Original Research Article

Anchoring Bias: The Effect of 52-Week Highs on Trading Volume in the S&P 500

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ABSTRACT

This paper investigates the presence of anchoring bias in stock markets through an analysis of trading volume behavior at prices near the 52-week high. Anchoring bias, originally introduced by Tversky and Kahneman as a cognitive heuristic, is defined as agents' tendency to apply reference points—usually arbitrary or externally generated—to make judgments in conditions of uncertainty. In financial markets, the 52-week high is a reference point that can influence the behavior of investors more than fundamentals necessitate. Using the daily price and volume data of five S&P 500 leaders—Apple, Microsoft, Alphabet, Amazon, and Nvidia—this research focuses on the calendar year 2024. Unlike conventional definitions of the 52-week high, which may be based on intraday trades, this study only used closing price data in the calculation, representing a methodological distinction from prior work. Anchor days were defined by a price-based rule: a day on which the close was within 1% of the then-existing rolling 52-week high. A two-tailed t-test was used to test whether mean trading volume meaningfully differs on anchor and non-anchor days. By emphasizing trading volume rather than price reactions, this paper introduces a novel behavioral measure of investor attention and conviction. The findings hold broader implications for understanding how cognitive anchors shape liquidity, volatility, and market efficiency.

Keywords: Anchoring bias; behavioral finance; 52-week high; trading volume; cognitive heuristics; retail investors

INTRODUCTION

Financial markets have been described by classical theories as being efficient markets, where prices reflected all information available and investors were making rational choices to maximize utility (1). It has been proved, however, by the field of behavioral finance that this is not so, and that psychological forces and cognitive biases direct investor decisions (2). Possibly the most well-documented of these biases is anchoring—the tendency for people to place significant weight on a specific reference point when making a choice under conditions of uncertainty (3).

In investment decision-making, anchoring tends to be based on past price levels, on round numbers, or on technical analysis (4-5). Three anchors have been particularly studied: (a) the investor's purchase price, which drives the disposition effect (6); (b) round numbers such as index levels or stock price thresholds, which function as psychological barriers (5); and (c) the 52-week high, which is prominently displayed in trading systems and financial media (4). This study chose the

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52-week high because it is both highly visible to retail investors and widely referenced by analysts, making it an especially salient psychological benchmark (4, 7).

Despite having no inherent predictive value, this benchmark often influenced how investors perceived a stock's current value and future potential (4). This study examined whether prices near the 52-week high triggered behavioral responses measurable through changes in trading volume.

In an era in which algorithmic and AI-driven trading ever more characterize markets, the continued presence of human behavioral tendencies—particularly on the part of retail investors—poses fundamental questions regarding market rationality (7). Knowing if a psychologically prominent signal such as the 52-week high can continue to drive trading volume provides a measurement of the contemporary salience of cognitive bias in financial choice. This awareness is particularly timely as behavioral prompts—such as "near 52-week high" notifications—are integrated into retail platforms and trading applications (5, 7).

The objective of this research was to determine whether trading volume differed on days when a stock's closing price was close to its 52-week high, potentially reflecting anchoring bias. Daily closing prices and trading volumes for Apple, Microsoft, Alphabet, Amazon, and Nvidia during 2024 were examined, and a two-tailed t-test was conducted to compare mean trading volumes between anchor days (within 1% of the 52-week high) and non-anchor days. This focus on trading volume, rather than price movement, introduces a behavioral measure of investor attention and conviction. The findings highlight how non-informative reference points can continue to influence trading behavior and market efficiency in modern financial environments.

LITERATURE REVIEW

The evolution of behavioral finance as a concept has revolutionized how economists view investor behavior, dethroning the assumptions of classical financial theory (1-2). Classical models such as the Efficient Market Hypothesis (EMH) presuppose that all available information is immediately and fully captured in asset prices and that investors behave optimally to maximize utility. Still, a large body of empirical evidence shows otherwise—real-world investor behavior will typically deviate from this ideal (5, 7). Behavioral finance explores these deviations, drawing much of its understanding from psychology to describe the cognitive biases and heuristics that influence financial decision-making.

One of the most fundamental and largely scaled of such cognitive biases is anchoring. Anchoring is the tendency for individuals to overweigh the initial item of information, or "anchor," received in making subsequent judgments or decisions (3). Tversky and Kahneman initially defined and empirically investigated anchoring in their seminal paper, which remains a cornerstone of behavioral economics (3). In the paper, they demonstrated that individuals estimate by starting at some initial value and then deviating from the initial value. Of special significance, they established that this compensation is often partial, and estimates continue to be biased in the direction of the anchor even when the anchor is irrelevant or random. For example, participants asked whether the percentage of African nations in the United Nations was more or less than a randomly generated number (such as 65) tended to give final estimates biased toward that number, even though it had no factual basis (3).

In finances, anchoring manifests in different ways. In shareholders, it can be to the high of the stock (4), their purchasing price (6), or even to a historic mean (5). Tversky and Kahneman's hypothesis is well-suited for the psychology of 52-week highs as anchors. If shareholders use the 52-week high as a benchmark, they might compare the current stock price with that anchor and make trading decisions based on it (4). The 52-week high now becomes a kind of "mental anchor," that isn't simply influencing only perceived value, but volume and timing decisions as well.

This anchoring tool is particularly important because it operates in the state of uncertainty—precisely when market participants most likely will employ heuristics (1). The 52-week high is a salient and accessible piece of information; it is flashed on most financial news pages, brokerage screens, and even recreational investing software (4, 7). Consequently, it is a logical choice for anchoring behavior. Tversky and Kahneman's theory can be used to explain why such indiscriminate reference points can have disproportionate power in financial markets (3).

Based on this theoretical foundation, Paul Slovic furthered the scholarship in decision-making under uncertainty with his studies of risk perception. Slovic was concerned with the psychological processes by which people perceive and respond to risk, arguing that these perceptions are driven more by emotion

and heuristics than by reason (1). With his efforts, he demonstrated how people tend to employ intuitive opinions and subjective experience in evaluating risky alternatives rather than objective probability or expected value (1).

This realization holds significant implications for trading behavior. Investors may see prices at or near the 52-week high as risky or uncertain, depending on their emotional response to the perceived meaning of that boundary (1, 4). For example, some investors will see a price at or near the 52-week high as an indicator of strength and momentum, but others will see it as a potential point of resistance or reversal point. Either way, the presence of a 52-week high is relevant to perception, which affects behavior—both trading whether to trade and how much to trade (7).

Slovic's research also sheds light on response variation between types of investors. Individual investors, for instance, are more likely to be susceptible to media reports and intuitive judgment, both of which are more likely to report 52-week highs as anchors (1). Thus, retail volume of trading may be particularly vulnerable to such anchors. Institutional investors, however, may be more skilled with more advanced tools and analyses but are also far from immune to their own cognitive biases, especially when facing uncertainty and competition (5, 7).

Slovic's risk perception theory deepens our understanding of anchoring by situating it in a broader psychological framework. Anchoring is not just a cognitive shortcut—it is shaped by the emotional responses to perceived losses, gains, and risk levels. In markets, these reactions produce systematic departures from reason, including clustering of trades at psychologically salient price levels (1).

Even more keenly focusing on the behavioral perspective of financial choice is the work of Hersh Shefrin and Meir Statman, particularly their development of Behavioral Portfolio Theory (BPT). While mainstream portfolio theory assumes investors are risk-averse, mean-variance maximizing agents regarding optimizing mean-variance, BPT proposes that investors construct portfolios in hierarchical layers, each of which corresponds to different goals, risk attitudes, and psychological influences (2). One of the main assumptions in BPT is that investors act asymmetrically regarding gains and losses, are prone to mental accounting, and tend to employ heuristics like anchoring in investment choices (6).

Shefrin and Statman, mention anchoring as a powerful force in asset allocation and portfolio construction (6). They argue that investors tend to anchor to purchase prices and historical highs and employ them as mental categories to determine whether an asset has appreciated or depreciated (6). This creates "disposition effects," where investors are more likely to sell successful stocks (to lock in gains) and retain losing ones (hoping for a reversal). In both cases, the investor's move is based on reference price, rather than fundamentals or expectations of future value (6).

Translating this to action on the market level, then it would logically follow that if many investors are anchored to a stock's high point—such as the 52-week high—they should respond in large numbers when the price gets close to that level (4, 7). There will be those who buy more in anticipation of a breakout, others who sell more to lock in perceived gains. Due to these behaviors, the attention, focus, and cross-behavioral signals can lead to increased volume trading even in the absence of new information (5, 7).

Empirical work has begun to quantify these effects more directly. Empirical findings have revealed that stocks near their 52-week highs experience abnormal returns, increased media coverage, and increased retail demand (4, 7). George and Hwang (2004), for example, determined that the 52-week high is better able to predict subsequent returns than prior price momentum, showing that investors give disproportionate prominence to this anchor (4). Their findings closely align with the Shefrin-Statman hypotheses: investors are not simply responding to rational risk-reward tradeoffs but are influenced by cognitive and affective reference points (6). This work finds that stocks near 52-week highs have higher returns than stocks far from 52-week highs (4).

Other empirical work also lends support for the proposition that price anchors influence not only returns but also volume-based activity. Lee and Swaminathan (2000) found that volume is generally large in well-performing stocks, hinting at a psychological feedback mechanism whereby momentum of price is conspicuous, drawing notice that subsequently stimulates volume (5). The study was not on the 52-week high, but the mechanism is identical: salience in psychology influences investor behavior differently than rational expectations (5).

Subsequent studies have extended these findings with the inclusion of high-frequency data and the trading of retail investors. Birru and Wang (2016), for example, tested intraday trading behavior around 52-

week highs and found that activity increases not just on the day when the high is reached but also on days when the price approaches it (5). Their account is consistent with anchoring theory: the investors view the 52-week high as a salient reference point, and their behavior alters accordingly (7). This is additional support for the conclusion that the high is more than a simple statistical anomaly but a behavioral anchor exerting real market influence (4, 7).

Compared to these developments, relatively few studies have had trading volume as the exclusive principal variable of interest, particularly using an approach based on real-time decision-making (6). Most existing work has found "anchor windows" e.g., ±5 days of the high—which is not how investors really perceive and react to the high in real time (4, 7). By contrast, this paper uses a rolling 52-week high and a 1% proximity band to find "anchor days" that more accurately reflect how investors in fact process provided information (4-5). This approach is taken directly from Tversky and Kahneman (3), Slovic (1), and Shefrin and Statman (2, 6) and adds to the empirical work in a data-driven and psychologically grounded manner.

In general, the anchoring bias is an established cognitive effect with very apparent application in financial conduct (1-7). Tversky and Kahneman's work provides the foundation for the theory in explaining the way that individuals drift insufficiently away from random anchors (3). Slovic's work is notable for highlighting the importance of perceived risk and emotional processing in the making of financial choices (1), providing depth to our knowledge of when and why anchors are significant. Shefrin and Statman carry forward these concepts to the field of portfolio theory, showing how psychological biases, particularly anchoring, guide investor choice at the individual and market levels (2, 6).

This study contributes to that tradition as much as it treats trading volume at 52-week highs as an analyzable and substantive expression of anchoring bias. The study compares volume on anchor days and non-anchor days for a sample of large-cap U.S. stocks over a recent one-year period with the aim of providing evidence on how psychological reference points continue to play a role in today's financial markets (4, 5, 7).

METHODS & MATERIALS

This study used publicly traded stock market data for five large-cap U.S. companies: Apple (AAPL), Microsoft (MSFT), Alphabet (GOOGL), Amazon (AMZN), and Nvidia (NVDA). Selecting these companies was based on size, volume, and extensive investment following bases. All data used in this study were sourced from January 1, 2023, to December 31, 2024, while the primary analysis was based on 2024 data.

Data was extracted using Microsoft Excel's STOCKHISTORY function. For each firm, daily closing prices and daily trading volumes were collected. The data for the whole year of 2023 was used to exclusively calculate the rolling 52-week high for each day of 2024. For each single trading day of 2024, the 52-week high was the uppermost close of the previous 250 trading days.

2024 data was cleaned to remove duplicate records and ensure continuity of trading days. Proper price and volume values were present in all observations. No missing values were present after initial filtering. The data were arranged in Excel with date, closing price, trading volume, rolling 52-week high columns, and a flag in case a day meets the criteria for an anchor day. The primary disadvantage of the STOCKHISTORY function is that it does not return split-adjusted or dividend-adjusted prices. This involved Nvidia, which split its stock in 2024. While this did not impact the volume measurement directly, it introduced some noise into the price history that could shift the identification of anchor days if left in. Since the first outcome measure for this study was trading volume—rather than returns or prices—the impact of this issue was limited, but it is noted here for transparency.

In general, each company's data set contained approximately 250 trading days for 2024, with high data from the previous year on a rolling basis. These structured datasets were the basis upon which the anchor-day identification and statistical analysis described in the following section were performed. To examine the impact of price proximity to the rolling 52-week high on trading activity, The average daily trading volumes were compared for anchor and non-anchor days across each firm.

Anchor days had already been defined in the data set by whether the closing stock price was within 1% of the rolling 52-week high for the day. The choice of a 1% band was guided by both behavioral reasoning and exploratory testing. Narrow thresholds were found to capture investor reactions to psychologically meaningful price points while minimizing statistical noise. The 1% range was selected as it represents a small but perceptually significant deviation that investors are likely to treat as "close enough" to the

52-week high. Tests with wider cutoffs, such as 2% or 5%, produced overlapping classifications that weakened the distinction between anchor and non-anchor days, supporting the 1% boundary as both practical and behaviorally relevant. Out of the set of the remaining trading days for 2024, a random sample of non-anchor days were selected for each company. The number of non-anchor days was variable and was not exactly equal to the number of anchor days. It gave more flexible control while still maintaining randomness.

To determine whether the volume disparity between anchor and non-anchor days was significant statistically, A two-tailed independent-samples *t*-test for unequal variances (Welch's *t*-test) was conducted. This test was selected due to its capacity to correct for both unequal sample sizes as well as potential variance disparities between the two groups. The significance level was at $\alpha = 0.05$. All statistical computations, including group means, standard deviations, *t*-statistics, and p-values, were conducted using Microsoft Excel. The analysis was carried out separately for every firm. Other than p-values, the results provide the direction as well as magnitude of any discovered volume differences. This strategy allowed for a direct and statistically controlled comparison between investor behavior on psychologically significant trading dates, with an emphasis on the dissociation of volume effects potentially due to anchoring bias.

RESULTS

The results of the two-sample *t*-tests indicate that among the five firms analyzed, only Nvidia displayed a statistically significant difference in trading volume between anchor and non-anchor days. This suggests an increase in trading activity that may be attributable to anchoring behavior. The other four firms, Microsoft, Apple, Alphabet, and Amazon—showed no significant volume shifts in relation to the 52-week high. Table 1 summarizes the mean trading volumes, *t*-statistics, and p-values obtained from Welch's t-tests for unequal variances.

As indicated by the p-values, Nvidia was the only company that showed a statistically significant difference in trading volume between anchor and non-anchor days. The magnitude of the difference is also substantial: average volume on anchor days was over 10 million shares higher than non-anchor days. The result is highly significant, with a *t*-statistic of −4.446 and a p-value < 0.001.

Figure 1 is a graphical comparison of the average trading volumes for every company on anchor and non-anchor days. The graph shows the relative consistency of trading volume in all shares but also illustrates the peak apparent in Nvidia.

The final four companies—Microsoft, Apple, Alphabet, and Amazon—did not have any significant differences in volume between anchor and non-anchor days. Apple and Microsoft had a slightly lower average volume on anchor days, though not statistically different. Amazon's volume was essentially equal between the two groups, and Alphabet saw a small, statistically insignificant reduction.

These findings show that the anchoring effect is not uniform across all companies. The sudden surge in trading volume of Nvidia shows that investors' behavior in this stock may be more guided by price-based heuristics. Because of Nvidia's popularity among retail investors, the recent stock split, and positioning within speculative stories of AI and technology growth, it is

Table 1. Comparison of Mean Trading Volume on Anchor vs Non-Anchor Days (2024)

Company	Mean Volume (Non-Anchor)	Mean Volume (Anchor)	*t*-Statistic	p-Value	Statistically Significant?
Microsoft	20,437,945.94	21,169,182.98	−0.635	0.527	No
Apple	57,692,412.60	54,085,058.74	0.688	0.495	No
Nvidia	34,891,900.27	45,718,130.12	−4.446	0.000	Yes
Alphabet	27,953,390.37	25,694,560.13	1.500	0.137	No
Amazon	40,961,722.46	41,299,796.43	−0.180	0.857	No

This table presents the mean daily trading volume for selected large-cap U.S. equities, comparing days when the stock's closing price was within ±1% of its rolling 52-week high ("anchor days") with all other trading days ("non-anchor days"). Trading volumes are expressed in millions of shares. The table provides the empirical basis for assessing whether proximity to a 52-week high is associated with systematic differences in trading activity.

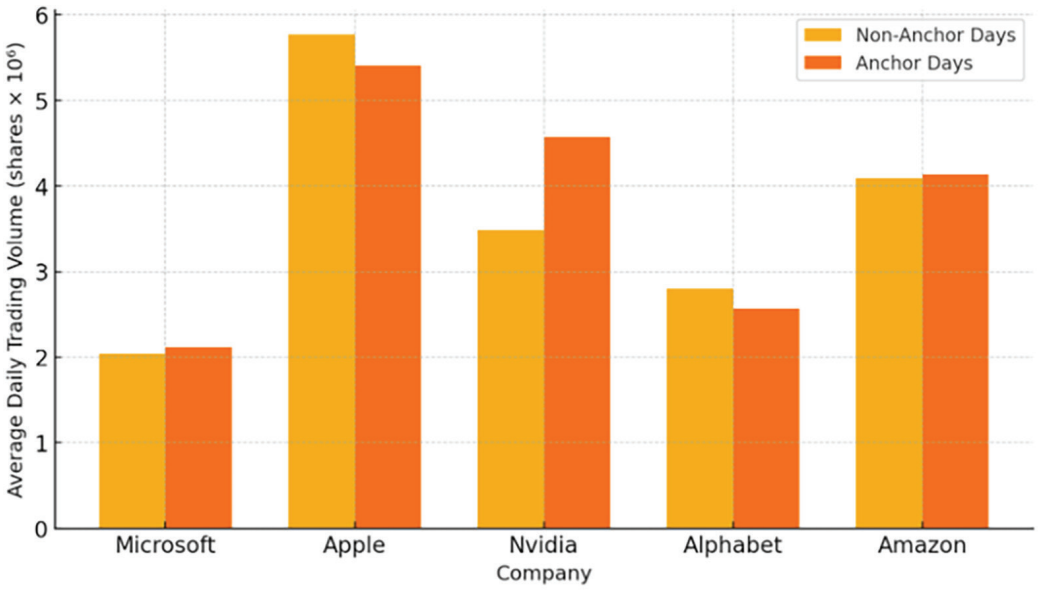

Figure 1. The mean daily trading volume for selected equities under two market conditions: anchor days (closing price within ±1% of the 52-week high) and non-anchor days (all other trading days). Trading volumes are expressed in shares × 10^6, representing millions of shares. The Y-axis indicates the average daily trading volume, while the X-axis differentiates between the two categories. All labels are scaled and formatted for legibility, and redundant information from the legend has been removed for clarity.

safe to conclude that a higher proportion of its investor community is vulnerable to cognitive distortions such as anchoring. At the beginning of 2024, Nvidia's price-to-earnings ratio of 51.68 (calculated by dividing the company's value by its annual earnings) was above the 23.21–50.53 range for the other companies in this sample. This information suggests Nvidia's valuation was the most reliant on expected future growth.

The lack of significance in other stocks would be reflective of either more rational trading behavior or decreased psychological salience of the 52-week high among their investor bases. Alternatively, institutional investors, who dominate trading in mega-cap stocks like Apple and Microsoft, may be less susceptible to visual reference points like the 52-week high. Alternatively, there may be other psychological or structural concerns that win the day in those cases.

In total, this analysis presents qualified support for the effect of anchoring bias on trading volume. While the 52-week high appears to act as a psychological trigger for Nvidia shareholders, the effect could not be found within the broader sample of large-cap firms studied. This discovery supports the importance of firm-specific characteristics in dampening behavioral bias in financial markets.

DISCUSSION

This study assumed that trading volume would be significantly higher on days when the price of a stock is close to its 52-week high. The results are partly consistent with this hypothesis: among the five companies analyzed, only Nvidia experienced a statistically significant jump in trading volume on anchor days. This suggests that while the 52-week high can serve as a prominent reference point, it may not provoke consistent behavioral reactions across all large-cap equities.

The pronounced jump in Nvidia aligns with expectations that anchoring effects tend to be stronger where retail speculation and narrative-driven attention are most active. Nvidia's association with AI investment, its prominence in financial media, and its 2024 stock split likely heightened its psychological salience, reinforcing the 52-week high as an anchor and stimulating a surge in trading activity.

By contrast, Microsoft, Apple, Alphabet, and Amazon—firms characterized by high institutional ownership and extensive algorithmic participation—showed no statistically significant fluctuations in trading volume near the 52-week high. This variation may reflect

underlying structural differences in market behavior. Companies with substantial institutional holdings typically exhibit more model-driven and long-horizon trading, where decisions are guided by quantitative rules rather than intuitive heuristics. Institutional dominance may therefore dampen psychological effects that would otherwise manifest through retail-driven trading. Additionally, the prevalence of algorithmic and high-frequency strategies could act as a confounding factor, since automated systems respond to price momentum and liquidity rather than cognitive anchors. These interactions suggest that anchoring effects may not operate uniformly, but instead are shaped by investor composition and the technological structure of trading.

These findings align broadly with the theoretical foundations of behavioral finance. Tversky and Kahneman's anchoring framework describes how individuals rely on salient reference points to frame decisions under uncertainty. Nvidia's surge in trading volume appears consistent with this mechanism, where the 52-week high served as an anchor influencing investor attention and behavior beyond fundamental valuation. Similarly, Slovic's theory of risk perception provides context: emotionally charged cues, such as a stock nearing its annual high, can amplify perceptions of opportunity and trigger instinctive rather than rational responses—particularly among retail participants. Shefrin and Statman's Behavioral Portfolio Theory also helps interpret this behavior, as investors anchored to the 52-week high may have pursued layered goals—such as profit-taking or avoiding regret—driving trading volume through nonrational motivation.

This research adds a distinctive empirical contribution to anchoring literature. While George and Hwang (2004) examined abnormal returns near the 52-week high, the present study shifts focus to trading volume as a behavioral manifestation of attention and engagement. The divergence in findings across firms highlights that anchoring can influence market activity without necessarily affecting price performance. Birru and Wang (2016) similarly observed increased trading when prices approach recent highs, though this study finds such behavior concentrated in Nvidia, reinforcing the importance of firm-specific factors. Lee and Swaminathan (2000) further supported the idea that salient price momentum attracts attention and volume—partly confirmed here.

Nonetheless, this study faces certain limitations. Reliance on daily volume data masks intraday dynamics, potentially overlooking clustering effects at market open or close. The data also combine institutional and retail trading, obscuring differences in behavioral sensitivity between the two groups. Moreover, Nvidia's 2024 stock split, while methodologically controlled for, could have influenced trading through affordability and liquidity effects beyond mere visibility. Finally, the 1% proximity band used to define anchor days—while methodologically sound—may not fully capture the psychological perception of "closeness." A flexible or sentiment-adjusted threshold might yield deeper insight.

Future research could employ higher-frequency data to capture intraday behavioral patterns or disaggregate volume by investor type to assess which groups are most influenced by price anchors. Expanding the sample to include mid-cap, small-cap, or international equities could reveal whether anchoring effects vary across markets. Finally, integrating sentiment analysis or media exposure data could help quantify psychological salience more directly, linking cognitive attention to observable trading activity.

CONCLUSION

This research examined whether trading volume is influenced by psychological anchoring to the 52-week high—a widely employed but non-fundamental anchor. With two-sample t-tests of five of the largest U.S. technology stocks, the test yielded sparse yet powerful evidence of anchoring bias, with Nvidia alone exhibiting a significant volume boost near the high. The findings partially confirm the hypothesis: anchoring will affect trading volume, but the effect is highly context-dependent and contingent. The speculative narrative, stock split, and high retail trading of Nvidia probably overestimated the behavioral effect, and other firms with strong institutional trading experienced more rational volume patterns. This work adds to behavioral finance by drawing on the anchoring idea and extending it to volume—a relatively unstudied but telling measure of market behavior. It further supports the necessity of examining behavioral catalysts in real-time, retail-confronting settings, particularly as electronic trading interfaces continue to shape the way investors process price data. In summary, cognitive biases remain relevant in the high-tech markets of today, particularly in contexts where narrative and salience cross. Knowing when and where they will show up is essential to investors, policymakers, and platform designers.

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CONFLICT OF INTERESTS

The author declares that there are no conflicts of interest related to this work.

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