

Excessive Investor Optimism, Positive Feedback Loops and Market Volatility: A Mechanistic Analysis Based on the Information Waterfall and Herd Mentality

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Abstract. This paper takes the dot-com bubble, the subprime mortgage crisis, and the meme stock frenzy as typical cases to explain the severe decoupling between corporate fundamentals and market prices in financial markets and its causes. It concludes that the "perfectly rational man hypothesis" represented by traditional financial theories cannot explain such phenomena, while the analysis provided by behavioral finance from the perspectives of psychology and group dynamics is more in line with the actual situation. Observations from specific cases show that stock market volatility is mainly linked by optimism, group effects, and the Minsky moment. The socially amplified positive and optimistic sentiment is infinitely magnified through various media or social platforms, triggering people's herd behavior and irrational exuberance, leading to market "overshooting"; coupled with the factor of "stability breeds instability", a large amount of risks accumulated under "stability" ultimately trigger the "Minsky moment", and the market thus shows a "correction". Based on the above elaboration, corresponding regulatory opinions are put forward here: on the one hand, should strengthen systematic investor education to help investors avoid wrong cognitive biases; on the other hand, should improve regulatory rules to curb the amplifying effect of abnormal transactions and excessive leverage on market sentiment.

Keywords: Subprime mortgage crisis, information waterfall, herd mentality

1. Introduction

During certain periods, financial markets have repeatedly experienced disruptions when stock prices, either soaring or plummeting, failed to fully reflect the intrinsic value of enterprises. The 2000 dot-com bubble, the 2007 subprime mortgage crisis, and the recent meme stock frenzy are all concrete manifestations of this phenomenon [1].

In the internet boom that swept the world 20 years ago, global capital poured into technology stocks. At that time, the stock prices of internet companies often entered a state of irrational exuberance, with price-to-earnings ratios far exceeding reasonable ranges and even multiplying in value divorced from fundamentals. For instance, some enterprises that had grown to a certain scale still had not truly achieved profitability, and the business models pursued by many others were not

necessarily clear enough. In fact, the stock prices of internet companies back then were rarely priced based on fundamentals; instead, they were more like bets on their unfulfilled technological prospects. Investors were caught up in the belief that "the internet will change everything" and paid little attention to the sustainability of the companies' core businesses. Eventually, this beautiful fantasy collapsed, and a large number of investors suffered heavy losses—this fully indicates that speculation must not ignore the existence of fundamentals.

The 2007 subprime mortgage crisis pushed the aforementioned chaos to an extreme. Financial institutions, through financial engineering, packaged high-risk mortgages into AAA-rated securities, concealing their true risks, and then flooded the global market with various derivatives. What could have been a local problem thus evolved into a worldwide financial storm. During this period, market valuations were generally distorted, deviating from the true value of enterprises, and the fundamentals of all enterprises, including the banking industry, were obscured. The outbreak of the crisis forced various countries to face the absurdity of the market and the severe consequences of reality. However, people's own emotions may also be amplified by social or psychological factors. They may pay special attention to current events and regard these events as having a significant impact on the future. When people's perceptions of a company or an industry improve, this will have a huge impact on investors' expectations. Optimism may become the dominant factor, and in some cases even reach a state of frenzy; once the actual results fail to meet the picture constructed in people's minds, their emotions will undergo a sudden change, triggering market turbulence. Excessive use of leverage will exacerbate this effect. If investors are already in a high-leverage position, overly optimistic expectations will strengthen the vicious cycle and push up prices, and vice versa. When market conditions change, a similar effect will occur, but in the opposite direction, and amplify market volatility with greater force.

2. Literature review

Traditional financial theories, rooted in neoclassical economics, operate under the core assumption that investors act with perfect rationality—possessing complete information, processing it objectively, and making decisions solely to maximize expected utility, free from emotional biases or cognitive limitations. Models like the Efficient Market Hypothesis (EMH) argue asset prices fully reflect all available information, leaving little room for systematic mispricing. Yet real-world markets repeatedly contradict this ideal: stock prices exhibit unexplained volatility, asset bubbles form and burst, and investors often act against their long-term interests. Episodes from the dot-com bubble and 2008 financial crisis to recent meme stock frenzies highlight the gap between theory and reality [2].

Behavioural finance emerged to bridge this divide, integrating psychology, sociology, and neuroscience to capture the "messiness" of human decision-making. Unlike traditional theories that depict investors as cold calculators, it recognizes individuals are shaped by cognitive biases, emotions, and social dynamics—often leading to predictable irrationality. Herd behavior, a well-documented phenomenon, occurs when investors abandon independent analysis to follow peers or market sentiment, driven by fear of missing out (FOMO) and uncertainty. For example, retail investors may rush to buy a stock in a bull market not due to fundamental analysis (earnings, debt, competitive advantage) but simply because others are profiting. This creates a self-reinforcing cycle: rising prices attract more investors, leading to overvaluation until a correction occurs [3].

These market dynamics are further complicated by inherent unpredictability. Markets alternate between long periods of calm—with prices fluctuating narrowly and muted sentiment—and sudden explosive shifts in behavior. A stock may trade sideways for months before a viral post, celebrity

endorsement, or minor news triggers herd buying, while a buoyant market can collapse abruptly due to regulatory changes, scandals, or macroeconomic shocks. Pinpointing triggers remains challenging: while some catalysts are obvious, many sentiment shifts stem from subtle factors like media narrative changes or social norm shifts. Additionally, individual biases interact with group dynamics—irrational decisions are amplified by social proof, and widespread pessimism can exacerbate downturns. Minsky's idea that "stability breeds instability" provides another perspective [4]. During periods of growth, firms often take on more debt, and investors may feel emboldened to take risks. While everything might appear stable on the surface, vulnerabilities quietly accumulate. Then, a seemingly small trigger—a policy shift or a corporate default—can unleash a broader financial crisis, sometimes catching everyone by surprise. One might think that these crises happen out of nowhere, but the risk usually builds gradually. A classic example is the 2008 global financial crisis: years of loose lending standards and the proliferation of complex mortgage-backed securities created a fragile ecosystem, where the collapse of a single investment bank (Lehman Brothers) triggered a domino effect across global markets.

Market sentiment tends to spread in a way that resembles a chain reaction. Small pieces of positive news, such as slightly higher GDP growth, strong corporate earnings, or a few months of expanding manufacturing activity, can attract attention. Media coverage and research reports often amplify these signals. At the same time, cognitive biases can make these signals feel more significant than they really are. For instance, investors might take a short streak of rising stock prices as proof of a long-term trend, while ignoring overvalued metrics or cautionary notes from analysts. Confirmation bias may further encourage them to share optimistic views widely, reinforcing collective enthusiasm. Gradually, ordinary optimism can turn into something more extreme. Another prevalent bias here is "loss aversion"—the tendency to fear losses more than value gains—which can push investors to hold onto declining assets for too long or jump into rising markets out of fear of missing out (FOMO), exacerbating both bubbles and crashes. This heightened optimism rarely exists in isolation. It can trigger information cascades, where investors base decisions largely on observing the behaviour of others rather than their own analysis. Many individual investors lack access to sophisticated trading data and must rely on publicly available information, such as stock charts or daily trading volumes. If early investors make quick gains—say, 10% over a few days—others may feel pressured to follow, sometimes abandoning independent judgment. The process can snowball: small groups can eventually pull in hesitant participants, including people who might borrow funds just to join the trend. Market behaviour then shifts from cautious optimism to outright frenzy. During such phases, even fundamentally weak assets can experience extraordinary price surges—think of the meme stock rallies in recent years, where companies with limited profitability saw their share prices soar by hundreds of percent in weeks, driven almost entirely by social media hype and collective buying.

During these periods, trading volumes often surge, sometimes doubling or tripling typical levels, and stock prices may jump 15–20% in a short time. Of course, this does not last. Once the initial excitement fades, prices often drop rapidly, sometimes erasing gains just as quickly as they appeared. This back-and-forth contributes to significant market volatility, which seems to be a natural outcome of human behaviour interacting with information flows and financial incentives. What's more, the spillover effects of such volatility extend beyond individual investors: businesses may delay investment decisions amid uncertainty, consumers may cut back on spending, and policymakers are forced to balance the need to stabilize markets with the risk of moral hazard (where bailouts encourage reckless behaviour in the future). Regulators have responded by implementing measures like circuit breakers (which pause trading during extreme price swings) and

stricter disclosure requirements, but these tools can only mitigate—not eliminate—the impact of human psychology on market dynamics. Ultimately, behavioural finance reminds us that markets are not just mathematical models; they are reflections of human nature, with all its irrationalities, biases, and tendencies to swing between euphoria and panic.

3. The underlying mechanism by which excessive optimism exacerbates market volatility

The way market volatility intensifies under excessive optimism is rarely due to a single factor. Instead, it seems to result from a mix of mechanisms—such as information cascades, crowd-driven buying, and self-reinforcing cycles—that interact in complex ways, gradually pushing the market from expansion to collapse [5]. This process can be thought of like a line of dominoes: one event tips the next, and the momentum keeps building until it reaches an extreme.

Even small positive signals—like a brief uptick in a particular sector, rumours of favorable policies, or optimistic reports from analysts—can trigger action among investors who are closely watching the market but lack deep analytical skills. These early moves are often interpreted by newcomers as a sign of something important. Investors without the expertise, time, or confidence to assess fundamentals may simply follow along, creating a cascading effect. As more people join in, the crowd-driven behaviour intensifies. Suddenly, large amounts of capital are focused on the same asset or category, pushing prices up quickly. Even when valuations start to drift far from intrinsic value, the allure of short-term gains pulls in yet more participants [6].

Those who enter early and profit from these rallies often reinforce their belief that the current trend is correct. This forms a kind of self-fulfilling prophecy: as prices rise, expectations of further gains strengthen, attracting additional capital and pushing prices even higher. Over time, market sentiment can reach extreme levels, and asset bubbles may expand significantly. At this point, prices often become largely disconnected from fundamentals such as corporate profits or industry growth, sustained instead by collective speculative excitement [7,8].

However, bubbles are fragile by nature. Their continuation depends on persistent optimism and a steady flow of new investment. Any negative shock—like tighter macroeconomic policies, stricter industry regulation, disappointing earnings, or sudden market changes—can cause confidence to collapse almost immediately. Sentiment swings sharply from euphoria to deep pessimism. The same self-reinforcing mechanisms that drove prices up now work in reverse: falling prices trigger panic selling, which in turn accelerates declines, spurring more stop-loss orders and capital flight. The market then enters a vicious cycle: excessive optimism gives way to pessimism, bubbles burst, and negative expectations feed further declines, significantly amplifying volatility.

4. Conclusion

The intensification of market volatility under excessive optimism is rarely caused by a single factor. Instead, it appears to be the result of multiple mechanisms working in tandem—such as information cascades, herd behavior, and self-reinforcing cycles—which intertwine in complex ways, gradually pushing the market from expansion to collapse. This process can be likened to a row of dominoes: one event triggers the next, with momentum continuously building until it reaches an extreme.

Even weak positive signals—such as a temporary rise in a particular sector, rumors of favorable policies, or optimistic analyst reports—can prompt action from investors who closely monitor the market but lack in-depth analytical skills. These early movements are often interpreted by novices as significant signals. Investors without the expertise, time, or confidence to assess fundamentals may simply follow the crowd, creating a cascade effect. As more participants join, herd behavior

intensifies. Suddenly, large amounts of capital flow into the same asset or sector, driving prices up rapidly. Even when valuations begin to deviate significantly from intrinsic value, the lure of short-term gains continues to attract more participants.

Those who enter early and profit from the rise often become even more convinced of the trend's validity. This creates a self-fulfilling prophecy: rising prices reinforce expectations of further gains, attracting more capital inflows, which in turn push prices even higher. Over time, market sentiment may reach extreme levels, and asset bubbles may expand dramatically. At this stage, prices often become detached from fundamentals such as corporate earnings or industry growth, instead being propped up by collective speculative enthusiasm.

However, bubbles are inherently fragile. Their persistence depends on sustained optimism and a steady influx of new capital. Any negative shock—such as tightening macroeconomic policies, increased industry regulation, earnings disappointments, or sudden market shifts—can cause confidence to collapse almost instantly. Market sentiment swings sharply from euphoria to deep pessimism. The same self-reinforcing mechanisms that once drove prices upward now operate in reverse: falling prices trigger panic selling, accelerating the decline and prompting more stop-loss orders and capital flight. The market then enters a vicious cycle: excessive optimism gives way to pessimism, the bubble bursts, and negative expectations further exacerbate the downturn, significantly amplifying volatility.

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