Retail investors and media psychology

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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	2963	2987
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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 psychological motivators of

investing 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, gamification of 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 et al., 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 et al., 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 et al., 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 et al., 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 members are 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 plays an increasingly receding role in the news ecosystem, media attention given to individual firms via newspapers impacts 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 & 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 & 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 & 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).

While business scholars strictly look for how media content can drive the price of stocks higher or lower, media psychologies also study the psychological effects of content. For example, media psychologists study the visceral effects of encountering violent news stories or pornography. A similar approach can be taken to studying financial news and positive versus negative stories of firms.

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 in-

tensity in the stock doubles within that first minute (Busse & 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 et al., 2012; Engelberg et al., 2012; Karniouchina et al., 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 et al., 2012). The viewing ratings of the show even predict the strength of the price movements (Engelberg et al., 2012).

Business scholars and media psychologists take fundamentally different approaches to studying television. Business scholars examine discrete pieces of media in a vacuum– there is little consideration for broader media ecology or content that is consumed before or after the specific media content being studied. In the case of television, business scholars will study a specific segment on television without concern for the content before or after the specific segment. In contrast, media psychologists study the increasing fragmentation of the media landscape. The information just before a television segment can prime the media consumer. Or, a television watcher can take out their cell phone and look at related content while a media segment is ongoing. Business scholars do not consider any of these media consumption realities. Perhaps, controlling for these other factors can reveal an even stronger effect of media on the prices of stocks.

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 falls 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 & 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 & 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 et al., 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 et al., 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 & 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 & 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 et al., 2020). The herding behavior found in online investor communities also happens in offline networks (Duflo & Saez, 2002, 2003; Ivković & Weisbenner, 2007; Musciotto et al., 2018; Shiller & Pound, 1989). Potentially, this similarity between online and offline social behavioral contagion can add to the digitization and social network literature.

Herding behavior is very similar to how media psychologists have found social norms to impact behavioral change. For example, making people believe that all of their neighbors are recycling, an individual is more likely to also recycle. Similarly, if an investor in an online community perceives that everyone is purchasing GameStop stock, they are likely to also participate in that newly-perceived social norm.

Conclusion & Future Media Psychology Research

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 et al., 2014; Reeves & 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 et al., 2014). Past research has focused on aggregated groups of people, for example working in the same office or in the same geographic area (Duflo & Saez, 2002, 2003; Ivković & Weisbenner, 2007; Musciotto et al., 2018; Shiller & 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 & 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.

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