

From Main Street to Wall Street: Analysis of Retail Trading Power After the GameStop Squeeze

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ABSTRACT

Social media can be used as a tool to help investors gather and disseminate information about the stock market. However, this tool also presents opportunities for market manipulation through mass coordination that many retail traders use to gain an advantage over more prominent market participants. Analyzing millions of mentions sent on the social media platform Reddit in r/WallStreetBets, we found that an abnormally higher number of mentions is associated with a price and volume increase of the security. Examining these dependent variables through a descriptive and correlational study through the years, along with mentions in various sized companies, we found that smaller to larger-sized companies retained and increased some retail influence through the evolution of the pump-and-dump tactics, while the general market (ETFs) had zero to no real longterm retail influence. Our findings indicate an evolution to modern-day market structure as retail traders have increased long-term power in the market, though limited in their effect on the whole market.

Introduction

Retail traders have mostly been considered to retain an insignificant impact on the overall financial and market structure. Their choices, driven by irrational emotions rather than analytical data, make them stand out from the market. These irrational choices have always been under the radar as their effects were minimal due to the limited capital the "small guys" (retail traders) had compared to the "big guys" (investment bankers and hedge funds). However, this non-threatening and "powerless" picture of noise investors has completely changed. Retail investors now have expanded access to free market resources/tools and more accessible communication through Direct-Access Information Technologies (DAITs), allowing for more coordination and retail capital. The most striking and prominent example is the short squeeze of GameStop (GME), which retail investors triggered by coordinating on a SubReddit called WallStreetBets (Anand & Pathak, 2021).

Reddit is a social media website that is a user-promoted discussion forum that allows users to decide the importance of content through upvoting and downvoting systems. Specifically, the /WallStreetBets community used this website to coordinate and promote their strategy to the rest of the members and eventually the world to squeeze GME. GameStop is a retail company mainly focusing on the tech sector by selling gaming equipment and games. This company, through the 2020 pandemic, was shorted by large investment firms and bankers like Melvin Capital in interest to cover their losses throughout the stock market drop during the pandemic. R/WallStreetBets would expose this safe cover as retail traders realized and saw the increased shorts/short-interest in the GameStop stock, which they would take advantage of through countering short-sellers.

Short-selling is a strategy when a person (in this case, an investment firm) borrows a stock in the hope that the stock goes down. They borrow this stock from a brokerage and then sell it on the open market, hoping it will go down so they can repurchase it at a lower price, allowing them to pocket the difference. This strategy allowed people to essentially bet on the downfall of a GME, as they bet for the stock price to plummet. This strategy, however, has some limitations, as the underlying price of the stock limits the profit. However, the possible downside is technically unlimited as stock can only go as low as zero but as high as it wants. Now, large investment firms like Melvin Capital,

according to McCrank, took a large short against GME, leading to GME having a short interest of over 140%, meaning that more shares were being shorted than existing shares. Many investors in the r/wallstreetbets Reddit saw this, eventually coordinating buys to punish the "Wall Street Big Boys" (McCrank, 2021). These coordinated investments in stock propelled the price of GME up and up, leaving these short sellers (big investment firms) to rack up 2.5 billion in losses in a couple of days, according to data and analytics firm S3 Partners (Smith, 2021). To cut losses, these investment firms had to buy Gamestop shares to cover their losses; however, buying shares would increase the price even more and increase their losses. This inevitable unwinnable cycle made these firms lose more money the higher the stock price, and the only way to cover themselves was to buy more shares, which would increase the price. This ability to manipulate prices through volume led retail investors to gain power in the stock market as they could coordinate designated stock pumps to increase their designed stock prices dramatically.

Retail investors then used options to leverage their trades, further hurting these firms. Retail traders bought call options on GME, which allowed them to buy 100 shares for a limited time for a fraction of the stock's price from a market maker. The market maker defines the strike price (the price where the contract made money when it expired) in the contract and allows investors to buy and sell these options. These market-maker contracts allowed retail investors to leverage large amounts of money (thousands) for just hundreds of dollars, expanding retail traders' capital as the intrinsic value of these options increased exponentially once getting closer to the strike price (Panda, 2021). This increase in value for these options created an issue for market makers as they had to hedge the risk in case the strike price was hit or the stock exceeded that price resulting in a gamma squeeze and higher premiums on those contracts. Many of these market makers hedge by buying the stock and doing covered calls (buying the stock to protect themselves from losses). The ability to get OTM (out of the money) options allowed Redditors to coordinate option buying, so market makers had to buy the stock too in large volume (Ahmed, 2021). With high leverage, prices increased drastically. This gamma squeeze was the spark that lit a conflagration in the short squeeze and gave noise traders overwhelming control in GME, and hijacked the market for several days, leading to GME prices surging by over 1500% in two weeks (US Securities and Exchange Commission, 2021).

The coordinated use of social media gave retail traders a new sense of increased power during the GME Squeeze. They now had the chance to coordinate and strategize targeted attacks against these market makers and large firms with more capital from large amounts of leverage. However, this new, relatively new ability to influence the market has been limited to this scenario. It has not been categorized to understand retail traders' market power directly.

Literature Review

Social media and the networks it creates profoundly affect the financial market's functioning. One of the changes from this social media moment is the growing significance of retail traders in the stock market. In the standard market microstructure model explained by Glosten and Milgrom (Kyle, 1985; Glosten & Milgrom, 1985), noise traders, or in this case, retail traders, were not considered in the grand scheme of the market. Due to their randomness and the limited amount of capital available to them, retail traders were not able to contribute to the market in a significant way. Moreover, even if they made a meaningful contribution, this contribution is usually extremely short-term and insignificant as many market instruments will pressure back prices to their original price.

The Growing Impact of Retail Investors

One of the first models to highlight the importance of these relatively ignored communities in the financial markets is described by De Long and his colleagues, where his studies concluded that noise trader's illogical erroneous stochastic beliefs do impact the greater market in a significant way, as these irrational traders led to other traders avoiding a particular company/stock (De Long et al., 1990). These retail trader attitudes would result in the company's stock prices being different from their fundamentals as whales would be deterred from some stocks due to the inert risk of volatility

from investing in retail stocks. This Study highlighted that even when seemingly perceived as irrelevant in the financial ecosystem, retail traders influenced big money in the market, allowing them to impact price levels and formation in certain instances effectively.

Low-cost online trading platforms, the growth of stock communities on social media, and the ease of access to the financial markets have made it easier for retail traders to adjust their power structures. As Zheludev et al. (2014) pointed out, the expansion of the internet has improved the ability for traders to interact with each other. People no longer had to go to Wall Street to trade correctly, as all the resources needed could be implemented online. This ability for resources and information on the markets to spread quickly would open up more resources for the average investor.

Pedersen (2021) proposes a newer model to expand upon Glosten and Milgrom models, which accounts for this now easily accessible information that retail traders can now receive with the internet and social media. He introduces two new investors: the fanatics (stubborn investors with "diamond hands") and naive investors (investors learning and relying on social media for proposed investing strategies). These new investor types proposed by Pedersen would have allowed GME to soar to incredible heights as retail investors could now leverage people on social media to buy GME and hold GME when it hit its lows.

The Role of Sentiment Control

The use of social media has been a relatively easy way to promote opinions and the news of stocks due to its real-time nature. In a case study done on the effect of Twitter on stocks, Twitter was found to correlate with the number of tweets and the price of a stock during that same day. The study used various market-wide indicators to examine the stock market, sector, and company stock levels. A high correlation was found predominantly at the Company stock level compared to the other levels, as the number of tweets and the trading volume showed a strong correlation (Mao et al., 2012). This correlation was a critical factor that allowed GME to boom, and retail traders could control the stock volume and ensure that GME volume continued to hold up through social media. The study fails to create the volume that the company stock provided to a direct increase or decrease. This lack of correlation and evidence of correlation reduces the effects that volume control can have. Even though this is the case, the targeting of one company, especially the, in particular, GME allowed retail traders to push the squeeze to happen, directing more capital and more attention into one company instead of trying to push up an entire sector or market.

This vast control of social media sentiment, like on Twitter and other platforms, allowed these retail traders to grow the movement indirectly as popular press (social-media platforms). In a study done by Chen et al. building upon Mao's findings by looking at both traditional media and social media effects on the market, they found that social-media sentiment closely correlates with subsequent stock returns even after controlling for traditional media, and the media effect is more substantial for companies held by retail traders (Chen et al., 2011). These findings highlight the importance of social media on sentiment control as it allowed retail traders to control the views of GME, allowing them to promote other retail traders in buying GME, ultimately leading to the squeeze.

Tactics

The retail traders also used different tactics for the GME squeeze to reach its desired levels. In Renault (2018), the author mainly focuses on how retail traders use different tactics to manipulate. One of these ways that retail traders use their power is a tactic called a pump and dump. This "pump-in dump" uses social media to coordinate specific times when to buy and when to sell a stock. The Study found that these pumps and dumps, which started with abnormal mentions of stock on social media, would lead to a sharp increase in volume and a substantial price increase.

In addition to this, retail investors used a strategy called "Yolo Trading." This strategy, pointed out by Lycosa (2022), would put investors in a high-risk and high-reward situation as most or not all of their money would be put into one stock. This Study which looked at the Google trends of 4 different retail heavy companies, showed that the

"YOLO Trading" strategy helped these stocks gain prices. This strategy builds upon Renault's earlier Study highlighting how retail traders can use different methods via communication on social media to get what they want in a trading and the overall markets.

The Lasting Impact of GME Squeeze

Retail trading has been seen as the outlier in the financial markets and is usually seen as unable to affect anything. With the GameStop squeeze, this ability to move markets has changed in recent years for retail traders. Social media helped bring communities of retail traders to grow their power in numbers. This wide access has allowed retail traders to finally have a considerable effect on the markets as they could control a stock's sentiment and overall narrative through social media. The ability to control stock mentions (popularity) allowed more capital than ever to flow inside GME, allowing one of history's biggest squeezes to happen.

With the rise of social media in the markets, it is essential to understand how social media played a significant role in the GME squeeze. However, further research is needed on the lasting effects of these new traders and if these traders can influence the market for long periods.

Methodology

I used a descriptive and correlational quantitative research method to determine the effects of social media on the power of retail traders, especially long-term ones, in the American stock market. In particular, I did a descriptive research method and a correlational study that uses custom code to examine the volume and mentions of the stock on social media. This data, partnered with the stocks' historical prices, allowed me to compare prices directly to mentions on r/wsb and understand how these retail traders making these mentions genuinely affect the market's long-term.

The first part of my research involved looking at stocks before the main GME squeeze around a year. This analysis before the squeeze allowed me to understand how retail traders affected these stocks more comprehensively. It would add a control group to my research and allow me to compare changes after the GME squeeze to understand the retail power in these stocks. To further ground my research, I used additional stocks with varying market caps (over and under 100 billion) to better understand how social media affects the whole market, not just smaller-cap stocks. Then I looked at these various stocks' impact during that main GME squeeze in 2021. After that, I looked at the essential part of my research, after the main GME pump. I measured just shy of a year to the present day (late 2023) to see if retail power on these stocks has changed.

Stock Picks

In order to pick stocks to use for the research, a website called MarketBeat was primarily used. This website allowed me to look at the most mentioned stocks during the GME squeeze. These stocks, which had the most mentions during the squeeze, according to Weiss (2023), were ideal for research as they would have a large amount of data already available. Because of this, a more direct comparison could easily be made on the long-term retention of retail traders to these stocks. This understanding of retention would be seen in the change of prices, mentions, and the volume of a stock which would answer if retail traders had a long-term effect on the market. To better understand the power dynamic of the whole market, more stocks were added to the Study; Six stocks were chosen to vary in market cap (small cap, mid cap, large cap, ETF). This varying size helped answer the gap in understanding retail traders' power, as more expensive cap stocks are harder to move (require more power), allowing a more comprehensive placement of retail traders' power in the overall market structure. Other than market cap, these stocks will be in different sectors to ensure that sector-specific news does not skew the overall results of the research. The stock choices from the latter requirements are presented in Table 1.

Table 1

Variety of Stocks used in Study and their information

Stocks (Ticker)	Ticker	MKT Cap	Industry
GameStop (GME)	GME	\$268M	Electronics Distribution
AMC Entertainment Holdings (AMC)	AMC	\$391M	Entertainment
Palantir* (PLTR)	PLTR	\$16.5B	Software/Govt
Tesla (TSLA)	TSLA	\$139.6B	Automotive
Apple (AAPL)	AAPL	\$1.2T	Technology
SPDR S&P 500 ETF (SPY)	SPY	\$21.4T	All

¹MKT CAP numbers are from February 3rd, 2020, except for Palantir*, which was taken at its IPO date, September 30th, 2020.

Gathering Data

To measure the power of the retail traders, I used the Bloomberg API to extract information such as stock price, price change (open/close), and volumes to understand these stocks' behavior fully. To this, I extracted data from Bloomberg on the intraday scale to capture the outlook of days, reducing the amount of exported data while giving a clear picture of the effect mentions have on the various stocks. I used custom code based on Java and its libraries to extract historical data. I created a session with the Bloomberg API with the designated API host/port number from Bloomberg to do this. After the session was created, I used the //blp/refdata service to access the API-provided data on the designated session. After this, the program requests the object for the historical data and specifies the parameters like start and end date. Once done, the program subscribes to the request and adds an event handler to the created sessions. The program then extracts the necessary data for the project, like volume, opening, and close, and then prints it. I also looped through this program various times to gather data for multiple stocks. Once this data was received, I put it in an Excel sheet to help organize it. A flow chart is provided below to explain this process better.

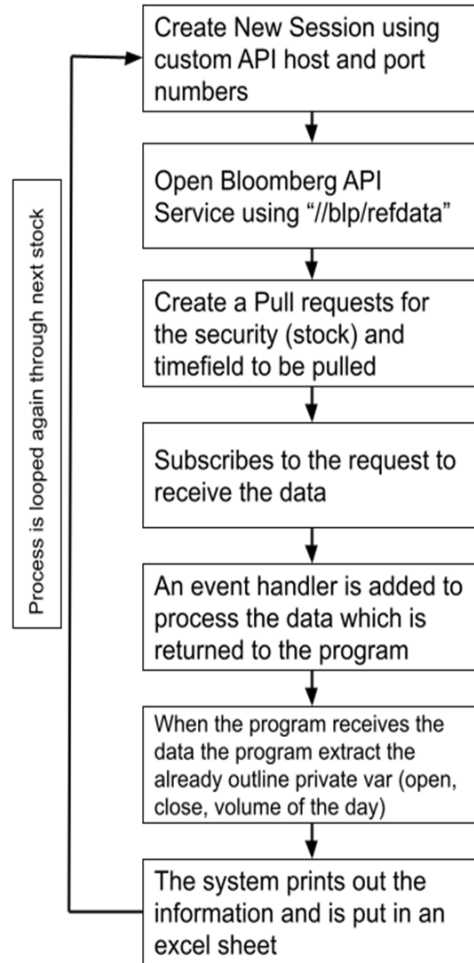


Figure 1. Sample Flowchart for Gathering Stock Data (Volume, Open, Close Volume) from

I did a similar thing for Reddit to gather the mentions of stock tickers on r/wsb using the Reddit API. Following Renault (2018), I mimicked parts of how he gathered mentions data on Twitter and implemented it on Reddit. I did this first using OAuth 2.0 protocol to use Reddit API (receive data). I then used Jraw (a built-in Java library) to extract the dates. I then used the Java library `java.util.regex` and specified only titles to count only the number of occurrences/mentions. I also limited this to one per post to understand the number of posts containing certain stocks and avoid random spam of certain accounts, which could mess with the results. Then I used the Java map function to group the occurrences by date and finally returned to the console, which was also copied into the Excel sheet. This code is also explained better through the flowchart below.

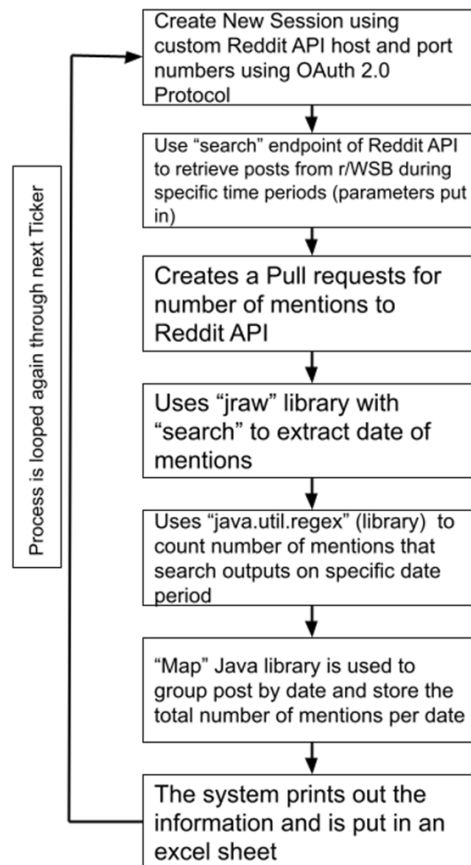


Figure 2. Sample Flowchart of Gathering Mentions From Reddit's subReddit WallStreetBets

After extracting the necessary data, I compiled this data to create this new data that outlined the impact retail trading has had on the market over an extended timeframe. This dataset that was extracted, even though it comes from historical data, was put together and organized to compare all the various dependent variables during the different times to find patterns over time. By expanding this research through the years, I found the long-term impacts of retail traders and hence their power.

Data Implementation

After collecting this data from these APIs, I found the percent change for the day of all the days I recorded. I did this by finding the rate of change (ROC) from open to close daily and implementing the formula for each cell. This way of finding ROC allowed me to compare stock price moves concerning its fixed inter-day price.

Equation 1: Stock price movement in percentage during certain time periods. Mainly used to find intraday percentage.

$$ROC = \left(\frac{Close\ Price[p] - Close\ Price[p - n]}{Close\ Price[p - n]} \right) \times 100$$

Once I found this, I used Excel to formulate this extracted data and organize it into graphs to see if a pattern exists easily. Because Renault's (2018) and Mao et al. (2012) findings already highlighted a correlation between the mentions, price, and volume, I did not put these variables directly against each other as it would be repetitive. Instead, I put all these variables on a single graph for each stock to see if any patterns can be observed over the years and if the longevity shows contrasting results. I did this process for each stock already selected for this research. I mainly looked at before, during, and after the GME squeeze to see the difference in these patterns. These graphs had time set as the independent variable and have above-average mentions, volume, and price as dependent variables. Switching from using all mentions to just above average mentions was necessary for this long-term Study as it removes most of the casual discussion and highlights the times the retail is actively pushing to pump the stock price. The three y-axis graphs showed if any pattern or correlation can be seen through the three years. This multi-axis graph is necessary to show any relationships between all three variables to understand if retail mentions of Reddit impact the market comprehensively. Multiple graphs with just one y-axis would be insufficient as it would impede the whole market picture and would not as quickly highlight patterns between these variables and mentions.

In order to directly measure the retail trading power and if it has increased, decreased, or stayed the same over the years, I found the correlation of above-average mentions to daily price changes (ROC) during the bull runs of each period. In order to find the correlation between these two variables, I used the Pearson correlation coefficient equation seen below by using the CORREL function in Excel, which had been used in studies to highlight the effects on the stock price on shorter timelines. This way of measuring the correlation has already been used by Lyócsa et al. (2021), Mao et al. (2012), and Smith (2021) to find the power of retail influence during shorter periods of time

Equation 1: Correlation Formula

$$r = \frac{\sum (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum (x_i - \bar{x})^2 \sum (y_i - \bar{y})^2}}$$

This equation was used to directly highlight the correlation of mentions above average to increase in price before, during, and after the GME Squeeze to see if mentions impact not only the stock but to what degree through the return r, the correlation coefficient. As mentioned, an r higher r value would show increased retail power in the stock market, significantly affecting stock prices over time. I also found the average length of bullish runs by simply finding all the bullish runs in the dataset for each stock and dividing it by days of the period to highlight the longevity of retail power during the different periods to see if Retail traders' influences are shortening or getting longer. I put all these values in a chart and compared them among both periods and sectors to see if they compare them. This data allowed Retail Traders to be categorized on their power in the markets, seeing if they genuinely have a real influence in the stock markets.

Results

A Preliminary examination of the GME dataset revealed a distinct pattern shaped like a trapezoid in the volume variable through graphing all variables of a single stock on Excel. This pattern was mainly seen during and after the GME squeeze and would start with an above-average mention (spike in mentions) which would follow in a gradual increase of volume and price over days or weeks, a stock run. This process would eventually end in a spike in mentions leading to a dramatic decrease in volume and a dump in stock price before it cycled and repeated itself. This cycle is best seen from 6/9/2021-10/9/2022, where this process is repeated multiple times in the GameStop Stock.

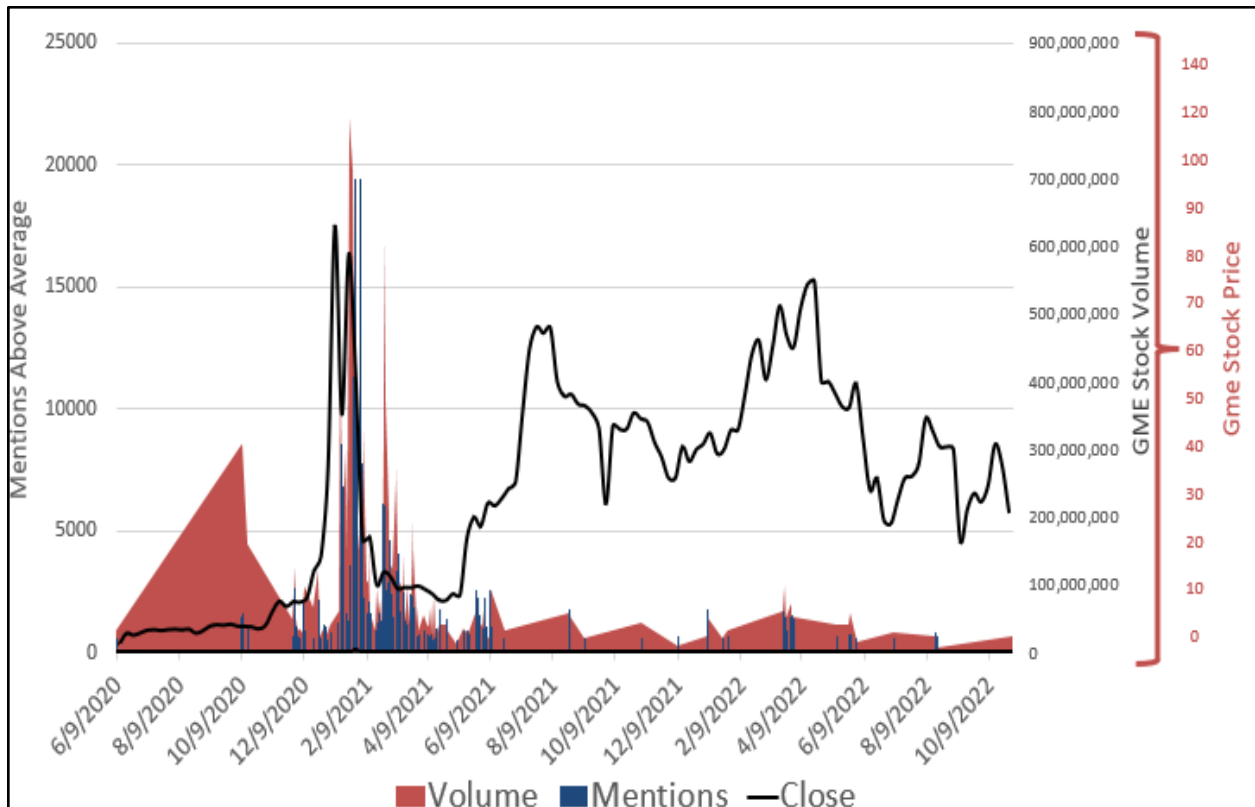


Figure 3. GameStop (GME) Stock Chart. Note. GME Stock Price is equal to close.

When looking at the other stocks in this study, a similar pattern could be mostly seen in all stocks' Market Cap levels during and after the GME squeeze except for the S&P 500 ETF (the largest of the bunch). For the S&P 500 graph and the Apple graph see Appendix A.

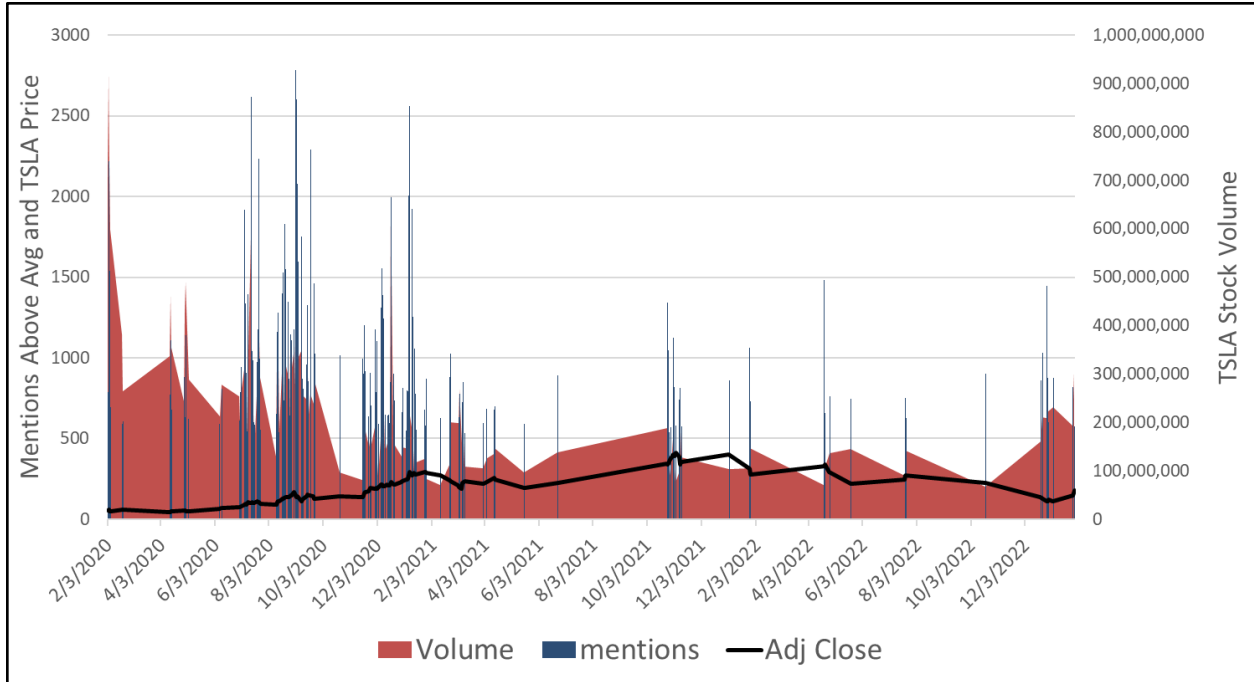


Figure 4. Large Cap Example: Tesla (TSLA) Stock Chart Note. Adj Close is the closing price of the stock-taking account for adjusted splits and dividends.

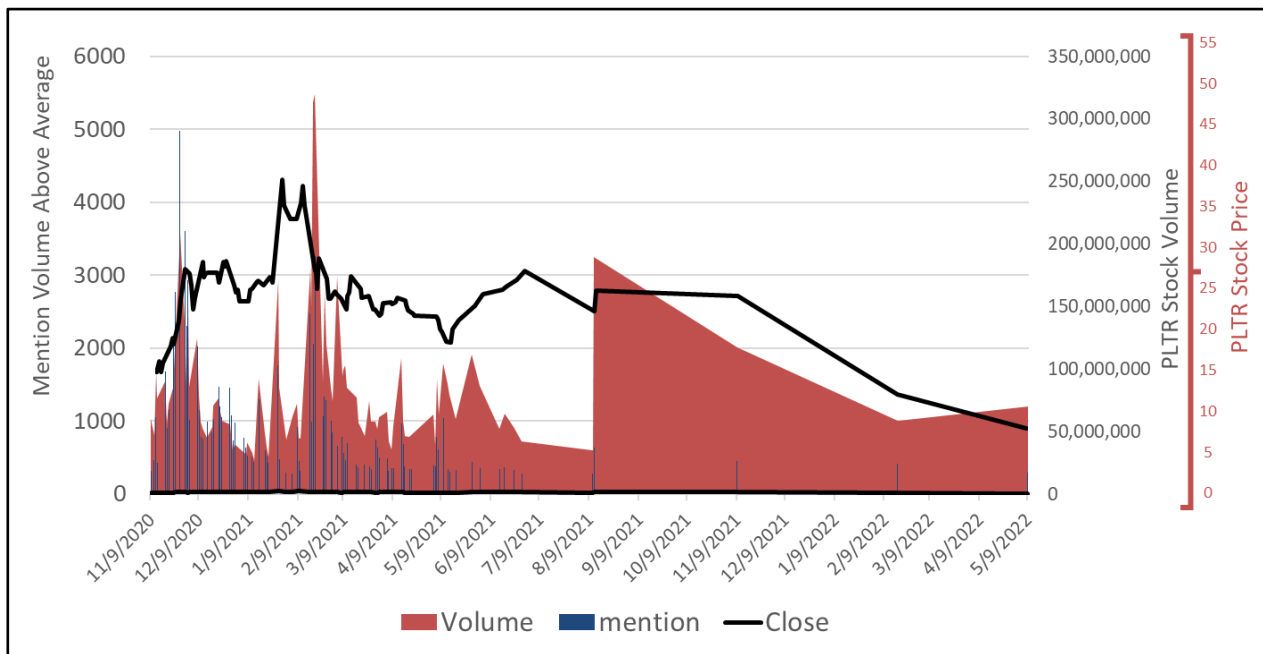


Figure 5. Mid Cap Example: Palantir (PLTR) Stock Chart

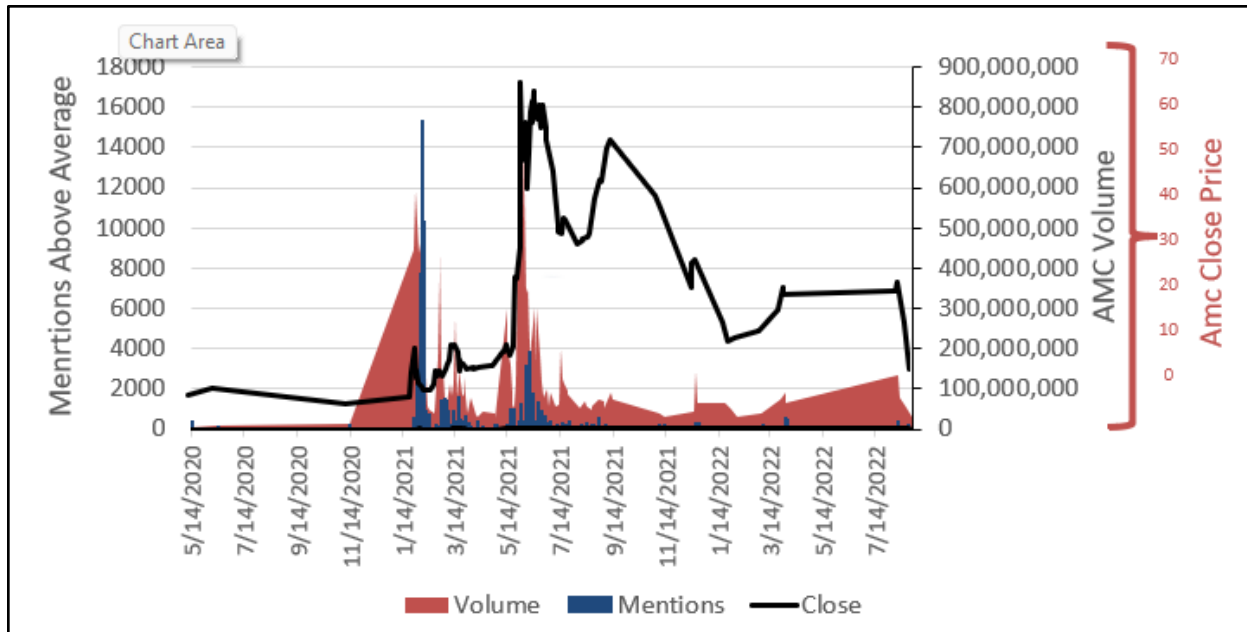


Figure 6. *Small Cap Example: AMC Entertainment (AMC) Stock Chart*

After finding these patterns existing in all but the most prominent cap asset, the correlation between the above avg mentions and the price change during these periods was measured along with the average bull run length for each stock. The data table is shown below. All values were rounded to 2 significant values.

Table 2. Average Run Length (ARL) and Correlation to Runs and Mentions (CRM) during different periods for different Stocks

Stocks (Ticker)	2020-2021		Jan 2021 (Squeeze)		Feb 2021-2023	
	ARL	CPM	ARL	CPM	ARL	CPM
SPY	5.56	0.01	N/A	N/A	22.16	0.12
AAPL	3.28	0.14	1.47	0.27	7.87	0.3
TSLA	3.82	0.18	1.76	0.24	17.23	0.34
PLTR*	1.7	-0.22	2	0.67	8.32	0.06
AMC	9.6	0.22	1.5	0.9	5.75	0.26
GME	10.2	0.16	1.78	0.82	3.35	0.38
Average	5.69	0.08	1.7	0.58	10.78	0.24

¹N/A in the SPY 500 row was due to insufficient above-average mentions data collected to highlight a correlation.

²CPM is equal to the r or Pearson Correlation Coefficient.

³PLTR had its IPO Sep 30, 2020, reducing the amount of collectible data.

Unlike the previous graphs, table 2 calculates the correlation between the above-average mentions and the stock runs (pumps) to all periods and all stocks simultaneously, considering all the variables defined in the methodology. The Average row considers all these to compare the stock data between different periods easily. The average Run length is measured in days, while the Correlation of Runs and Mentions (CRM) is measured on a 1.0 to -1.0 scale. A coefficient closer to 1.0 would show a strong positive correlation, 0 would show no correlation, and -1.0 would show a strong negative correlation. Considering that not only did the Pearson correlation coefficient increase (CPM) before and after the Squeeze in Jan 20221 from 0.08 to 0.28 but also the Average Run Length increased by 5.09 days, this

model shows mentions are impacting prices more highly, and these Retail influences are lasting longer. To see more of the values per period, see Appendix B.

Discussion

The consistent patterns from the graphs of prices reaching a support level leading to an increase of volume and price highlighted retail traders' firm but a limited grasp of influence on different focused on stocks. The reaching of the support level throughout the sharp decline triggered mentions, followed by volume and price afterward. This consistent cycle is seen in the various stocks numerous times. For example, Tesla, a large-cap stock (floating around 200b valuation), saw this cycle happen around four times a year after the main GME squeeze. The repeatability of this occurrence through Tesla and other stocks surveyed outlines a consistent nature and a longer-term influence of mentions on a stock price, hence outlining retail's consistent power over stocks.

This long-term influence is further highlighted by the retention of the increased CPM, especially after the GME squeeze, where CPMs and retail power overall spiked. As on average in the market, the CPM increased from .08 to .24. This might seem insufficient, but it is a large change as it highlights that most of these stocks had zero long-term Retail influence as mentioned above; the average did not correlate with the price changes during the 2020-2021 period. The CPM of 0.24 shows a significant change as the Pearson Correlation Coefficient shows a slight positive correlation on average in all these sectors in all different-sized companies.

However, this influence is limited in different-sized stocks and sectors as the largest test group, the SPY 500, an ETF, had basically zero correlation, showing that the retail influence is limited and cannot influence the whole market in the long run. In addition, a slight correlation was found in Palantir (PLTR), the mid-cap stock in the test group. This divergence from the test group, even though it did improve its CPM from negative to positive, could be due to multiple factors, like its IPO in September 2020. A drastic increase followed this IPO in stock volume and mentions early on. However, it dramatically decreased mention on the subreddit unit the GME squeeze, where it picked back up again, increasing its CPM to 0.60, showing a robust retail influence during that month. However, once the squeeze, the number of mentions above average was severely reduced, and mentions dropped drastically. This massive drop in mentions, with a large median of mentions from the IPO and Squeeze, could be a reason for the lack of correlation, as retail influence declined as the hype and interest for PLTR died down.

Excluding both SPY and PLTR, the rest of the stocks in the Study demonstrated a generally increased correlation from the 2020-2021 level as most stocks went from a non-existent long-term influence (0-.25) to a relatively small influence long-term from Feb 2021-2023 (0.25-0.5). This general increase throughout even large market companies capped hundreds of billions of dollars showed a stronger retail influence in these markets. Even though the smaller cap stocks decreased dramatically in their CPM correlation levels from the GME squeeze of >0.80 to 0.3, they still showed a significant increase in retail power from the previous standard shown during 2020-2021. The 2020-2021 period showed increased power for retail traders as their mentions influenced the stock to a higher degree long term, even though before that influence was low or non-existent.

In addition, the increase in Average Runs Length (ARL) also shows an increase in retail power as it shows that these runs that are made a start with an increase of mentions by the WallStreetBets subreddit. This increase is shown by the triangular/trapezoid pattern that lasts days to weeks in the volume after a large mention in Figures 3-6. The ARL increase is further shown in the table where on average, the ARL almost doubled from 5.69 days in the 2020-2021 period to 10.78 days in the Feb 2021-2023 period. This increase shows that retail traders retain their influence for longer, increasing retail power.

The price and volume increase in the lead by mentions, an increase of ARL, and an increase of the CPM (correlation coefficient) further proves the correlation between price, volume, and mentions highlighted by Renault but also further expands upon Renault and his findings in his research of pumps and dumps, as the pattern found in these stocks shows similar characteristics to pump and dumps. The pattern of how mentions increased, increasing volume, and the increasing price was shown throughout the stocks to have a gradual increase in stock price, especially during the Feb

2021-2023 period, resulting in a sharp decline and a repeat of the cycle. This gradual increase could highlight the evolution of the pump and dump through social media as the stock price no longer has that instant pump in share value from mentions and a rapid dump. Instead, the significant increase in shares leads to a more gradual increase in the volume and price of the stock, allowing the stock to gain momentum, followed by a sharp drop in share price. This evolution of the pump-in-dump outlined in my research could especially highlight how retail traders adapt and learn from the markets to become stronger and have more influence as they can use social media to gain interest in a stock affecting different groups to purchase and increase a stock price before the retail traders dump it.

Overall my new understanding from the data that I compiled and analyzed shows that retail traders do have long-term power and influence in the stock market, and this is increasing from previous years (2020-2021) as retail traders mention have more influence on stock price changes and these impacts last longer. This long-term power is, however, limited to individual stocks from small to large cap stock and cannot move the market as a whole yet.

Limitations

Limitations to this method include that it was only possible to look at some stocks that retail had tried to influence. I was limited to only a handful of stocks to look into the depth of the past three years. To reduce this limitation, I also tried to use indexes in the Study to help understand the broader impact that retail traders could have on the stock market without analyzing each stock; however, this was also limited as it put stocks that most retail traders have not heard about in my Study. Another limitation is that the data collected was limited just to r/wsb. The inability to use Twitter to expand the dataset was due to reduced Twitter API access and abilities as of February 4, 2023. More data from Twitter and other social media websites is needed to reanalyze the correlation of the data and expand the range of data. Being limited to just Reddit reduced the data set I used, which could hurt data accuracy, as different platforms have different retail traders focused on different stocks. This influence that different retail communities have on the stocks limits the implications of my data because it is only valid for the subreddit of WallStreetBets. Being stuck to only the Reddit dataset will only share Reddit attitudes instead of most of the "retail trader" media. This limitation is also somewhat limited, especially since Reddit is usually where these pumps and hype for most stocks happen, which carries onto different platforms like Twitter (Pedersen, 2021). Lastly, I was unable to openly look into the sentiment of the data like in Renault (2018) due to Reddit API limitations and my hardware limitations, which limits me a looking at the attitude of the traders; however, as proved in Renault (2018), most posts are considered bullish so mentions should also correlate into a bullish/optimistic indicator. Understanding this role sentiment of retail trading would help to refine my correlation and help understand the scenario that my data falls into, allowing retail power/influence to be better assessed.

Conclusion

In conclusion, more research should be conducted to address these experiment limitations. As seen from varying correlations of my result, mention in r/wsb cannot fully explain the power of retail traders. Future reach in this area can measure other companies of varying sizes and sectors. It should be applied to understand the present and future retail traders' outreach on the market. To improve the accuracy of these studies, external variables, other than public interest through mentions, should be addressed to better highlight the power that retail traders have in the market.

I plan to continue this studying by considering this experiment's possible limitations. I will still focus on pulling data for more off-stocks using my Java program; however, I will change where I pull different mentions, whether from social media sources like Facebook, Twitter, and other popular forms of media. I will also look at sentiment analysis to find if different sentiment affects the power of retail traders using standard deviation like used in Renault (2018). To avoid research already done with this sentiment analysis and my findings, I will examine how sentiment analysis of volume impacts mid to large-cap stocks. I will exclusively leave out ETFs like SPY 500, as they

had no significant retail power shown. When doing this research, I will prominently focus on the correlation between sentiment and critical support to more extensively understand what happens to cause mass retail movement during various stock levels. Secondly, I will also include level 2 market data ratio (number of listed by and sold at different price points) as a variable for my research. I will do this to gather an understanding of how retail traders build these supports at different levels and further understand the power and role that more considerable hedge funds and institutions might have in various bull runs for stocks when hitting critical support. Lastly, I will examine the general state of the US economy as an independent variable for my research. Since different stocks/people respond differently to economic phases, including quantitative indicators would allow better measurement of retail power and further enhance understanding of future power that retail traders could have on the market. The CPI data and Consumer Saving Index & Spending Index are examples of indicators to highlight whether the United States is in a recessionary or expansionary phase and how, more importantly, consumers are reacting. I could also use the US Federal Reserve discount. However, this rate would highlight more how big banks and incisions react to these phases and lessen the scope on consumer/retail traders, the focus of the Study.

References

- Ahmed, S. I. (2021). Explainer: What is a gamma squeeze and how did it drive up AMC's stock price? *Reuters*. <https://www.reuters.com/legal/litigation/what-is-gamma-squeeze-how-did-it-drive-up-amcs-stock-price-2021-06-04/>
- Anand, A., & Pathak, J. (2022). The role of Reddit in the GameStop short squeeze. *Economics Letters*, 211(0165-1765), 110249. <https://doi.org/10.1016/j.econlet.2021.110249>
- Chen, Hailiang & De, Prabuddha & Hu, Yu & Hwang, Byoung-Hyoun. (2011). Sentiment revealed in social media and its effect on the stock market. 25 - 28. 10.1109/SSP.2011.5967675.
- De Long, J. B., Shleifer, A., Summers, L. H., & Waldmann, R. J. (1990). Noise Trader Risk in Financial Markets. *Journal of Political Economy*, 98(4), 703–738. <http://www.jstor.org/stable/2937765>
- Glosten, L. R., & Milgrom, P. R. (1985b). Bid, ask and transaction prices in a specialist market with heterogeneously informed traders. *Journal of Financial Economics*, 14(1), 71–100. [https://doi.org/10.1016/0304-405x\(85\)90044-3](https://doi.org/10.1016/0304-405x(85)90044-3)
- Kyle, A. S. (1985). Continuous Auctions and Insider Trading. *Econometrica*, 53(6), 1315–1335. <https://doi.org/10.2307/191321>
- Lyócsa, Š., Baumöhl, E., & VÝrost, T. (2021). YOLO trading: Riding with the herd during the GameStop episode. *Finance Research Letters*, 102359. <https://doi.org/10.1016/j.frl.2021.102359>
- Mao, Y., Wei, W., Wang, B., & Liu, B. (2012). *Correlating S&P 500 stocks with Twitter Data*. <https://doi.org/10.1145/2392622.2392634>
- McCrank, J. (2021). Short-selling under spotlight in GameStop hearing. *Reuters*. <https://www.reuters.com/article/us-retail-trading-congress-shorting/short-selling-under-spotlight-in-gamestop-hearing-idUSKBN2AJ026ruft6y>
- Panda, G. (2021). *GameStop Stock: Don't Invest Into Short Squeezes (NYSE:GME) | Seeking Alpha*. Seekingalpha.com. <https://seekingalpha.com/article/4461445-gamestop-dont-invest-into-short-squeezes>
- Pedersen, L. H. (2022). Game on: Social networks and markets. *Journal of Financial Economics*, 146(3). Science Direct. <https://doi.org/10.1016/j.jfineco.2022.05.002>
- Renault, T. (2017). Market Manipulation and Suspicious Stock Recommendations on Social Media. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3010850>
- Smith, A. (2021). The Reddit revolt: GameStop and the impact of social media on institutional investors - The TRADE. www.thetradenews.com. <https://www.thetradenews.com/the-reddit-revolt-gamestop-and-the-impact-of-social-media-on-institutional-investors/>
- Staff Report on Equity and Options Market Structure Conditions in Early 2021. (2021). <https://www.sec.gov/files/staff-report-equity-options-market-struction-conditions-early-2021.pdf>

Weiss, R. (2023). *Top WallStreetBets Stocks to Buy - MarketBeat*. www.marketbeat.com.
<https://www.marketbeat.com/stocks/trending/wallstreetbets/>

Zheludev, I., Smith, R., & Aste, T. (2014). When Can Social Media Lead Financial Markets? *Scientific Reports*. <https://doi.org/10.1038/srep04213>