Retail investors and media psychology

Ross Dahlke

Recent events surrounding GameStop stock, the trading platform Robinhood, and the investor forum r/WallStreetBets have shown how media can drive massive fluctuations in global financial markets. Business scholars have extensively studied how media and information contribute to movements in stock prices. However, there remains a gap in the literature of how individual investors seek out, process, and act on media. Media psychologists can help to fill this research gap. Instead of studying media's effect on financial markets, media psychologists should study how media relate to individuals who are participating in financial markets. In other words, media psychologists should study people, not the markets, as the dependent variable.

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Word count	2777	2801
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Reading time	13.9 minutes	14 minutes

Introduction

Financial markets were recently upended by historic price fluctuations in a cadre of stocks including GameStop, AMC Entertainment Holdings, BlackBerry, and Nokia. Individual investors made tens-of-millions of dollars, often with leveraged positions. What is particularly unique about these events is that they were triggered by individual investors. These retail investors–bolstered by government-issued COVID-19 stimulus checks, Robinhood, a free stock trading app, and an abundance of free time due to the COVID-19 pandemic–organized collective behavior actions on an internet Reddit subforum r/WallStreetBets.

Media commentators were quick to speculate on the meaning of the events, often pointing to class warfare, new-age populism, or young, lonely men being bored at home. However, there is a large body of academic literature on psychologial motivators of in-

vesting and personal finance. For example, gender, age, marital status, income, and other demographics impact trading behaviors (Kannadhasan 2015). Or, that most investment decisions can be boiled down to individuals' psychological dimensions of financial anxiety, optimism, financial security, deliberative thinking, interest in financial issues, and needs for precautionary savings all drive individual financial decisions (Talwar et al. 2021). However, how individual investors consume and influence media remains an open question. While business scholars have established the causal link between media and changes in stock prices, they miss the step in the causal diagram of how individual investors seek out, consume, and act on media.

First, I discuss relevant academic research to the recent GameStop saga, specifically talking about retail traders using Robinhood during COVID-19, academic perspectives on the GameStop price movements, and r/WallStreetBets. Then, I summarize scholarship into how media affect financial markets, including newspapers, television, and social media. Finally, I show how gaps in our understanding of individual investors and how they consume and act-on social media can be addressed by taking a media psychology approach.

COVID-19 and Retail Traders

The COVID-19 global pandemic has spurred a rise in retail investors that rivals the boom of retail investors during the internet bubble. At the center of the rise in retail investors is Robinhood. Robinhood is a smartphone app and stock trading platform that offers free trading of stocks and other securities. While other trading platforms have since adopted free trading, Robinhood created and maintained a significant following by being the first to offer free trading, gamifying its user interface, and targeting young, new investors. With Robinhood easing barriers of entry for new investors, financial stimulus checks from the government due to the pandemic, and newly-found swathes of free-time, these retail investors grew in size and influence during the pandemic.

Retail investors now routinely account for 20% of stock market activity (Pagano et al. 2021). These retail investors on Robinhood significantly impact financial markets by driving stock prices up or down, particularly during COVID (Pagano, Sedunov, and Velthuis 2020). Users of Robinhood increased the amount of money they invested on the platform during the pandemic (Welch 2020). Robinhood traders primarily engage in momentum and contrarian strategies. For momentum trades they invest in stocks that have already demonstrated rising price momentum. They also participate in contrarian strategies when they "buy the dip" where they purchase stocks that have recently fallen in price, respectively (Pagano, Sedunov, and Velthuis 2020). In other words, Robinhood investors did not panic during broad market turmoil during COVID-19 and often used price drops as buying opportunities. However, in aggregate they do not produce an alpha, or "beat the market" by achieving larger-than-average returns (Pagano et al. 2021). Their trades ultimately produce noise in financial markets (Pagano et al. 2021). If all Robinhood investors do is create "noise" in the markets, then the noisiest they've been is when GameStop stock rose–and fell–dramatically in early 2021.

GameStop

In January and February 2021, a handful of stocks experienced an extreme climb in valuation which effectively sky-rocketed the prices of these stocks. These fluctuations were caused by decentralized retail investors acting in concert (Lyócsa, Baumöhl, and Výrost 2021). The largest movement was seen in GameStop which took most of the attention of the saga. Many investors, both individual and institutional, gained and lost significant sums of money. For a full recapping of the sequence of events, I recommend Lopatto (2021) and Regnier (2021).

The GameStop saga provides support for the principle that market forces tend to make markets fair, "where fairness is defined as investors 'getting what they pay for' rather than investors 'beating the market' " due to the apparent misvaluation of GameStop and

other stocks by institutional investors (Macey 2021). On the other hand, the events also cast doubt as to whether the SEC is achieving its stated goal of maintaining "fair, orderly, and efficient markets" (Macey 2021).

The retail investors who caused massive price increased organized on a subforum of the popular website Reddit called "Wall Street Bets," or r/WallStreetBets (Lyócsa, Baumöhl, and Výrost 2021). As a result, the GameStop saga is seen as a battle between Wall Street and small, Robinhood traders who are upset at the unfairness of Wall Street and the stock market. The members of r/WallStreetBets maintained a sense of unity and purpose throughout the events (Muzio 2021). Regardless of whether the organized behavior of r/WallStreetBets users is a political movement, hopeful acts of "sticking it to hedge funds" or something else, they have demonstrated their power to move financial markets (Muzio 2021). However, retail investors as a whole both bought and "shorted"–or bet that GameStop stock was going to go down–indicating that "the Gamestop frenzy was not a pure digital protest against Wall Street but speculative trading by a group of retail investors, in line with their prior high-risk trading behavior" (Hasso et al. 2021).

r/WallStreetBets

Wall Street Bets is a subreddit where investors talk about stocks. The group is known for their risky "YOLO" (You Only Live Once) trades (Muzio 2021). There is a particular language and meme culture that permeates the group and potentially helps to create their culture of "degeneracy" (Boylston et al. 2021). For example, they celebrate people with "diamond hands" as those who are prepared to hold their stocks for a long time and decry "paper hands," those who miss out on profits by selling a stock too early (Wallstreetbets News 2020). They maintain they are not "dumb," but they are "retarded" or "autists." Although these words are derogatory, they use them as a way to self-deprecate and build unity.

Past Research on Information, Media, and Financial Markets

Scholars have been interested in the role of information on financial markets. Business researchers largely operate under the efficient market hypothesis where markets reflect accurate valuations based on available information. As such, they are concerned about whether information being spread about companies is timely or "stale" and the effects of media attention on stocks, including newspaper, television, digital news, and social media.

Newspapers

Even though the role of newspapers play an increasingly receding role in the news ecosystem, media attention given to individual firms via newspapers impact the pricing of the stock. The causal link between newspapers impacting trading prices and volumes was established by leveraging newspaper strikes and observing the subsequent impact on financial markets (Peress 2014). This effect persists for many days after publication, and the impact is prolonged during a recession compared to an expansion (Antweiler and Frank 2006). However, not all coverage is good coverage. Stocks with little or no attention in newspapers earn higher returns than high-media-attention stocks (Fang and Peress 2009).

There are two primary ways to define news: new versus stale and quantitative versus qualitative. Stock market investors respond differently to new versus stale news. New news is when news stories provide original information about a firm. Stale news is when there is additional content, but it does not provide new information. Operationally in studies, new versus stale is defined by the textual similarity of sequential newspaper stories. The prices of stocks respond less to stale news, but there is a reversal in the movement of a stock's price after stale news, suggesting that initial movements are overreactions (Tetlock 2011). Further, quantitative information is easier for news readers to process compared to qualitative information (Engelberg 2008).

In addition, it is not just substantive news about a stock that impacts performance. Stock recommendations in the *Wall Street Journal's* "Dartboard" column, one of the original mass-consumer stock recommendation media, predicted abnormal positive returns of 4% and double the trading volume over the two days after the column recommended a stock (Barber and Loeffler 1993). These market abnormalities are largely driven by naive investors and are ultimately noise in the financial markets. Price movements from the column were reversed within 15 days, and investors following the "expert" recommendations of the column lost 3.8% on a risk-adjusted basis in the six months following the recommendation (Liang 1999). These findings show that media content has a clear relationship with asset prices and should not be seen as a "sideshow." They are also consistent with the theoretical models of retail investors acting as noise in the financial ecosystem. And the findings are inconsistent with the theory that media can serve as a proxy for new financial information that informs the efficient market on fundamental asset valuations (Tetlock 2007).

Television

Similar to newspapers, the financial markets react to media content on television, often in real-time. The live nature of television has shifted academic focus from new versus stale news and instead looks for near-instantaneous market reactions. When the TV program "The Morning Call" on *CNBC* reports analyst views on individual stocks, the market reacts within seconds, the price is fully incorporated within one minute, and trading intensity in the stock doubles within that first minute (Busse and Clifton Green 2002). "Mad Money with Jim Cramer" is a popular *CNBC* television show where the titular host, Jim Cramer, makes a bevy of buy and sell recommendations on stocks. There are significant price movements for stocks that Cramer recommends to buy and sell (Bolster, Trahan, and Venkateswaran 2012; Engelberg, Sasseville, and Williams 2012; Karniouchina, Moore, and Cooney 2009). The effects on the movement of stocks given a "buy" rating from Cramer

are quickly reversed, but the effect persists longer for "sell" recommendations (Bolster, Trahan, and Venkateswaran 2012). The viewing ratings of the show even predict the strength of the price movements (Engelberg, Sasseville, and Williams 2012).

Further, traditional advertising variables, such as message length, recency-primacy effects, information clutter, and source credibility all influence the size of the market reaction to a "buy" recommendation from Cramer (Karniouchina, Moore, and Cooney 2009). These findings suggest that content consumers process media from financial pundits similarly to other types of advertising. Ultimately, these effects show that the investors taking actions from Cramer's recommendations are uninformed traders and not experienced investors receiving any new information (Keasler and McNeil 2010).

Social Media

As evidenced by the recent GameStop and r/WallStreetBets saga, social media is playing an increasing role in the way that individual investors collect, share, and process information that results in investment decisions. The literature on social media and the stock market fall into three broad categories: social media as a predictor of stock movements, crowd-sourced financial recommendations, and behavioral contagion/ herding.

First, social media has been used to try to predict fluctuations in individual stocks. The number of posts on TheRagingBull.com, one of the original stock message boards, in 2001 coincided with days with abnormally high trading volume, but they were not predictive of market pricing or volume after controlling for industry-adjusted returns and normal trading volume (Tumarkin and Whitelaw 2001). This result suggests that some other exogenous events are confounders that drive both social media engagement and stock market volume.

However, other new media, including Yahoo! stock message boards (Das and Chen 2007) and Google Search Volume (Gao 2011) are all predictive of stock movements. Even disagreements on StockTwits, a Twitter-like stock-based social media, predict price changes

by affecting trading done by uninformed investors and facilitates trading by informed traders who are taking actions aimed at changing corporate policies (Cookson, Fos, and Niessner 2021).

Individual tweets just before a firm's quarterly earnings announcement is a predictor of the earnings report and subsequent price action (Mohanram 2018). News diffusion on Twitter leads to lower bid-ask spread and price pressure during a news day, but the effect is reversed the next day (Ye 2016). Twitter, like traditional media, spreads stale news, albeit at a higher speed than traditional media (Ye 2016).

Next, social media have been studied as a way to crowdsource financial advice. For example, Seeking Alpha is a website where non-professional investors can write articles analyzing a stock. Seeking Alpha articles are predictors of stock market movements (Campbell, DeAngelis, and Moon 2019; Chen et al. 2014; Farrell et al. 2018). Estimize is an open platform that solicits forecasts from contributors. These crowdsourced forecasts are incrementally useful in forecasting earnings, and the higher the volume of forecasts, the more accurate the predictions (Jame et al. 2016). SumZero.com is a private social networking site that facilitates interaction and information exchange among professional investors. Recommendations offered on this website generate significant returns in the financial markets (Crawford et al. 2018).

Finally, social media can create "herding" by which there is behavioral contagion that flows through networks of investors via their connections on social media. Social network links increase disposition effects (Heimer 2016), which is the tendency to sell "winning" assets and hold onto "losing" assets (Shefrin and Statman 1985). Herding is particularly prominent on Robinhood (Barber et al. 2021). And the GameStop saga provides evidence for the idea of behavioral contagion among r/WallStreetBets users (Semenova and Winkler 2021). On StockTwits there is even evidence of echo chambers where users selectively expose themselves to other users who share positive or negative sentiments on specific stocks (Cookson, Engelberg, and Mullins 2020). The herding behavior found in online in-

vestor communities also happens in offline networks (Duflo and Saez 2002, 2003; Ivković and Weisbenner 2007; Musciotto et al. 2018; Shiller and Pound 1989). Potentially, this similarity between online and offline social behavioral contagion can add to the digitization and social network literature.

Conclusion & Future Research

The relationship between media, information, and the stock market is well-studied. Financial market scholars have intensely studied the impact that media and information have on driving the prices of financial securities higher and lower. However, approaching the topic from a media psychology angle provides new questions and avenues of study. A psychological approach places individual investors as the unit of analysis, not the movements of financial markets.

Temporal dynamics of stock information

It is unclear at what time intervals individual investors make trading decisions. How long do retail investors take before purchasing a stock? Do different types of information from sources of varying credibility impact the scale of time in making a decision? Taking a Lemkeian approach (2000) to understanding the temporal dimension of investment decisions could help to answer these questions.

Gamification and design

Another area of future research is how the design of media and trading platforms impacts financial decisions. There has been a lot of speculation on how Robinhood's gamified interface spurs more and riskier trades. How does the design of financial platforms and financial media alter trading behaviors?

Addiction, escapism, and video games

How is addiction to trading stocks similar or different than addiction to other media, like video games where there is a constant feedback loop of "winning" and "losing" (Bavelier et al. 2011)? Do people trade stocks and consume financial information as a means of "escaping" and taking on a persona as a big-time trader, just like video games are used for escapism (Granic, Lobel, and Engels 2014; Reeves and Read 2009)?

Social contagion

How does trading behavior spread across networks of people? We know that behavior does spread, but media psychologists can help answer *how*, similar to studies on emotional contagion in social networks (Kramer, Guillory, and Hancock 2014). Past research has focused on aggregated groups of people, for example working in the same office or in the same geographic area (Duflo and Saez 2002, 2003; Ivković and Weisbenner 2007; Musciotto et al. 2018; Shiller and Pound 1989). Semenova and Winkler (2021) provide a good start on modeling individual trading decisions within digital networks, but how can media psychologists add their knowledge of interpersonal dynamics to mathematical modeling of behavioral contagion?

Media fragmentation and information gathering

Finally, digital technologies have fragmented the media experiences of users. Instead of sitting down at one's computer and intensely trading stocks, many users now pull up a trading app on their phone and casually trade. Are most people using the Robinhood app for hours at a time? Unlikely, instead, it is more probable that there is media fragmentation that causes multitasking or task switching which creates short bursts of attention given to a trading app intertwined with other media. Can interacting with other types of media impact how one trades? Does trading behavior impact the other media that a trader consumes? How do traders respond to massive financial gains and losses, either

of the entire market or their individual portfolio, similar to the study of individuals' responses to television imagery (Newhagen and Reeves 1992)? How do people even go about getting information to make a trading decision? How is trust built between someone like Jim Cramer or a random Reddit user and investors? All of these questions remain unanswered.

Conclusion

Scholars of financial markets have intensely studied the psychology of investing and personal finance. They have also studied relationships between media and financial markets. But all of their research questions revolve around studying the market as the outcome. Media psychologists can add to this area of research by studying individual behavior as the dependent variable.

References

Antweiler, Werner, and Murray Z. Frank. 2006. "Do Us Stock Markets Typically Overreact to Corporate News Stories." In.

Barber, Brad M., Xing Huang, Terrance Odean, and Christopher Schwarz. 2021. "Attention Induced Trading and Returns: Evidence from Robinhood Users." *Available at SSRN: Https://Ssrn.com/Abstract=3715077 or Http://Dx.doi.org/10.2139/Ssrn.3715077*.

Barber, Brad M., and Douglas Loeffler. 1993. "The "Dartboard" Column: Second-Hand Information and Price Pressure." *The Journal of Financial and Quantitative Analysis* 28 (2): 273–84. http://www.jstor.org/stable/2331290.

Bavelier, Daphne, C. Shawn Green, Doug Hyun Han, Perry F. Renshaw, and Michael M. Merzenich. 2011. "Brains on Video Games." *Nature Reviews Neuroscience* 12 (November): 763–68. https://doi.org/https://doi.org/10.1038/nrn3135.

Bolster, Paul, Emery Trahan, and Anand Venkateswaran. 2012. "How Mad Is Mad Money? Jim Cramer as a Stock Picker and Portfolio Manager." *The Journal of Investing* 21

(2): 27–39. https://doi.org/10.3905/joi.2012.21.2.027.

Boylston, Christian, Beatriz Palacios, Plamen Tassev, and Amy Bruckman. 2021. "WallStreetBets: Positions or Ban." http://arxiv.org/abs/2101.12110.

Busse, Jeffrey A., and T. Clifton Green. 2002. "Market Efficiency in Real Time." *Journal of Financial Economics* 65 (3): 415–37. https://doi.org/https://doi.org/10.1016/S0304-405X(02)00148-4.

Campbell, John L., Matthew D. DeAngelis, and James R. Moon. 2019. "Skin in the game: personal stock holdings and investors' response to stock analysis on social media." *Review of Accounting Studies* 24 (3): 731–79. https://doi.org/10.1007/s11142-019-09498-.

Chen, Hailiang, Prabuddha De, Yu (Jeffrey) Hu, and Byoung-Hyoun Hwang. 2014. "Wisdom of Crowds: The Value of Stock Opinions Transmitted Through Social Media." *The Review of Financial Studies* 27 (5): 1367–1403. https://doi.org/10.1093/rfs/hhu001.

Cookson, J. Anthony, Joseph E. Engelberg, and William Mullins. 2020. "Echo Chambers." *SocArXiv1*, June. https://doi.org/doi:10.31235/osf.io/n2q9h.

Cookson, J. Anthony, Vyacheslav Fos, and Marina Niessner. 2021. "Does Disagreement Facilitate Informed Trading? Evidence from Activist Investors." *Available at SSRN: Https://Ssrn.com/Abstract=3765092 or Http://Dx.doi.org/10.2139/Ssrn.3765092*.

Crawford, Steven, Wesley Gray, Bryan R. Johnson, and Richard A. Price. 2018. "What Motivates Buy-Side Analysts to Share Recommendations Online?" *Management Science* 64 (6): 2574–89. https://doi.org/10.287/mnsc.2017.2749.

Das, Sanjiv R., and Mike Y. Chen. 2007. "Yahoo! for Amazon: Sentiment Extraction from Small Talk on the Web." *Management Science* 53 (9): 1375–88. https://doi.org/10.1287/mnsc.1070.0704.

Duflo, Esther, and Emmanuel Saez. 2002. "Participation and investment decisions in a retirement plan: the influence of colleagues' choices." *Journal of Public Economics* 85 (1): 121–48. https://ideas.repec.org/a/eee/pubeco/v85y2002i1p121-148.html.

———. 2003. "The Role of Information and Social Interactions in Retirement Plan

Decisions: Evidence from a Randomized Experiment*." *The Quarterly Journal of Economics* 118 (3): 815–42. https://doi.org/10.1162/00335530360698432.

Engelberg, Joseph. 2008. "Costly Information Processing: Evidence from Earnings Announcements." *AFA 2009 San Francisco Meetings Paper*, January. https://doi.org/http://dx.doi.org/1

Engelberg, Joseph, Caroline Sasseville, and Jared Williams. 2012. "Market Madness? The Case of "Mad Money"." *Management Science* 58 (2): 351–64. http://www.jstor.org/stable/41406393.

Fang, Lily, and Joel Peress. 2009. "Media Coverage and the Cross-Section of Stock Returns." *The Journal of Finance* 64 (5): 2023–52. https://doi.org/https://doi.org/10.1111/j.1540-6261.2009.01493.x.

Farrell, Michael, T. Clifton Green, Russell Jame, and Stanimir Markov. 2018. "The Democratization of Investment Research and the Informativeness of Retail Investor Trading." *Available at SSRN: Https://Ssrn.com/Abstract=3222841 or Http://Dx.doi.org/10.2139/Ssrn.3222841*.

Gao, Zhi Da; Joseph Engelberg; Pengjie. 2011. "In Search of Attention." *The Journal of Finance* 66 (5): 1461–99. https://doi.org/https://doi.org/10.1111/j.1540-6261.2011.01679.x.

Granic, I., A. Lobel, and R. Engels. 2014. "The Benefits of Playing Video Games." *The American Psychologist* 69 1: 66–78.

Hasso, Tim, Daniel Müller, Matthias Pelster, and Sonja Warkulat. 2021. "Who Participated in the Gamestop Frenzy?" *TAF Working Paper No. 58*, February.

Heimer, Rawley Z. 2016. "Peer Pressure: Social Interaction and the Disposition Effect." *The Review of Financial Studies* 29 (11): 3177–3209. https://doi.org/10.1093/rfs/hhw063.

Ivković, Zoran, and Scott Weisbenner. 2007. "Information Diffusion Effects in Individual Investors' Common Stock Purchases: Covet Thy Neighbors' Investment Choices." *The Review of Financial Studies* 20 (4): 1327–57. https://doi.org/10.1093/revfin/hhm009.

Jame, Russell, Rick Johnston, Stanimir Markov, and Michael C. Wolfe. 2016. "The Value of Crowdsourced Earnings Forecasts." *Journal of Accounting Research* 54 (4): 1077–

1110. https://doi.org/https://doi.org/10.1111/1475-679X.12121.

Kannadhasan, M. 2015. "Retail Investors' Financial Risk Tolerance and Their Risk-Taking Behaviour: The Role of Demographics as Differentiating and Classifying Factors." *IIMB Management Review* 27 (3): 175–84. https://doi.org/https://doi.org/10.1016/j.iimb.2015.06.004.

Karniouchina, Ekaterina V., William L. Moore, and Kevin J. Cooney. 2009. "Impact of "Mad Money" Stock Recommendations: Merging Financial and Marketing Perspectives." *Journal of Marketing* 73 (6): 244–66. http://www.jstor.org/stable/20619072.

Keasler, Terrill, and Chris McNeil. 2010. "Mad Money stock recommendations: market reaction and performance." *Journal of Economics and Finance* 34 (1): 1–22. https://doi.org/10.1007/s12197-008-9033-7.

Kramer, Adam D. I., Jamie E. Guillory, and Jeffrey T. Hancock. 2014. "Experimental Evidence of Massive-Scale Emotional Contagion Through Social Networks." *Proceedings of the National Academy of Sciences* 111 (24): 8788–90. https://doi.org/10.1073/pnas.1320040111.

Lemke, Jay L. 2000. "Across the Scales of Time: Artifacts, Activities, and Meanings in Ecosocial Systems." *Mind, Culture, and Activity* 7 (4): 273–90. https://doi.org/10.1207/S15327884MCA0704/_03.

Liang, Bing. 1999. "Price Pressure: Evidence from the "Dartboard" Column." *The Journal of Business* 72 (1): 119–34. https://doi.org/10.1086/209604.

Lopatto, Elizabeth. 2021. "How R/Wallstreetbets Gamed the Stock of Gamestop." *The Verge*, January. https://www.theverge.com/22251427/reddit-gamestop-stock-short-wallstreetbets-robinhood-wall-street.

Lyócsa, Štefan, Eduard Baumöhl, and Tomáš Výrost. 2021. "YOLO Trading: Riding the Herd During the Gamestop Episode." *ZBW - Leibniz Information Centre for Economics, Working Paper*. http://hdl.handle.net/10419/230679.

Macey, Jonathan R. 2021. "Securities Regulation as Class Warfare." *Columbia Business*

Law Review, Forthcoming, February. https://doi.org/http://dx.doi.org/10.2139/ssrn.3789706.

Mohanram, Eli Bartov; Lucile Faurel; Partha S. 2018. "Can Twitter Help Predict Firm-Level Earnings and Stock Returns?" *The Accounting Review* 93 (3): 25–57. https://doi.org/https://doi.org/10.2308/accr-51865.

Musciotto, Federico, Luca Marotta, Jyrki Piilo, and Rosario N. Mantegna. 2018. "Long-Term Ecology of Investors in a Financial Market." *Palgrave Communication* 4 (1): 92.

Muzio, Tim Di. 2021. "GameStop Capitalism. Wall Street Vs. The Reddit Rally (Part 1)." *University of Wollongong Working Paper*, 1–13. http://bnarchives.yorku.ca/673/.

Newhagen, John E., and Byron Reeves. 1992. "The Evening's Bad News: Effects of Compelling Negative Television News Images on Memory." *Journal of Communication* 42 (2): 25–41. https://doi.org/https://doi.org/10.1111/j.1460-2466.1992.tb00776.x.

Pagano, Gregory W., Clifton T. Green, Brian Roseman, and Yanbin Wu. 2021. "Zero-Commission Individual Investors, High Frequency Traders, and Stock Market Quality." *Available at SSRN: Https://Ssrn.com/Abstract=3776874 or Http://Dx.doi.org/10.2139/Ssrn.3776874*, January. https://doi.org/http://dx.doi.org/10.2139/ssrn.3776874.

Pagano, Michael S., John Sedunov, and Raisa Velthuis. 2020. "How Did Retail Investors Respond to the Covid-19 Pandemic? The Effect of Robinhood Brokerage Customers on Market Quality." *Finance Research Letters, Forthcoming*, November. https://doi.org/http://dx

Peress, Joel. 2014. "The Media and the Diffusion of Information in Financial Markets: Evidence from Newspaper Strikes." *The Journal of Finance* 69 (5): 2007–43. https://doi.org/https://doi.org/10.1111/jofi.12179.

Reeves, Byron, and J. L. Read. 2009. "Total Engagement: Using Games and Virtual Worlds to Change the Way People Work and Businesses Compete." In.

Regnier, Pat. 2021. "Stonks Are Bonkers, and Other Lessons from the Reddit Rebellion." *Bloomberg.com*, February. https://www.bloomberg.com/news/features/2021-02-04/gamestop-gme-how-wallstreetbets-and-robinhood-created-bonkers-stock-market.

Semenova, Valentina, and Julian Winkler. 2021. "Reddit's Self-Organized Bull Runs."

Available at Https://Mpra.ub.uni-Muenchen.de/105630/.

Shefrin, Hersh, and Meir Statman. 1985. "The Disposition to Sell Winners Too Early and Ride Losers Too Long: Theory and Evidence." *The Journal of Finance* 40 (3): 777–90. https://doi.org/https://doi.org/10.1111/j.1540-6261.1985.tb05002.x.

Shiller, 021Robert J., and John Pound. 1989. "Survey evidence on diffusion of interest and information among investors." *Journal of Economic Behavior & Organization* 12 (1): 47–66. https://ideas.repec.org/a/eee/jeborg/v12y1989i1p47-66.html.

Talwar, Manish, Shalini Talwar, Puneet Kaur, Naliniprava Tripathy, and Amandeep Dhir. 2021. "Has Financial Attitude Impacted the Trading Activity of Retail Investors During the Covid-19 Pandemic?" *Journal of Retailing and Consumer Services* 58: 102341. https://doi.org/https://doi.org/10.1016/j.jretconser.2020.102341.

Tetlock, Paul C. 2007. "Giving Content to Investor Sentiment: The Role of Media in the Stock Market." *The Journal of Finance* 62 (3): 1139–68. https://doi.org/https://doi.org/10.1111/j.1540-6261.2007.01232.x.

———. 2011. "All the News That's Fit to Reprint: Do Investors React to Stale Information?" *The Review of Financial Studies* 24 (5): 1481–1512. https://doi.org/10.1093/rfs/hhq141.

Tumarkin, Robert, and Robert F. Whitelaw. 2001. "News or Noise? Internet Postings and Stock Prices." *Financial Analysts Journal* 57 (3): 41–51. https://doi.org/10.2469/faj.v57.n3.2449.

Wallstreetbets News. 2020. "Dissecting the Unique Lingo and Terminolgy Used in the Subreddit R/Wallstreetbets." %22https://www.wallstreetbets.shop/blogs/news/dissecting-the-unique-lingo-and-terminology-used-in-the-subreddit-r-wallstreetbets%22.

Welch, Ivo. 2020. "The Wisdom of the Robinhood Crowd." *NBER Working Paper Series*, September. http://www.nber.org/papers/w27866.

Ye, Nitesh Chawla; Zhi Da; Jian Xu; Mao. 2016. "Information Diffusion on Social Media: Does It Affect Trading, Return, and Liquidity." *Available at SSRN: Https://Ssrn.com/Abstract=2935138*

or Http://Dx.doi.org/10.2139/Ssrn.2935138.