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Reddit's self-organised bull runs: Social contagion and asset prices

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Extended Abstract

In investigating the stock market crash of May 28, 1962, the Securities and Exchange Commission (SEC) found that: 'investor "psychology" being what it is, the increasing decline in one or several issues can easily spread to others. Once the process becomes generally operative, the stage is set for a serious market break' (1963). The SEC concluded that large institutions acted as a balancing force during the collapse. The report pointed at retail traders as the *key players* behind the widespread panic.

Over half a century later, we are again confronted with the consequences of investors' social behaviour. As online discussants on Reddit's 'WallStreetBets' (WSB) forum drove up the price of GameStop shares in January, 2021, retail investors regained a spotlight on the (virtual) trading floor. A key difference between 1962 and today is the internet, which offers both a coordination platform on an unprecedented scale, and a new datasource on investor narratives, interactions and psychology. This paper sets out to reconcile the behaviours on social media with economic theory.

We begin with an empirical analysis of the data. First, we examine the extent to which individuals trade based on their stated beliefs about an asset's predicted performance. We manually extract positions from screenshots publicised on WSB and sentiments using supervised text analysis. Expressing a positive sentiment about an asset on WSB raises the probability of a long investment in the same asset in the future by over six times. The effect is not symmetric - expressing a negative sentiment raises the probability of a short investment only 2.5 times. Neutral sentiments appear to be highly predictive of long positions. The strong, statistically significant link between the sentiment of a WSB user and their subsequent positions demonstrates the credibility of the discourse on the forum, in terms of compelling users to trade along their stated interests.

Our stylized model sheds light on the relationship between investor beliefs and returns. We consider risk-averse investors who demand assets with uncertain payoffs based on personal valuations, and we assume that there is some exogenous supply of the asset. Knowledge of other investors' demand is useful because it helps investors predict the tendency of the price to go up or down through market clearing. This knowledge complements individual valuations and can impact returns.

The second part of our paper presents an empirical estimation of our model's parameters, focusing on social contagion and price extrapolation among users of WSB. Our main goal is to quantify the extent to which expressed sentiments are influenced by so-called 'peer effects'. To accomplish this, we test how peer sentiment impacts investor decision-making in two ways. First, we select individuals who express sentiments about an asset multiple times and observe how peers discuss the same asset in between. We use historic peer sentiment as an Instrumental Variable (IV), which mitigates the common shock problem. This approach is inspired by the peer effects in the classroom literature, which gauges future student performance based on entry

exams (Duflo et al. 2011). Second, we leverage the WSB network of interactions to identify the information to which an individual investor has been exposed. The network links an older submission about an asset to a new submission if the author of the new submission comments on the older submission. To estimate a parameter for social contagion, we regress the sentiment expressed by the new submission on the average sentiment of older, linked submissions. We use the timing of our IVs to control for common shocks and instrument the sentiment of linked submissions to control for an author's endogenous choice to comment.

In both approaches, exogenous variation in average peer sentiment is a statistically significant predictor for the change in author sentiment. This finding suggests that retail investors experience investment complementarities and adapt their strategies based on those of their peers. The instrumental variable (IV) results reveal that when the odds of peers expressing bullish over bearish sentiments double, the odds of a given user expressing bullish over bearish sentiment increase by an average of 14%. Although the role of narratives in investor decision-making has been extensively discussed in the literature, this work is, to the best of our knowledge, the first to document a relationship between an investor's sentiment and that of their peers outside a controlled experimental setup (Bursztyn et al. 2014).

This empirical exercise sheds light on several phenomena regarding how investors respond to various signals. First, we confirm that retail investors on WSB tend to be trend-followers. Specifically, a log-return of 0.1 on a given day increases the probability of a user posting a bullish over bearish post by twenty percent. Second, we explore how retail investor sentiments respond to market surprises, defined as log-returns that are two standard deviations above or below its monthly average. Interestingly, the effect is negative for both positive and negative market surprises, but the positive surprise has a low level of statistical significance. This finding suggests that downside panic can spread quickly among investors. Finally, our experiment highlights the role that reinforcement between peer sentiments and market performance plays.

In the final section, we synthesize our model and empirical observations of WSB users to measure their impact on returns. Our main strategy centres on predicting variation in sentiments among WSB users unrelated to current price changes, leveraging the strong temporal persistence of sentiments to specific assets due to the peer effect channel. Our estimates are both statistically and economically significant in predicting changes in weekly average log returns, providing evidence for a relationship between social dynamics, as proxied by WSB conversations, and financial markets. Overall, our analysis underscores the importance of considering the social aspect of retail trading when attempting to understand the dynamics of financial markets.

References

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