

Meme 'Stonks': How Call Options & Reddit Broke Wall Street | Lilly Francus

February 2nd, 2021

I've memefied myself for all of eternity, and I'm happy to be recorded saying as much. — Rod Alzman

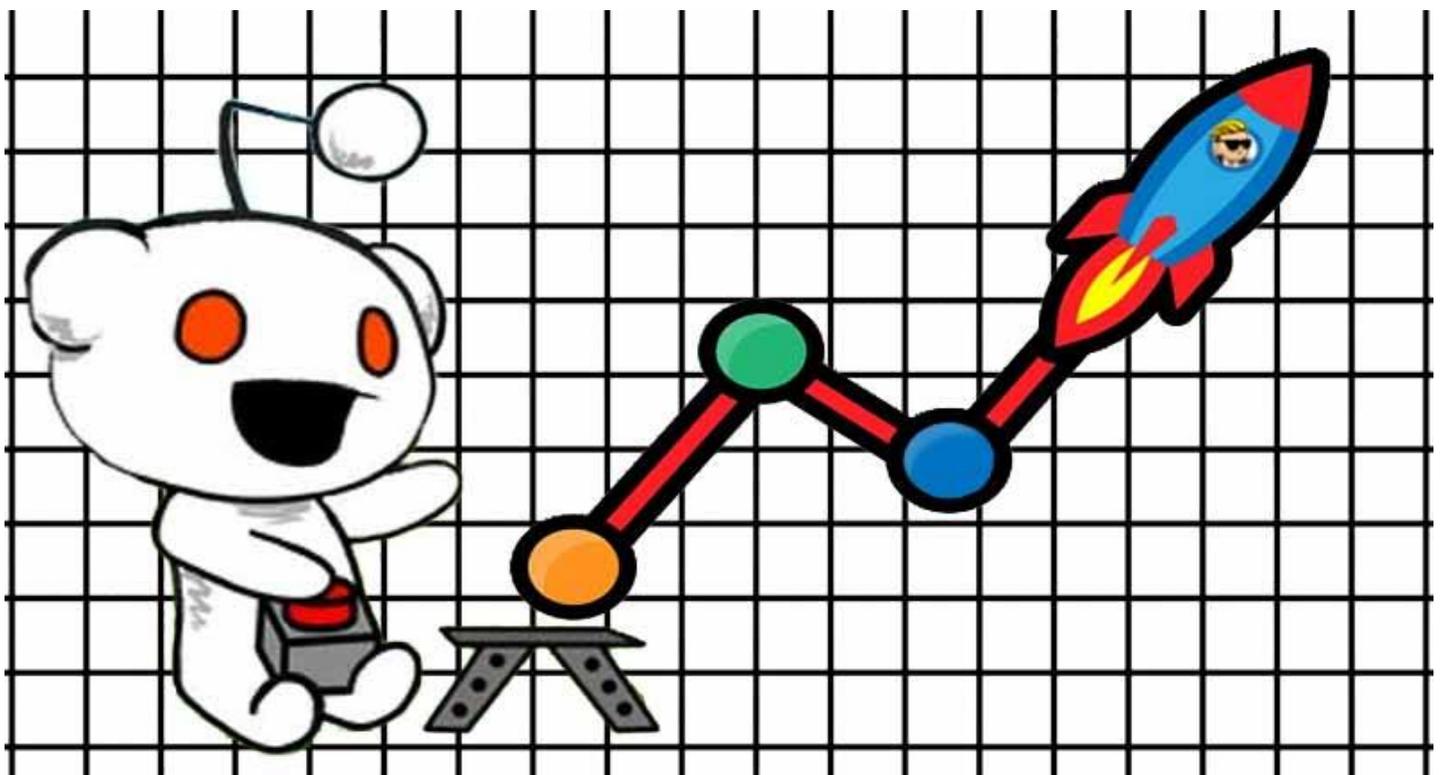
INTRODUCTION

Lilly Francus is a 25-year-old PhD student in bioinformatics at the University of California, San Diego. Before she got into the markets and started her PhD, she was a software engineer for multiple years at LinkedIn and Stripe. She's passionate about data and modeling complex, dynamic systems, and has a strong interest in options and memes, in that order. Her background is primarily a mixture of computer science and business administration.

WHY DO I CARE?

One of the things that I find tiresome and detrimental to the public good are all the "hot takes" that people seem compelled to want to do whenever a big story breaks or there is some "newsy thing" that everyone seems to be talking about. Our egomaniacal society cannot help itself. Millions of people, irrespective of their financial standing or understanding don't want to feel left out. Maybe they want approval. Maybe they want to feel included. Or maybe they just enjoy the excitement of it all. Yet, for others, these moments represent calculated opportunities to pump their own stock, so to speak. We saw this with a number of prominent billionaires this past week who joined in on the populist fervor to declare themselves shepherds of the common man (i.e. the retail investor) who has been, for far too long, shackled by our captured regulatory bodies, which favor Wall Street at the expense of Main Street.

Of course, using the language of class struggle to describe what is going on with story stocks this last week is absurd. It should actually be insulting to the intelligence of most people, but for whatever reason, human beings cannot seem to help themselves. We love to turn charlatans into



demigods. We give permission to rant and rave on our behalf, and in return, they glorify themselves with money and power. When I saw one prominent billionaire on CNBC this past week castigating the financial media, Robbinhood, and Wall Street writ large, the image that kept popping up in my head was Donald J. Trump during his primary bid for the Republican nomination. The names are different, but the characters are the same. Instead of Jeb Bush, we have Kenneth Griffin. Instead of Anderson Cooper, we have Scott Wapner. In place of the MAGA movement, we have the [r/WallStreetBets subreddit](#).

Exploring this phenomenon—the observation, in other words, that the same underlying force driving political populism is manifesting in financial markets—is worthy of its own episode, and perhaps, I will produce on in the near future. However, a subject this complicated needs to be pulled apart and carefully examined, lest we fall pray ourselves to the “hot take” phenomenon. To that effect, I’ve decided to proceed first with an episode exploring the mechanics that have made this story possible.

In my view, there are two components to this. The first relates to market structure and the endogenous dynamics of the options market, including the role of market makers and clearing houses, along with the regulatory requirements that influence their behavior. The second relates to culture and communication on the Internet, which is another way of talking about “Internet memes” and how they are used to organize, coordinate, and execute on large-scale social movements or actions (in this case, pumping a stock). One of the things that makes my guest so interesting (and unique) is that she has an understanding of both of these components and her writing on the later (memes and Internet culture) is rather brilliant. So, while we will discuss market structure, the cultural dynamics as expressed through memetics on the Internet is something that I really look forward to exploring with Lilly today. My goal is for those listening to come away with a much deeper appreciation and understanding of just how significant these narrative building tools are and just how important they are for spreading clear, actionable messages on the internet that result in large scale actions like the near 10x’ing of a stock’s price in a matter of a week.

BACKGROUND:

Background — Q: Could you tell us a little bit about yourself? I understand you are currently getting your PhD in bioinformatics.

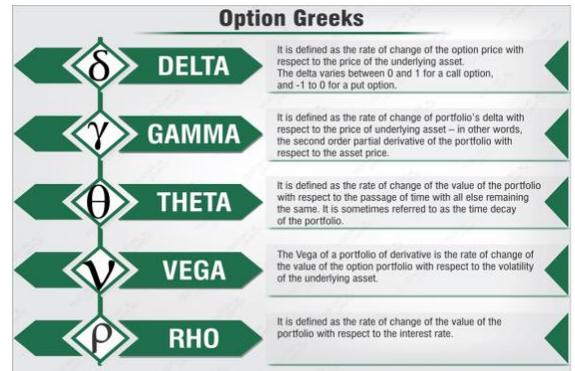
Bioinformatics — Q: What is bioinformatics? Q: How is it relevant or related to your interest in options trading an Internet memes?

@nope its lily — Q: What’s with your social media handle? Q: Where does the name come from and what does it mean?



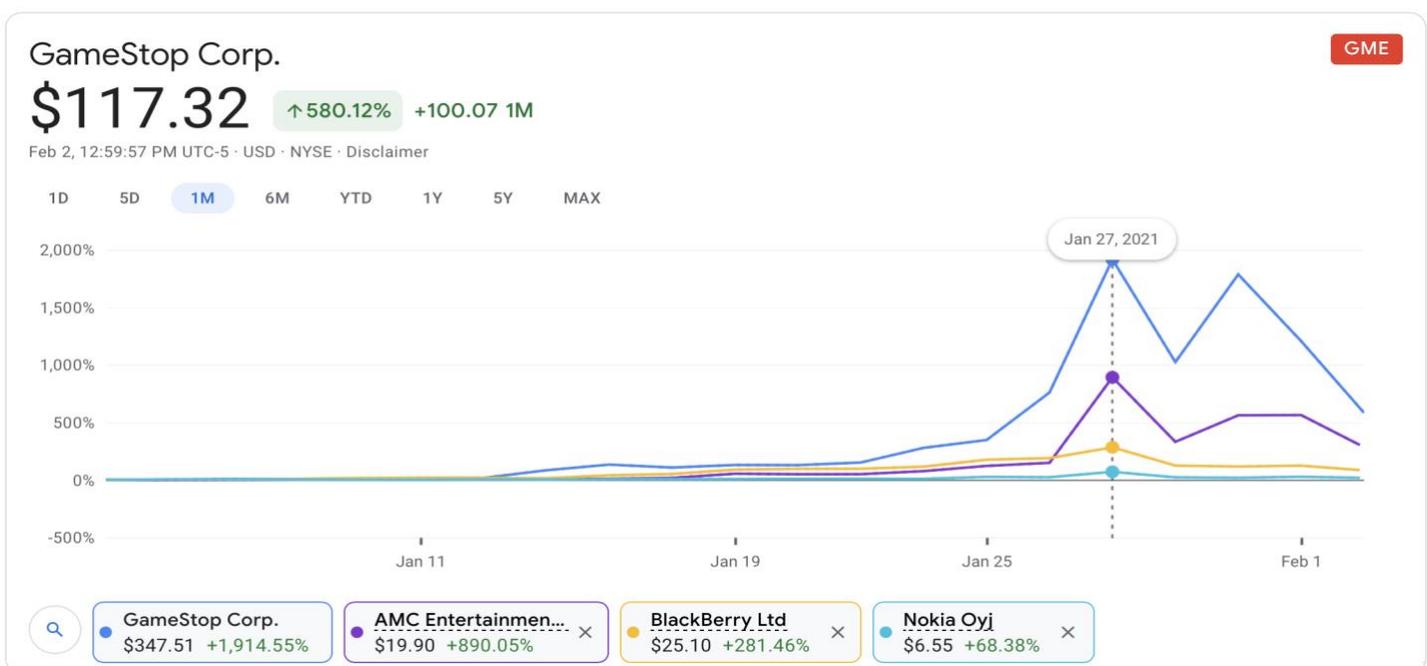
MARKET MECHANICS:

Summary & Update — Q: Could you get me and our listeners up-to-date on this story that seems to have captured the American zeitgeist in the last week? This began as an exciting but rather narrow financial story about the pumping of a video game retail stock to now having become a social and political movement about power, corruption, and social inequality. Q: How did this happen? Q: How accurate is this depiction of the mainstream interpretation and how accurate is this interpretation in your view?



Market Structure — I'd like to break this down for listeners. Let's focus first on the market structure component of this story. Q: How much of the movement in \$GME was driven by endogenous factors related to derivative contracts and positioning—notably, short-dated call options—and the pressure that a crowd sourced pump could apply on a stock whose short interest has exceeded its available float (e.g. naked shorting) for the last six months or say? Q: Can you explain the mechanics of how this works? Q: How much of this was just reflexive put option buying or short positioning by market makers who were facilitating a regular stream of call option buying on the stock?

The “Greeks” — I'd like to breakdown some of math (i.e. the Greek letters delta, gamma, & theta) embedded in options contracts and how they relate to the mechanics of how GameStop's stock went parabolic. Q: What is Delta? (** the delta of an option is the probability of that option being in or out of the money at expiration) Q: What is Gamma? (** the gamma of an option is the rate of change in its delta per 1-pt move in the underlying asset's price...as the price of the underlying moves closer to the strike price of the option, the gamma increases because it takes a smaller move in the underlying assets price to move its delta/probability that it will expire ITM...likewise, as an option moves closer to expiration, the gamma increases because the probability of the option expiring in the money is highly sensitive to time, and the less time, the more sensitive) Q: What is Theta? (** the theta of an option measures the rate at which the option loses value as the option moves closer to expiration)



Short-dated Call Options — **Q:** How important is it that people on this subreddit were using short-dated options (in some cases, 0-day-to-expiration) to speculate on the price of GameStop? **Q:** In other words, how much more difficult would it have been to pull this off if they didn't own options with such high gamma? **Q:** How were people coordinating to pump the stock towards the end of the day? **Q:** What were we seeing in terms of demand for and price of 0dte call options during this last week?

Trading Halt — **Q:** How significant was the halt in trading that was imposed by Robinhood and how much had the majority of the up move already completed as a result of the types of dynamics that we've just discussed?

MEME MECHANICS:

Shower Index (salience) — **Q:** What is the "shower index?" **Q:** How does it capture the quality of "salience" that you highlight as an integral component to the virality/power of any particular stock or meme?

Cataly-ish — **Q:** What is a catalyst in the context of what we are describing? **Q:** Is a catalyst always necessary? **Q:** What is an example of an ideal catalyst? **Q:** What was or were the catalysts in the case of \$GME?

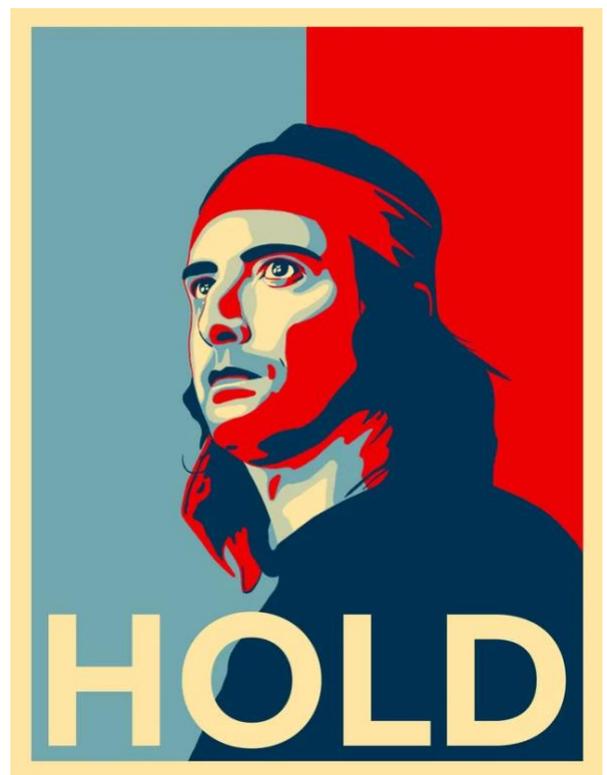
Humor — **Q:** How does humor factor in when it comes to assessing the power of a narrative and/or the salience of its memetics? **Q:** What are examples?

GameStop (Brand Recognition + Nostalgia) — **Q:** What are the characteristics of GameStop as a cultural idea that gives it value & salience?

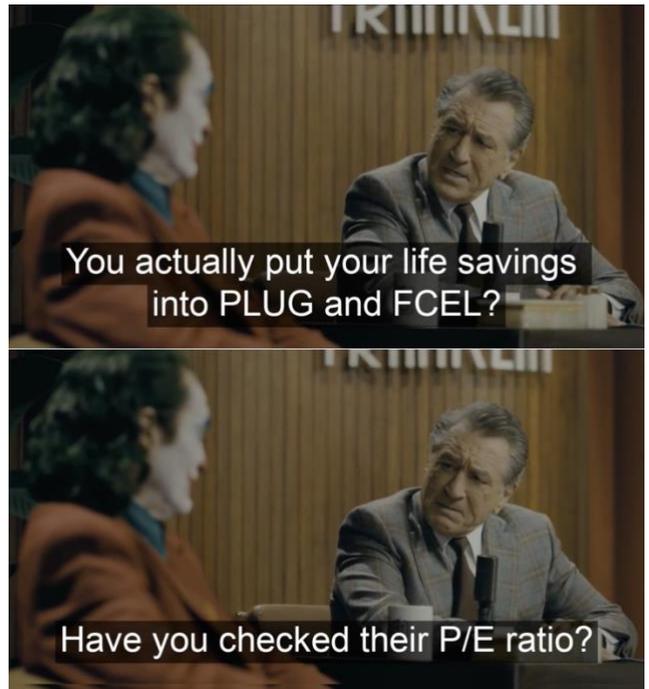
Tesla (Reality Distortion, Optimism, ESG) — **Q:** What are the characteristics of Tesla as a cultural idea that give it value and salience?

BREAKING DOWN THE NARRATIVE:

Key Players in GameStop — Some of the key players involved in the GameStop/\$GME narrative have been /u/DeepFuckingValue (a.k.a. [TheRoaringKitty](#)), Ryan Cohen (Former Chewy founder), Melvin Capital (Long/Short Hedge Fund), and "Boomer" George Sherman (CEO of GameStop) **Q:** Who are the key players involved in the GameStop narrative? **Q:** Who are the heroes and who are the villains? **Q:** Can we break this down even further? (i.e. who is Chamath, DDT, Elon, etc.?) I feel like Elon and DDT would fall in the category of mentors or magical helpers, whereas someone like Chamath may fall more in the category of trickster...



Narrative-Investing — You've been pretty vocal about how you believe that "understanding the impact of the narrative will be a critical component of investing going forward," and that "with the increasing participation of retail and the penetration and hyper-connectivity of the online world, the narrative will, at least for a time, dominate. Understanding it, therefore, seems critical to investing success." Q: Why do you believe that understanding narrative is more important today than it was in say the 1920's or 1990's when we had large manias in the stock market? Q: Is it possible that we just have more tools and data at our disposal today, and so, we are in a position to analyze this in more detail?



Pandemic On/Off Trade — Q: Is there a pandemic on/off trade whose influence flows into the memesphere that we can measure? Q: How does it manifest? Q: What is its impact on stocks and on what types of stocks?

Money Printer Go Brrrr Narrative — Q: What is the role of this large theme around money printing and the devaluation of the dollar? Q: What would be the theme and what would be the narrative? Q: What are some examples of relevant memes?

REFLEXIVITY + HYPERCONNECTIVITY:

Reflexivity — Q: What is "reflexivity?" Q: Where does the concept derive from in terms of its financial application?

Hyperconnectivity — Q: What is "hyperconnectivity?" Q: What is the relationship of reflexivity to hyperconnectivity? Q: Is there any way to measure hyperconnectivity & its increased prevalence?

MEME-MAPPING:

God Meme — Q: What is a "God Meme?"

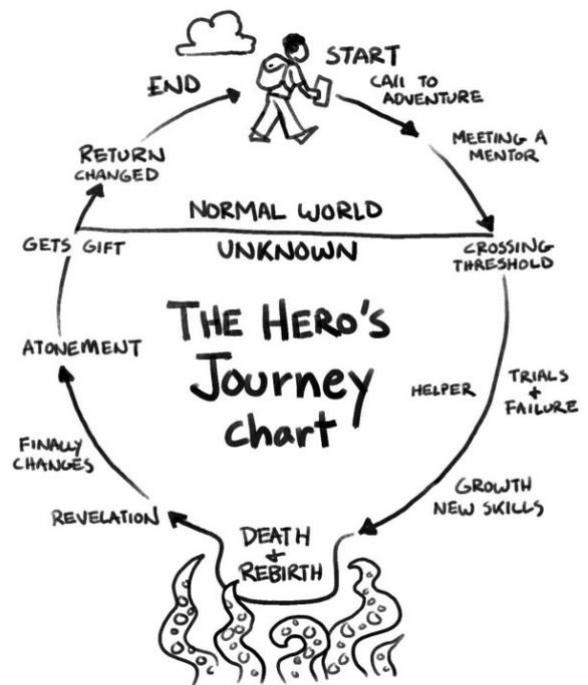
\$TSLA as Nuclear Bomb — Q: Why do you say that Tesla is the nuclear bomb and not Elon, who straddles several different companies and seems to be the King Midas of ESG and Futurist investing?

L1, L2, etc. — Q: How do we map the blast radius of a God Meme? Q: What are examples of L1, L2, etc., for Tesla? Q: What are similar examples for GameStop?

MISCELLANEOUS:

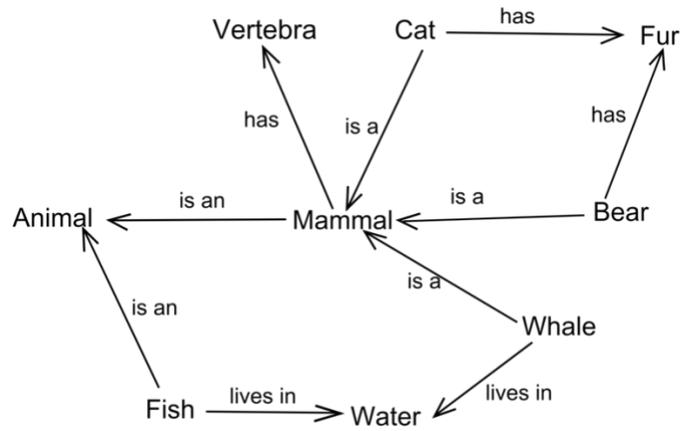
STONKQ — Q: What explains people's willingness to speculate in the stock of companies that are currently in bankruptcy? (e.g. full Ponzi embrace)

Nihilism & Dopamine — Q: Can we discuss my nihilism hypothesis and the role of social media in creating a dopamine kick that off-sets normal levels of risk-aversion?



QUOTES:

What's interesting though about memes in general is they tend, much like genes, to simplify in complexity over time. In general, memes that harken back to a simple symbolic idea (feeling depressed, overwhelmed, popular cultural icons like Baby Yoda, cats being cute) tend to survive the longest, eventually achieving fixture status (even if they may be vintage or unpopular by now, like lolcatz). This is analogous to a game of telephone (or, for the more biologically minded, replication and mutation) — at each step of transmission, there is some loss of information, and the ideas that can be compressed the best tend to remain while others fade into the aether. — [Lilly Francus](#)



As an idea is rapidly transmitted through a medium and replicated, it tends to lose all but its most defining characteristics. This is why, for instance, in online echo chambers — Parler, for example — ideas tend to reduce to more extreme, basal forms, crystallizing on human emotion (in the case of conspiracy theories, distrust and anger) and captivating followers even against common sense. You don't need rationale or evidence or even really strong due diligence if a ticker has enough salience. — [Lilly Francus](#)

Simply put — the narrative effect here dominates. Despite the naivest interpretation (speculators are hoping to replicate the potential short squeeze observed on GameStop), in the real world low-information investors (most daytraders, for example) tend to gravitate towards names with high memorability. Everyone remembers the Roomba; few people even know what a ligand is. — [Lilly Francus](#)

GameStop and Tesla, in my opinion, represent some of the strongest examples of salience (and therefore meme power), although for largely different reasons. — [Lilly Francus](#)



If you're tracking on the concept of salience as a determinant for stock success, the idea of humor as integral to the story should come as no surprise. In general, humans tend to remember humorous information far better and more accurately than non-humorous information. This provides a supporting base to salience — a narrative, funny to its core, propagates as a meme much more quickly and for far longer than an unfunny one. ... it's a lot easier to present a stripped down story, or provide incomplete or spurious reasoning for investing in a stock if well, it's fucking funny. — [Lilly Francus](#)

In this narrative, DFV craftily set the groundwork for the meme as the willing hero, who took the Call to Action while still remaining in the mortal world. — [Lilly Francus](#)

GameStop, much like Tesla, was a simple story, centered around a hero each of us could personally identify (the anonymous account), armed with the help of the supernatural (a billionaire pet food guy) against a reviled foe (the hedge funds and Wall Street). It could not have been more perfect. — [Lilly Francus](#)

It's my humble opinion that understanding the impact of the narrative will be a critical component of investing (it has always been a mainstay in venture capital, for example, except for economic downturns) going forward. With the increasing participation of retail and the penetration and hyper-connectivity of the online world, the narrative will, at least for a time, dominate. Understanding it, therefore, seems critical to investing success. — [Lilly Francus](#)

In a normal year, there are rarely such market-wide themes of course, but there always have and always will be themes. What's more interesting about this paradigm, however, is the speed in which themes can shift, which I'd argue is driven by the increasing hyper-connectivity of the marketplace. — [Lilly Francus](#)

In a hyper-connected world, we should see reflexivity as not just one force acting on price discovery, but perhaps the dominant force. — [Lilly Francus](#)

...successful ideas (memes) in hyper-connectivity share similar characteristics — they are simple, they are salient, and they appeal to basal emotions. This holds true for trends and narratives — in our super-hubs of low information traders, the simplest ideas will dominate the conversation, shaping the trading decisions of multitudes and shifting price far more than fundamentals, news, or reality should imply. — [Lilly Francus](#)

Investing in a hyper-connected world tends to follow the power of the narrative, especially with the advent of low-information investing and trading. — [Lilly Francus](#)



The impulses and groupthink of investors in reaction to news and catalysts tends to lead to reflexivity, which is a major component of stock boom-bust cycles. — [Lilly Francus](#)

In a hyper-connected world, trends (time periods dictated by themes) tend to be more dominant and also shift quicker. — [Lilly Francus](#)

Trends tend to coincide with simple ideas appealing at some level to fear (fear of loss, FOMO) and greed. — [Lilly Francus](#)

A god meme, in this paradigm, is the epicenter of the narrative, which usually follows (or sometimes sets) a theme and starts the trend. Two fantastic and simple examples of the god meme are Tesla and GameStop. In Tesla's case, while cultural shifts towards ESG have been an undercurrent for years, Tesla's rise as the reigning meme stock of 2020 dramatically accelerated the zeitgeist. Tesla effectively was the nuclear bomb which in its blast radius (success) led to cash inflows (and therefore price increases) throughout its semantic network, to varying degrees. — [Lilly Francus](#)

(1) Cash inflows radiate from the god meme/L0 to semantically associated stocks in a predictable proportion and sequence. ... (2) Associations can be made through time and space. ... (3) Hyper-connectivity begets reflexivity. ... (4) Multiple themes can coexist in a trend, but one usually shows dominance. ... (5) Trends can ebb and flow in response to catalysts in the God meme, but the farther the association the less impacted. ... (6) In general the God meme will be the most salient, simple narrative. — [Lilly Francus](#)

I've memefied myself for all of eternity, and I'm happy to be recorded saying as much because look, it's fun. That's the thing I think people are missing. It is speculative. People are gambling right now. If you're buying GameStop at this price point you are buying because you believe it will keep going up. — [Rod Alzmann](#)

GameStop had the man's boot on its neck. This company was trying to be dragged down by these big, moneyed parties and interests. So, you've kinda got that contrarian, like rage against the machine type feel where people were like you know what screw it, I like this company too. — [Rod Alzmann](#)

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