time windows.

4.3. Research limitations

While this study offers a new perspective by systematically comparing the non-rational behavioral transmission mechanisms caused by three different external shocks, it also has certain limitations. This study is based on existing empirical research that examines behavioral transmission mechanisms triggered by external shocks Such research often focuses on short-term impacts, which may underestimate the role of structural or adaptive behavioral mechanisms in the long term.

The "shock—mechanism—response" framework established in this study has not yet been fully tested for universality across cross-national markets with different regulatory systems and investor structures. Behavioral finance concepts are difficult to measure precisely from market data, thus, the findings in the literature possess a certain degree of measurement bias.

5. Conclusion

This study aims to systematically examine the behavioral mechanisms of sudden external shocks on stock market volatility. By employing the method of critical literature analysis, this research successfully validates the core argument: in environments of extreme uncertainty, the market's price discovery function is impaired, and irrational emotions and cognitive biases serve as key transmission channels affecting asset pricing.

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The primary contribution of this research lies in constructing and confirming the corresponding "shock type—psychological mechanism—market response" framework: natural disasters correspond to the availability heuristic, geopolitical risk corresponds to uncertainty aversion, and public health crises correspond to loss aversion. Furthermore, based on this framework, a comparative analysis of the persistence and intensity induced by these three behavioral mechanisms yields the following conclusion. Firstly, public health crises, which are closely associated with loss aversion, tend to generate the most profound psychological impact on investors and lead to the most extreme short-term market volatility. Secondly, geopolitical risks, driven by uncertainty aversion, often cause the most persistent and systematic elevation in risk premiums, reflecting investors' long-lasting concerns about ambiguous and unpredictable environments. Lastly, natural disasters, typically linked to the availability heuristic, exhibit effects that are generally more short-lived and transient, as investor attention quickly shifts once the immediacy of the event fades.

The findings derived from this study on how the three types of external shocks drive behavioral mechanisms and affect the market offer essential practical implications for financial institutions in risk management: they must move beyond traditional valuation models to incorporate the dynamic monitoring of emotional indicators and behavioral biases into their risk management frameworks. To mitigate the panic-driven overreaction caused by loss aversion and the availability heuristic, policymakers should design targeted information communication strategies to maintain the stability of the financial system.

Future research can build upon this foundation by utilizing more granular investor trading data to deeply quantify the contribution of different biases to tail risk and explore how to design behaviorally-robust investment portfolios to cope with complex and ever-changing external shocks.

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