Bet it on Reddit: The Effects of Reddit Chatter on Highly Shorted Stocks

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I. Introduction

The idea of investing in and interacting with the stock market is typically associated with individuals who have great wealth and considerable educational backgrounds. As society continues to progress, access to personal investing has become much more widely accessible. Social media platforms and various online communities have made discussion regarding investing and the financial markets available to those who previously did not have the opportunities, capital, or the knowledge to participate.

To elaborate on the meteoric growth of social media, the 2019 Pew Research Center report and Social Media Fact Sheet illustrate that approximately 72% of the American adult public interacts with some form of social media, a meaningful change compared to the 5% of American adults using at least one social platform in 2005. In general, social media users have tended to be and continue to be disproportionately represented by the younger generations with 90% of adults between 18-29 years old using at least one platform compared to 40% of adults who are over 65 years old. That said, adoption continues to spread and the usage level difference between age groups continues to diminish. This advancement of social media and general growth in internet activity has paralleled better access to general knowledge, including financial and investment theories. In conjunction with these platforms, opportunities to invest have increased as online brokerages and investment apps have introduced the gamification of investing and the stock market. For example, Acorns, founded in 2012, serves as a way to passively invest in the stock market by rounding up purchases to the closest dollar and placing the additional cents into a curated investment portfolio. Meanwhile, social media-like robo-advisors, such as Robinhood (founded in 2013), have had major success with social media users, because of their zero commission trades and friendly user interface. These new applications have experienced major

adoption through referral programs that offer users free stocks and other various promotional mechanisms. With better access to both knowledge and investment opportunities, the only missing necessity for previously uninvested individuals is available capital. The use of leverage to borrow capital put into the stock market, commonly called margin trading, along with the existence of COVID-19 relief stimulus checks have given younger adults and individuals more access to investment capital. The removal of these long-standing barriers has provided those who historically have invested at much lower rates than their institutional and high net worth counterparts with the opportunity to participate in the stock market and other financial markets.

This paper attempts to quantify the impact of these changes. In particular, WallStreetBets will be used as a case study to identify if the social media community has had any quantifiable impact on the stock market and particularly on highly shorted stocks. To successfully explore this question, it is important to understand the history of WallStreetBets. WallStreetBets, also referred to as WSB, is an online community on the popular social media platform Reddit. The subreddit was founded in 2012 and has since amassed millions of subscribers. Primarily used to discuss stock and options trading, the online community is notoriously known for its risky trading strategies and unorthodox lexicon. On the subreddit, community members come together to discuss companies they “like," although thoughts shared in the subreddit are not considered financial advice. WSB members are typically retail investors, also known as non-professionals in the field. The online community has a strong camaraderie and a unique jargon that may come off to some as unsettling. In addition to discussions of stock and option trading, the subreddit is heavily saturated with memes and videos aimed at both rallying support for specific companies or worshipping community legends. In recent years, members have started to share their gains and losses with the community, posting screenshots from brokerage platforms. Publicly

displaying this type of information is often deemed unorthodox in typical financial circles. WSB came exploding onto the scene in late January 2021 as the community rallied behind gaming retailer GameStop (GME), suspectedly pumping the stock price up thousands of percent. Potential market manipulation from this event is currently under investigation by federal regulators. As the subreddit gained more mainstream media attention in late January 2021, there has been a suspected influx of bot accounts as first time users and new accounts flocked to join the increasingly popular online community. The question this paper hopes to answer is: Does the community have an influence on the stock market or was the GME incident a one-off, non-replicable event? In order to answer this, previous Reddit chatter surrounding highly shorted stocks will be investigated to determine the effect the platform has on any major changes in various stocks' prices.

II. Literature Review

There has been a reasonable amount of research exploring the role of traditional media and its influence on the stock market. Paul C. Tetlock (2007) quantitatively researches daily content from a Wall Street Journal column to determine the influence it has on various stock market trends in his paper. Tetlock concludes that pessimistic material predicts downward movement on stock prices followed by a reversal driven by stocks' underlying fundamentals. In a similar fashion, Wang, Chen, and Wei (2015) conduct research on the Taiwanese stock market in their paper. Similar to Tetlock, they find that media coverage can be used as a proxy for stock price movements and that investors can reasonably implement media coverage as an additional method of making investment decisions. With that said, the traditional media's impact on stock price movement only tangentially relates to the possible influences that social media may have.

Given the novelty of social media, in comparison to the stock market and traditional media, there is less available research. Prior studies have looked into the effects of various social media platforms on stock price performance. Arthur J. O'Connor (2013) found a positive correlation and a statistically significant relationship between a company's stock price and the number of Facebook fan accounts associated with it. In his research on the top 30 most popular consumer brands, he found that social media popularity may be a good indication of overall performance or customer loyalty. In an analysis on trends in the stock market, Li, Wang, Madden et al. (2019) explored market fluctuations and possible connections to a once popular microblogging social media platform called Tencent Weibo. In their study, the authors designed a social influence model to detect possible correlations to the Hushen 300 Index. The findings suggest that the social influence model can help individuals understand short term market fluctuations.

Additionally, given the accessibility and anonymity of social media platforms, it is useful to explore the impact of bots and propaganda on online communities. As previously mentioned, the social networking power and information sharing capabilities of social media platforms create an ideal environment for the use of "automatic" bots and propaganda intended to produce momentum and support behind various messages or ideas. Though the time table for this paper will largely preclude the periods of major bot influx to WSB, it is still important to understand the presence of these bots and the potential impact they may have on various social media platforms. Lieutenant Colonel Jarred Prier, USAF (2017) explains that social media has evolved into a tool for "modern information-age warfare". Although his paper primarily discusses the implications of social media propaganda coming from various state and non-state actors such as

Russia and Islamic State (IS), tangentially it provides insight into the influence and momentum that can be artificially created through these wide-reaching online platforms.

There has been an increasing amount of literature on the power that social media and online communities have on predicting stock market movements. In particular, the role of sentiment analysis on posts to various social media communities has been investigated. However, this paper will not dive into the predictive power of Reddit chatter. Instead the paper will focus on the extent to which social media platforms like WallStreetBets have the potential power to move the market.

III. Data

The data used in this paper are split into two overarching categories: data gathered from the subreddit of WallStreetBets and data gathered from various financial databases and resources such as COMPUSTAT, CRSP, the U.S. Treasury Department, and Yahoo Finance. The data collected spans for a 10-month period ranging from March 9, 2020 to January 22, 2021. We chose March 9th as a starting date as it marks the beginning of the global stock market crash caused by Covid-19, which is also referred to as Black Monday. This is a reasonable starting date as it was representative of the world in its current state. To avoid suspected bot activity, we stopped recording posts after January 22, 2021. This date marks the end of the week prior to the mainstream media attention on WallStreetBets. Following this day, the subreddit nearly doubled in users in a week, many of which were suspected bot accounts.

Stock Data

The first step in gathering the stock data was determining which companies should be included. In order to avoid issues of cherry-picking specific stocks that would fit the WallStreetBets narrative, we decided to look at the top 50 most shorted stocks. This was done as

highly shorted stocks are expected to typically perform worse than the market. As a result, this would magnify any potential positive effects found on a particular stock's price via positive social media pressure. In order to determine this list, we pulled data points on the over 8,500 stocks readily available on the COMPUSTAT database. More specifically, information on "Shares Held Short as of Settlement Date," a count of a specific company's total shares that are held in a short position at a given date, was used for each of the 50 stocks. In conjunction with this, both daily price data and total shares outstanding were recorded for the over 7,600 stocks available on CRSP. After combining these two data sets and removing various data points that were not relevant (for example, data on an ETF or index fund), we divided the total number of shares held short by the total number of outstanding shares for each stock in order to calculate their associated shares held short percentage. Finally, we sorted these stocks from highest shares held short percentage to lowest and selected the top 50. The range of shares held short percentage for our stock list ranges from 386.1% down to 30.9%. After selecting the group of 50 stocks to regress, we matched each with its respective daily prices from CRSP based on the date range of March 9, 2020 to January 22, 2021.

Next, we gathered information on the yield curve via the U.S. Treasury Department website. Initially, we pulled each of the Treasury bond rates ranging from the 1-Month bond to the 30-Year bond. However, after discussing and reviewing the movement of the yield curve we decided to select a short-term bond (1-Month) and a long-term bond (10-Year) to capture short- and long-term investor sentiment. This was done, as the short-term bonds (i.e. shorter than 5 years) moved closely together. Similarly, the long-term bonds (i.e. 5 years and longer) were highly correlated.

Finally, we gathered various information from Yahoo Finance. In particular, the information included data on the stocks' specific sectors, those sectors' daily stock prices, and daily prices for the market. Firms from our list of 50 highly shorted stocks fell under nine of the stock sectors pulled from Yahoo Finance, with the majority of stocks belonging to either Consumer Cyclical, Healthcare, and Communication Services. None of the most shorted stocks belonged to the Utilities Sector and only one firm was in the Financial Sector. In order to consistently measure each of the sectors and the market, Vanguard Sector ETFs and Vanguard's S&P 500 ETF were utilized as proxies.

WallStreetBets Data

Statistics from Reddit's WallStreetBets subreddit regarding daily posts, likes, and comments counts are not easily accessible. For this reason, we developed a computer script to sift through historical posts on the subreddit (special thanks to Christopher Jung - USD '20 for developing the script). As there are no public archives of Reddit posts, we used the website "redditsearch.io" to gain access to historical post records. The script was programmed to record posts that included at least one of the 50 company names or tickers and the relative number of likes and comments associated with these posts. In addition to this, the dates of the posts were also recorded. In order to accurately filter, the script required posts to meet the following criteria: must contain a ticker/string (or permutation, e.g. "Gamestop" or "gamestop" or "GME" or "gme" and others), must be standalone or surrounded only by non-alphanumeric characters ("?!/\%&#" etc.), and must be contextually relevant to the ticker/string (e.g. RH must be representative of Restoration Hardware instead of Robinhood). Following hours of data collection and post filtration, the script captured over 14,000 posts pertaining to relevant stock tickers. Seven of the

top 50 most shorted companies did not have any WSB mentions, causing us to shrink our list to 43 stocks.

Table 1: WallStreetBets Summary Statistics

	Posts	Likes	Comments
GME	8,876	1,522,464	455,402
AMC	643	41,206	10,944
NIO	2,858	279,258	69,932
Others	1,815	106,296	53,109
Totals	14,192	1,949,224	589,387

Figure 1: Summary of WallStreetBets and Stock Data from 3/9/20 to 1/22/21

Figure 2: Time Series of Smoothed WallStreetBets and Stock Data

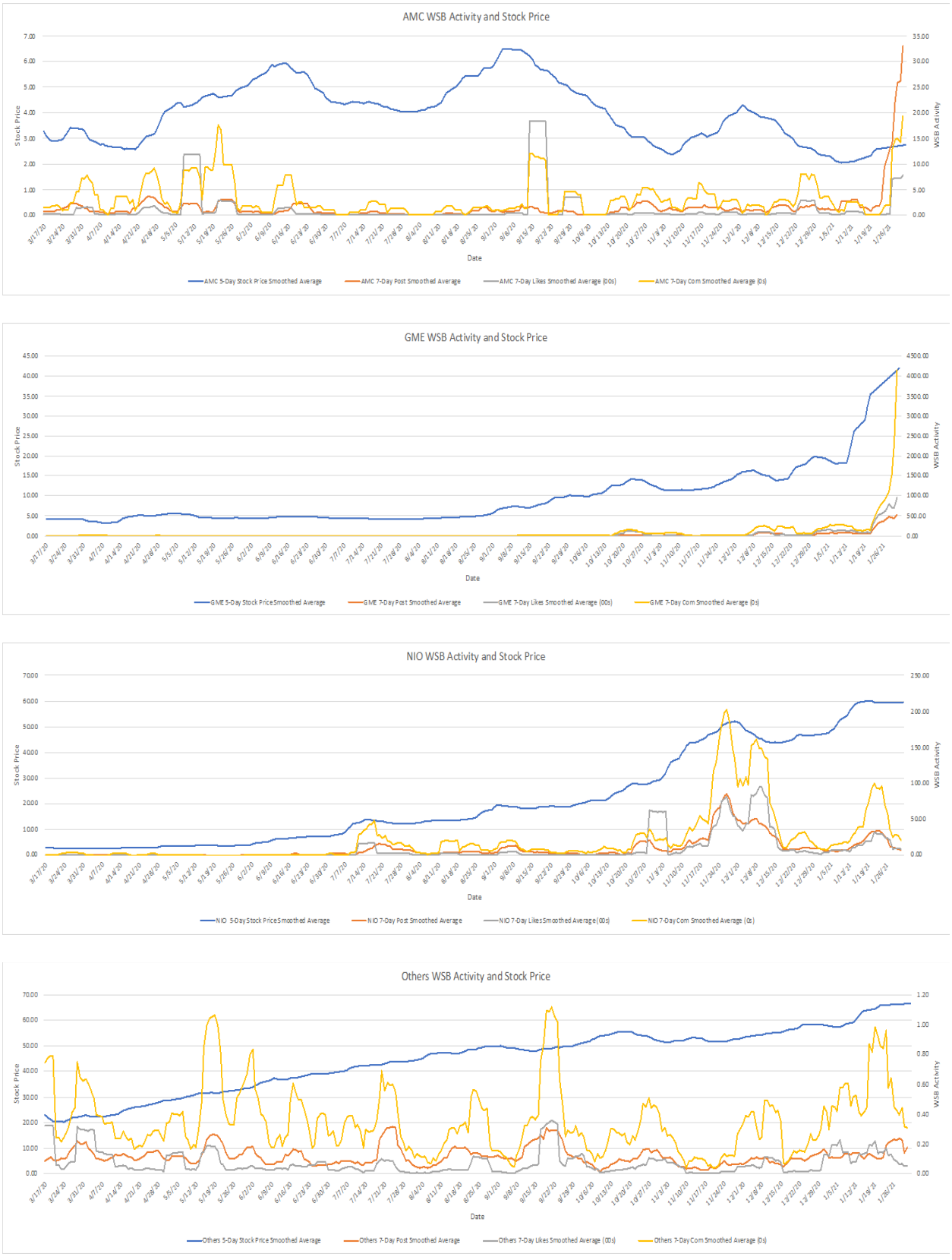

Table 1 and Figure 1 display a summarization of the data collected by the script. As seen above, the majority of posts on top highly shorted companies pertained to three companies in particular: AMC, GME, and NIO. These three companies alone made up roughly 87% of all posts captured, with almost 63% of these posts relating directly to GME. Subsequently, the other forty companies were hardly ever mentioned in the WallStreetBets subreddit over the 10-month timeframe. Figure 2 illustrates the relationship over time between posts, likes, and comments from WallStreetBets and the stock price for the three companies as well as a compilation of all other highly shorted companies.

IV. Methodology

After combining the stock price and the WallStreetBets data, we began to investigate various ways of measuring the two together in a regression. In particular, we needed to avoid measuring levels of WallStreetBets chatter that followed a major spike or dip, as this would provide us with reverse causality. Given this, we decided it would be best to look at prior periods of posts, likes, and comments and compare them with future price changes. Under the hypothesis that these sorts of social pressures would result in short-term price changes in the stocks, we selected a short-term period and a long-term period. The short-term period looked at the sum of posts, likes, and comments over a seven-day period starting seven days (one week) prior to the beginning of a stock's future price growth. For example, if we are measuring a stock's future price growth starting on March 9, 2020, the short-term period will look at the sum of each of the WSB variables from March 2, 2020 to March 8, 2020. The long-term period looked at the 7-day sum of posts, likes, and comments, starting 28 days prior to a stock's future price growth. For example, if we are measuring a stock's future price growth starting on March 30, 2020, the long-term period will look at the sum of each of the data points from March 2, 2020 to March 8, 2020.

These points were then matched to corresponding days of future price growth (in the above examples these days would be March 9 and March 30).

In order to calculate the future price growth of the stocks, we utilized a 5-market day forward percentage change in stock price ("Forward Percent Change"). By doing this, we hoped to capture all possible associated effects of prior period WallStreetBets chatter. In order to calculate this, we took a stock's price on a certain day (to continue the example from above, consider March 9th). We then looked five market days forward and calculated the percentage change between the two values. This provided us with a metric of short-term growth in each of the stocks' prices.

A further reason why we elected to categorize our variables in this manner was because of the added complexity of weekends and holidays. The stock market is closed on weekends and on nine holidays (our date range included eight of these holidays). Meanwhile, the chatter on WallStreetBets is continuous and is present every day of the period. As a result, we had more days of WallStreetBets data than we did stock market price data. In order to account for this, we aligned each open stock market day with its corresponding seven-day sum of subreddit chatter. This was done to ensure that all WallStreetBets posts were represented in the data. To be clear, weekend posts, likes, and comments were included in the seven-day sums despite not having a directly corresponding open stock market day. For example, the open stock market date Monday, January 11, 2021 was aligned with the seven-day prior sum of posts from January 4th-10th (January 8th-9th being weekend days).

With this methodology, we hoped to account for the various issues that are associated with social media - stock market research papers including cherry-picking and reverse causality.

Moving forward to the regressions, we selected the following regressions to measure the impact of WallStreetBets on various stocks.

1. $ForwardPercentChange = \beta_0 + \beta_1 7\text{-}DayWSBPosts + \beta_2 7\text{-}DayWSBLikes + \beta_3 7\text{-}DayWSBComments + \beta_4 1\text{-}MonthYield + \beta_5 10YearYield + \beta_6 5\text{-}DaySectorForward\%PriceChange + \beta_7 5\text{-}DayS\&P500Forward\%PriceChange + \mu$

2. $ForwardPercentChange = \beta_0 + \beta_1 28\text{-}DayWSBPosts + \beta_2 28\text{-}DayWSBLikes + \beta_3 28\text{-}DayWSBComments + \beta_4 1\text{-}MonthYield + \beta_5 10YearYield + \beta_6 5\text{-}DaySectorForward\%PriceChange + \beta_7 5\text{-}DayS\&P500Forward\%PriceChange + \mu$

V. Results

For the full list of regressions for each of the companies, refer to the Regression Results section of the Appendix. Focusing in on the popular Reddit stocks, none of the three companies saw statistically significant coefficients for the 7-day prior sums of WSB posts. In other words, the number of posts pertaining GME, AMC, and NIO occurring seven days prior to the stock price date did not have a significant effect on the Forward Percent Change in stock price. In addition to this, GME and AMC did not see statistically significant coefficients for WSB likes. However, the 7-day prior sum of WSB likes was statistically significant at the 5% level for NIO's Forward Percent Change. Interestingly, both AMC and GME saw statistically significant coefficients for the WSB comments. This provides interesting insight regarding how actively the posts are interacted with. Despite the volume of posts not being significant, the comments on these posts suggest that users actively engaged and shared opinions regarding investor sentiment. Although the coefficients for the WSB variables seem microscopic, keep in mind there were millions of likes and comments resulting in considerable impacts on GME, AMC, and NIO's 5-day Forward Percent Change in stock prices. GME and AMC likely saw different results in comparison to NIO due to the popularity levels in the WSB subreddit. NIO saw a consistently high number of posts in WallStreetBets for the entire duration of the 10-

month period, while GME and AMC saw dramatic increases in posts in January of 2021. For this reason, the amount of likes NIO posts received may have been a better metric regarding investor sentiment towards NIO, whereas GME and AMC comments seemed to have more influence for those investors interested in GME or AMC.

In addition to the WallStreetBets data, 32 out of the 43 companies exhibited that sector growth was statistically significant in its effect on Forward Percent Change. This was expected as it is uncommon for stocks to move in opposite directions from their sectors. Shifting gears to 28-day prior data, the statistically significant coefficient switched from the sector growth to growth in the 10-year and 1-month Treasury bonds. These yield curve coefficients were positive as the stock price movements aligned with fluctuations of the yield curve. 31 of the 43 companies exhibited statistically significant results for either one of or both of the yield curves metrics. Both GME and NIO did not see any WallStreetBets coefficients with statistically significant results, implying that one-month prior Reddit chatter did not have a significant effect on the Forward Percent Changes in stock prices for the companies. AMC's 28-day prior WSB Likes coefficient was statistically significant, suggesting that the one-month prior likes on AMC posts influenced the stock price. Various other companies saw inconsistent results in regards to the WSB coefficients. Some companies saw statistically significant results, oftentimes with negative coefficients. This was likely due to the original sentiment regarding the highly shorted nature of the stocks.

VI. Conclusion

This paper sought to investigate a potential causal relationship between WallStreetBets activity and changes in stock prices. Focusing specifically on highly shorted stocks, we gathered WSB subreddit data on posts, likes, and comments as well as data on various stock market

metrics for a 10-month period. We tested the effects of 7-day prior WSB activity on changes in stock prices and found statistically significant results for the 7-day prior comments for GME and AMC and for the 7-day prior posts for NIO. When looking at one-month prior levels, we found statistically significant results for the 28-day prior AMC likes. This difference can likely be attributed to the behavior by the WallStreetBets community as they focused all attention on GME and AMC in January 2021 while consistently supporting NIO. For the majority of the highly shorted stocks analyzed, changes in stock prices aligned with their respective sectors for 7-day priors and both yield curve metrics for 28-day priors.

Our research ran into several limitations making it difficult to effectively monitor the chatter levels of WSB and regress their impacts of various stocks. In particular, the influx of bot activity and mainstream media attention that the site garnered immediately after our time period of March 9, 2020 to January 22, 2021 created significant noise in the data. The WSB community during this period went from two million users up to over seven million, which likely would have provided the subreddit with more influencing power; however, many of these users were thought to be bots, not meeting the criteria of users we attempted to capture in our research. Coinciding with these increases in WSB activity, AMC, GME, and other various WSB stock favorites saw massive gains unlike anything seen previously in our data set. Despite this and the potential outsized effects that we may have been able to observe, we had to exclude these price increases as the data became potentially biased. Secondly, the script used to gather data from WallStreetBets was only able to grab text-based posts. Although the majority of posts were text based, we were unable to extract data on posts made in meme or video formats, as the script could not identify words in these images and videos. Unfortunately, these formats tend to be used in the most popular and widely shared posts on WallStreetBets.

The results found in this paper have potential real-world implications as online communities increase in size and strength. With that said, our research serves as a robust foundation for future investigations into the impacts of social media platforms and their community influence on stock prices. Our findings are consistent with the idea that online communities have the potential to strategically organize and move specific stock prices if they garner enough support and momentum. A potential step going forward would be to investigate the sentiment of individual posts and comments. As opposed to looking at the sheer volume, this would serve as an additional measure of influence that we were unable to quantify. Another possible avenue to explore further is the effect of other social media platforms on various other financial systems such as the cryptocurrency, commodity, and bond markets. As social media platforms continue to evolve into informational markets, it is imperative that research in this area continues in order to help economists better understand the implications that these online worlds have on the financial system and various other industries.

VII. Appendix

Regression Results

*Statistically significant at the 5% level
**Statistically significant at the 1% level

AMC		
Variable	7 Day Prior	28 Day Prior
WSB Posts	0.0049	0.0046
	(0.053)	(0.126)
WSB Likes	0.0000	0.0000
	(0.176)	(0.045)*
WSB Comments	-0.0002	0.0001
	(0.004)**	(0.339)
YC 1 Month	-0.0451	0.0133
	(0.008)**	(0.796)*
YC 10 Year	0.0082	0.4101
	(0.936)	(0.004)**
Sector Growth	2.9801	-2.8718
	(0.002)**	(0.007)**
S&P Growth	-0.8158	3.7397
	(0.375)	(0.000)**
R^2	0.2157	0.1351

ANGI		
Variable	7 Day Prior	28 Day Prior
WSB Posts	0.0139	-0.0952
	(0.675)	(0.006)**
WSB Likes	-0.0036	0.0022
	(0.042)*	(0.229)
WSB Comments	0.0051	-0.0035
	(0.049)*	(0.190)
YC 1 Month	-0.0077	-0.0036
	(0.346)	(0.889)
YC 10 Year	-0.0257	-0.0090
	(0.607)	(0.894)
Sector Growth	1.9553	1.2543
	(0.000)**	(0.017)*
S&P Growth	-0.8856	-1.3995
	(0.048)*	(0.005)**
R^2	0.1841	0.1156

BBBY		
Variable	7 Day Prior	28 Day Prior
WSB Posts	0.0054	0.0007
	(0.036)*	(0.886)
WSB Likes	0.0000	0.0001
	(0.239)	(0.199)
WSB Comments	-0.0001	-0.0005
	(0.251)	(0.085)*
YC 1 Month	-0.0053	0.0157
	(0.653)	(0.666)
YC 10 Year	0.2444	0.3583
	(0.001)**	(0.000)**
Sector Growth	2.6392	-0.9956
	(0.000)**	(0.033)*
S&P Growth	-1.1313	0.4273
	(0.064)	(0.463)
R^2	0.3865	0.2059

BEST		
Variable	7 Day Prior	28 Day Prior
WSB Posts	-0.0299	0.0216
	(0.069)	(0.312)
WSB Likes	0.0014	0.0036
	(0.606)	(0.243)
WSB Comments	-0.0063	-0.0184
	(0.658)	(0.262)
YC 1 Month	-0.0058	-0.0602
	(0.359)	(0.028)*
YC 10 Year	0.0212	0.0606
	(0.628)	(0.267)
Sector Growth	-0.4044	-0.4220
	(0.077)	(0.087)
S&P Growth	1.2844	0.2377
	(0.000)**	(0.472)
R^2	0.1749	0.0659

BGS		
Variable	7 Day Prior	28 Day Prior
WSB Posts	0.0099	-0.0327
	(0.718)	(0.152)
WSB Likes	0.0009	-0.0196
	(0.894)	(0.001)**
WSB Comments	-0.0015	0.0213
	(0.828)	(0.000)**
YC 1 Month	-0.0148	-0.0232
	(0.013)*	(0.106)
YC 10 Year	-0.0095	-0.0386
	(0.791)	(0.321)
Sector Growth	1.6327	-0.3259
	(0.000)**	(0.148)
S&P Growth	-1.0706	0.1732
	(0.000)**	(0.366)
R^2	0.1565	0.1251

BOOM		
Variable	7 Day Prior	28 Day Prior
WSB Posts	-0.0116	-0.0188
	(0.441)	(0.257)
WSB Likes	0.0001	-0.0003
	(0.699)	(0.065)
WSB Comments	0.0004	0.0020
	(0.572)	(0.010)**
YC 1 Month	-0.0055	0.0713
	(0.284)	(0.000)**
YC 10 Year	0.1887	0.2867
	(0.000)**	(0.000)**
Sector Growth	0.6672	0.0309
	(0.000)**	(0.734)
S&P Growth	-0.1929	-0.2012
	(0.206)	(0.261)
R^2	0.4569	0.3440

BZUN		
Variable	7 Day Prior	28 Day Prior
WSB Posts	-0.0356	-0.0548
	(0.100)	(0.028)*
WSB Likes	-0.0004	0.0001
	(0.291)	(0.793)
WSB Comments	0.0022	0.0010
	(0.177)	(0.589)
YC 1 Month	-0.0001	-0.0118
	(0.982)	(0.571)
YC 10 Year	0.0624	0.1920
	(0.108)	(0.001)**
Sector Growth	0.6971	-0.0462
	(0.007)**	(0.862)
S&P Growth	0.3436	-0.2250
	(0.300)	(0.494)
R^2	0.3222	0.1137

CLF		
Variable	7 Day Prior	28 Day Prior
WSB Posts	0.0000	0.0064
	(0.986)	(0.253)*
WSB Likes	-0.0002	0.0003
	(0.084)	(0.203)
WSB Comments	0.0003	-0.0010
	(0.094)	(0.077)
YC 1 Month	0.0035	0.0178
	(0.596)	(0.424)
YC 10 Year	0.1140	0.4937
	(0.006)**	(0.000)**
Sector Growth	1.7919	-0.0545
	(0.000)**	(0.840)
S&P Growth	-0.4220	-0.0948
	(0.161)	(0.784)
R^2	0.5353	0.3281

CLVS		
Variable	7 Day Prior	28 Day Prior
WSB Posts	0.0694	0.0225
	(0.610)	(0.872)*
WSB Likes	0.0366	0.0078
	(0.292)	(0.827)
WSB Comments	-0.0221	-0.0046
	(0.328)	(0.844)
YC 1 Month	-0.0160	0.0382
	(0.134)	(0.237)
YC 10 Year	-0.2367	-0.2453
	(0.000)**	(0.006)**
Sector Growth	3.4692	1.5175
	(0.000)**	(0.008)**
S&P Growth	-1.6074	-1.2352
	(0.003)**	(0.024)*
R^2	0.3550	0.0629

CVNA		
Variable	7 Day Prior	28 Day Prior
WSB Posts	0.0028	-0.0102
	(0.412)	(0.001)**
WSB Likes	0.0003	0.0002
	(0.002)**	(0.002)**
WSB Comments	-0.0005	-0.0002
	(0.000)**	(0.163)
YC 1 Month	-0.0321	0.0093
	(0.025)*	(0.767)
YC 10 Year	-0.1699	0.1085
	(0.018)*	(0.171)
Sector Growth	3.5341	1.0385
	(0.000)**	(0.014)*
S&P Growth	-1.5080	-1.9070
	(0.014)*	(0.000)**
R2	0.5233	0.1534

DDS		
Variable	7 Day Prior	28 Day Prior
WSB Posts	-0.0363	-0.0362
	(0.044)*	(0.059)
WSB Likes	-0.0060	-0.0024
	(0.262)	(0.678)
WSB Comments	0.0034	0.0014
	(0.278)	(0.685)
YC 1 Month	-0.0388	-0.0413
	(0.000)**	(0.179)
YC 10 Year	0.2084	0.3794
	(0.001)**	(0.000)**
Sector Growth	0.5814	-1.2002
	(0.129)	(0.002)**
S&P Growth	0.9828	0.8306
	(0.050)*	(0.080)
R2	0.3753	0.2101

DQ		
Variable	7 Day Prior	28 Day Prior
WSB Posts	-0.2457	0.0424
	(0.000)**	(0.234)
WSB Likes	0.0062	-0.0022
	(0.002)**	(0.644)
WSB Comments	-0.0101	0.0036
	(0.005)**	(0.751)
YC 1 Month	-0.0132	-0.0511
	(0.301)	(0.294)
YC 10 Year	0.2006	0.3997
	(0.010)**	(0.002)**
Sector Growth	2.1687	1.1721
	(0.000)**	(0.113)
S&P Growth	-0.9670	-0.7979
	(0.144)	(0.348)
R2	0.1286	0.0781

EC		
Variable	7 Day Prior	28 Day Prior
WSB Posts	0.0904	0.0141
	(0.032)*	(0.79)
WSB Likes	-0.0004	0.0007
	(0.709)	(0.647)
WSB Comments	-0.0032	-0.0022
	(0.448)	(0.682)
YC 1 Month	0.0109	0.0659
	(0.008)**	(0.000)**
YC 10 Year	-0.1122	0.2369
	(0.000)**	(0.000)**
Sector Growth	0.8165	0.0564
	(0.000)**	(0.511)
S&P Growth	0.7366	-0.3150
	(0.000)**	(0.059)
R2	0.7826	0.3146

GME		
Variable	7 Day Prior	28 Day Prior
WSB Posts	0.0004	-0.0001
	(0.146)	(0.898)
WSB Likes	0.0000	0.0000
	(0.151)	(0.190)
WSB Comments	0.0000	0.0000
	(0.029)*	(0.259)
YC 1 Month	-0.0419	-0.0387
	(0.039)*	(0.546)
YC 10 Year	0.0425	-0.0376
	(0.73)	(0.821)
Sector Growth	1.2103	0.9521
	(0.125)	(0.240)
S&P Growth	0.1185	-1.6833
	(0.908)	(0.094)
R2	0.1730	0.0344

GOGO		
Variable	7 Day Prior	28 Day Prior
WSB Posts	0.0299	0.0084
	(0.098)	(0.638)
WSB Likes	-0.0066	-0.0010
	(0.021)*	(0.731)
WSB Comments	0.0040	-0.0008
	(0.062)	(0.706)
YC 1 Month	-0.0283	-0.0354
	(0.102)	(0.487)
YC 10 Year	0.1395	0.3492
	(0.190)	(0.011)*
Sector Growth	1.5760	0.5759
	(0.113)	(0.576)
S&P Growth	-0.6498	-0.5870
	(0.493)	(0.543)
R2	0.0753	0.0372

HIBB		
Variable	7 Day Prior	28 Day Prior
WSB Posts	-0.1063	0.0305
	(0.008)**	(0.480)
WSB Likes	0.0003	0.0002
	(0.227)	(0.261)
WSB Comments	-0.0003	-0.0011
	(0.813)	(0.440)
YC 1 Month	0.0120	0.0411
	(0.236)	(0.107)
YC 10 Year	0.0281	0.2391
	(0.571)	(0.000)**
Sector Growth	2.0172	-0.6034
	(0.000)**	(0.085)
S&P Growth	-0.2044	0.4897
	(0.628)	(0.252)
R2	0.5431	0.1559

HUYA		
Variable	7 Day Prior	28 Day Prior
WSB Posts	0.0096	-0.0099
	(0.001)**	(0.000)**
WSB Likes	0.0001	-0.0001
	(0.007)**	(0.088)
WSB Comments	-0.0003	0.0003
	(0.000)**	(0.000)**
YC 1 Month	-0.0010	-0.0490
	(0.888)	(0.017)*
YC 10 Year	-0.2178	0.0039
	(0.000)**	(0.942)
Sector Growth	0.5191	0.2917
	(0.180)	(0.484)
S&P Growth	0.6824	-0.4333
	(0.069)	(0.272)
R2	0.3140	0.1346

IRBT		
Variable	7 Day Prior	28 Day Prior
WSB Posts	0.0071	-0.0048
	(0.244)	(0.487)
WSB Likes	0.0001	0.0006
	(0.840)	(0.032)*
WSB Comments	-0.0013	-0.0002
	(0.015)*	(0.792)
YC 1 Month	-0.0122	0.0175
	(0.112)	(0.364)
YC 10 Year	0.0009	0.0716
	(0.980)	(0.141)
Sector Growth	1.2075	0.2815
	(0.000)**	(0.326)
S&P Growth	-0.2790	-0.4503
	(0.354)	(0.177)
R2	0.3503	0.0745

KIRK		
Variable	7 Day Prior	28 Day Prior
WSB Posts	-0.0037	0.0069
	(0.795)	(0.723)
WSB Likes	0.0033	-0.0028
	(0.028)*	(0.832)
WSB Comments	-0.0073	-0.0012
	(0.120)	(0.878)
YC 1 Month	-0.0180	-0.1010
	(0.275)	(0.052)
YC 10 Year	-0.2125	-0.1816
	(0.032)*	(0.178)
Sector Growth	2.6545	-0.9283
	(0.000)**	(0.155)
S&P Growth	-1.4720	0.4482
	(0.079)	(0.58)
R2	0.2241	0.0409

LGND		
Variable	7 Day Prior	28 Day Prior
WSB Posts	-0.0076	0.0042
	(0.206)	(0.483)
WSB Likes	0.0004	0.0015
	(0.785)	(0.291)
WSB Comments	0.0013	-0.0023
	(0.562)	(0.319)
YC 1 Month	0.0059	0.0331
	(0.372)	(0.087)
YC 10 Year	0.0349	0.0451
	(0.374)	(0.372)
Sector Growth	0.5361	0.7260
	(0.109)	(0.026)*
S&P Growth	0.3874	-0.8578
	(0.217)	(0.007)**
R2	0.2027	0.0968

LL		
Variable	7 Day Prior	28 Day Prior
WSB Posts	-0.0126	-0.0272
	(0.005)**	(0.000)**
WSB Likes	0.0000	0.0000
	(0.373)	(0.232)
WSB Comments	0.0001	0.0001
	(0.35)	(0.575)
YC 1 Month	-0.0195	0.1649
	(0.044)*	(0.000)**
YC 10 Year	-0.0455	-0.0069
	(0.423)	(0.924)
Sector Growth	2.9308	-0.1067
	(0.000)**	(0.764)
S&P Growth	1.1440	-0.0670
	(0.018)*	(0.879)
R2	0.5627	0.2572

MED		
Variable	7 Day Prior	28 Day Prior
WSB Posts	0.1069	-0.0073
	(0.085)	(0.919)
WSB Likes	-0.0893	0.0205
	(0.094)	(0.743)
WSB Comments	0.0643	-0.0148
	(0.097)	(0.743)
YC 1 Month	-0.0063	0.0252
	(0.283)	(0.202)
YC 10 Year	-0.0047	0.1401
	(0.893)	(0.006)**
Sector Growth	1.7262	0.1831
	(0.000)**	(0.472)
S&P Growth	-0.5876	-0.3675
	(0.059)	(0.251)
R2	0.5235	0.0816

MSGN		
Variable	7 Day Prior	28 Day Prior
WSB Posts	0.0035	0.0165
	(0.669)	(0.026)*
WSB Likes	-0.0001	-0.0001
	(0.876)	(0.905)
WSB Comments	-0.0002	-0.0001
	(0.769)	(0.889)
YC 1 Month	-0.0131	-0.0130
	(0.063)	(0.495)
YC 10 Year	0.1698	0.2451
	(0.000)**	(0.000)**
Sector Growth	0.9685	0.6770
	(0.004)**	(0.066)
S&P Growth	-0.1436	-0.9427
	(0.658)	(0.007)**
R2	0.2793	0.1911

NIO		
Variable	7 Day Prior	28 Day Prior
WSB Posts	-0.0001	-0.0004
	(0.798)	(0.359)
WSB Likes	0.0000	0.0000
	(0.019)*	(0.430)
WSB Comments	0.0000	0.0000
	(0.293)	(0.937)
YC 1 Month	-0.0167	-0.0359
	(0.218)	(0.402)
YC 10 Year	0.0657	0.3265
	(0.415)	(0.003)**
Sector Growth	1.4933	0.8627
	(0.005)**	(0.113)
S&P Growth	0.2781	-1.4199
	(0.686)	(0.036)*
R2	0.2625	0.0883

PEI		
Variable	7 Day Prior	28 Day Prior
WSB Posts	-0.0499	-0.0607
	(0.149)	(0.094)
WSB Likes	0.0001	0.0000
	(0.214)	(0.499)
WSB Comments	-0.0003	0.0007
	(0.608)	(0.316)
YC 1 Month	-0.0103	-0.0262
	(0.629)	(0.712)
YC 10 Year	0.3782	0.6939
	(0.004)**	(0.000)**
Sector Growth	1.2715	-0.1377
	(0.037)*	(0.843)
S&P Growth	-0.4154	-0.0779
	(0.661)	(0.939)
R2	0.1310	0.0981

PETS		
Variable	7 Day Prior	28 Day Prior
WSB Posts	0.0343	0.0511
	(0.084)	(0.022)*
WSB Likes	0.0009	0.0004
	(0.001)**	(0.115)
WSB Comments	-0.0052	-0.0017
	(0.000)**	(0.246)
YC 1 Month	0.0088	0.0235
	(0.184)	(0.211)
YC 10 Year	-0.0388	0.1064
	(0.343)	(0.038)*
Sector Growth	-0.2664	-0.6597
	(0.43)	(0.042)*
S&P Growth	0.6713	0.6455
	(0.040)*	(0.04)*
R2	0.1337	0.0914

PLCE		
Variable	7 Day Prior	28 Day Prior
WSB Posts	-0.0523	0.0129
	(0.155)	(0.733)
WSB Likes	-0.0017	0.0014
	(0.082)	(0.162)
WSB Comments	0.0037	0.0002
	(0.201)	(0.957)
YC 1 Month	0.0076	0.0475
	(0.524)	(0.189)
YC 10 Year	0.1239	0.4422
	(0.082)	(0.000)**
Sector Growth	3.7861	-0.0525
	(0.000)**	(0.916)
S&P Growth	-2.0649	-0.4258
	(0.001)**	(0.478)
R2	0.4576	0.2169

PTON		
Variable	7 Day Prior	28 Day Prior
WSB Posts	0.0002	0.0000
	(0.865)	(0.998)
WSB Likes	0.0000	0.0000
	(0.721)	(0.988)
WSB Comments	0.0000	0.0000
	(0.512)	(0.482)
YC 1 Month	-0.0018	0.0415
	(0.846)	(0.096)
YC 10 Year	-0.0931	-0.1707
	(0.105)	(0.011)*
Sector Growth	-0.1564	1.5788
	(0.673)	(0.000)**
S&P Growth	0.2819	-1.8240
	(0.560)	(0.000)**
R2	0.0174	0.1635

RH		
Variable	7 Day Prior	28 Day Prior
WSB Posts	0.0023	-0.0087
	(0.752)	(0.393)
WSB Likes	0.0001	0.0001
	(0.246)	(0.657)
WSB Comments	-0.0001	0.0002
	(0.592)	(0.475)
YC 1 Month	-0.0090	0.0425
	(0.135)	(0.068)
YC 10 Year	-0.0202	0.1663
	(0.567)	(0.006)**
Sector Growth	1.7987	0.1432
	(0.000)**	(0.63)
S&P Growth	0.1224	-0.5819
	(0.682)	(0.107)
R2	0.6954	0.1365

RVLV		
Variable	7 Day Prior	28 Day Prior
WSB Posts	-0.0129	0.0001
	(0.027)*	(0.983)
WSB Likes	0.0022	0.0004
	(0.006)**	(0.585)
WSB Comments	-0.0009	-0.0006
	(0.105)	(0.259)
YC 1 Month	0.0071	0.0256
	(0.449)	(0.363)
YC 10 Year	0.1489	0.3528
	(0.008)**	(0.000)**
Sector Growth	1.3446	0.8691
	(0.000)**	(0.016)*
S&P Growth	-0.2505	-1.1047
	(0.597)	(0.014)*
R2	0.3146	0.1790

SCVL		
Variable	7 Day Prior	28 Day Prior
WSB Posts	0.0054	0.0923
	(0.869)	(0.012)*
WSB Likes	-0.0003	-0.0001
	(0.397)	(0.886)
WSB Comments	-0.0003	-0.0028
	(0.888)	(0.164)
YC 1 Month	0.0097	0.0472
	(0.433)	(0.077)
YC 10 Year	0.0000	0.3651
	(0.999)	(0.000)**
Sector Growth	1.9870	0.3759
	(0.000)**	(0.281)
S&P Growth	0.1955	-0.3388
	(0.634)	(0.423)
R2	0.6165	0.1944

SE		
Variable	7 Day Prior	28 Day Prior
WSB Posts	0.0020	-0.0110
	(0.486)	(0.001)**
WSB Likes	0.0000	-0.0001
	(0.171)	(0.006)**
WSB Comments	-0.0001	0.0003
	(0.226)	(0.004)**
YC 1 Month	-0.0126	-0.0363
	(0.041)*	(0.160)
YC 10 Year	-0.1131	-0.0178
	(0.006)**	(0.746)
Sector Growth	0.8821	0.1681
	(0.013)*	(0.698)
S&P Growth	0.4462	-0.2765
	(0.187)	(0.494)
R2	0.3080	0.0739

SFET		
Variable	7 Day Prior	28 Day Prior
WSB Posts	-0.2393	-0.1551
	(0.033)*	(0.14)
WSB Likes	0.2716	0.1661
	(0.007)**	(0.078)
WSB Comments	-0.4098	-0.2533
	(0.007)**	(0.073)
YC 1 Month	-0.0051	-0.0905
	(0.605)	(0.002)**
YC 10 Year	-0.0803	0.1238
	(0.191)	(0.097)
Sector Growth	0.1882	0.1901
	(0.682)	(0.659)
S&P Growth	0.4329	-0.2635
	(0.408)	(0.599)
R2	0.1127	0.0994

SFIX		
Variable	7 Day Prior	28 Day Prior
WSB Posts	0.0093	-0.0063
	(0.099)	(0.252)
WSB Likes	0.0000	0.0000
	(0.231)	(0.700)
WSB Comments	-0.0007	0.0005
	(0.007)**	(0.038)*
YC 1 Month	-0.0088	-0.0038
	(0.455)	(.910)
YC 10 Year	0.1019	0.1416
	(0.152)	(0.098)
Sector Growth	1.2589	1.3157
	(0.007)**	(0.002)**
S&P Growth	-1.1517	-1.9095
	(0.055)	(0.000)**
R2	0.1441	0.1396

SIG		
Variable	7 Day Prior	28 Day Prior
WSB Posts	-0.0242	-0.0198
	(0.142)	(0.265)
WSB Likes	-0.0001	0.0000
	(0.625)	(0.841)
WSB Comments	0.0001	0.0015
	(0.823)	(0.014)*
YC 1 Month	0.0228	0.0218
	(0.152)	(0.481)
YC 10 Year	0.3329	0.7326
	(0.000)**	(0.000)**
Sector Growth	1.8444	0.3579
	(0.000)**	(0.379)
S&P Growth	0.3909	-0.5424
	(0.468)	(0.275)
R2	0.5300	0.3549

SKT		
Variable	7 Day Prior	28 Day Prior
WSB Posts	-0.0186	0.0142
	(0.176)	(0.354)
WSB Likes	-0.0003	0.0001
	(0.408)	(0.826)
WSB Comments	0.0002	-0.0004
	(0.495)	(0.385)
YC 1 Month	-0.0192	0.0673
	(0.039)*	(0.042)*
YC 10 Year	0.3687	0.5816
	(0.000)**	(0.000)**
Sector Growth	2.0707	-0.6744
	(0.000)**	(0.036)*
S&P Growth	-0.8358	0.3935
	(0.045)*	(0.404)
R2	0.5252	0.3530

TDOC		
Variable	7 Day Prior	28 Day Prior
WSB Posts	0.0076	0.0012
	(0.010)**	(0.670)
WSB Likes	-0.0003	-0.0001
	(0.001)**	(0.509)
WSB Comments	0.0003	-0.0001
	(0.086)	(0.548)
YC 1 Month	-0.0268	-0.0492
	(0.000)**	(0.044)*
YC 10 Year	-0.1784	-0.2376
	(0.000)**	(0.000)**
Sector Growth	1.5812	-0.2694
	(0.000)**	(0.453)
S&P Growth	-1.3691	-0.2630
	(0.000)**	(0.445)
R2	0.2356	0.1815

TME		
Variable	7 Day Prior	28 Day Prior
WSB Posts	-0.0181	0.0018
	(0.092)	(0.877)
WSB Likes	0.0001	0.0000
	(0.099)	(0.896)
WSB Comments	-0.0002	-0.0004
	(0.652)	(0.289)
YC 1 Month	0.0159	-0.0043
	(0.006)**	(0.479)
YC 10 Year	-0.0956	-0.0047
	(0.005)**	(0.898)
Sector Growth	1.4382	0.5920
	(0.000)**	(0.108)
S&P Growth	-0.8289	-0.6546
	(0.007)**	(0.060)
R2	0.2230	0.0390

TXMD		
Variable	7 Day Prior	28 Day Prior
WSB Posts	-0.2439	0.0386
	(0.582)	(0.936)
WSB Likes	0.1923	-0.0417
	(0.641)	(0.925)
WSB Comments	0.0345	-0.0074
	(0.651)	(0.929)
YC 1 Month	-0.0198	0.0368
	(0.112)	(0.005)**
YC 10 Year	-0.1291	0.1059
	(0.083)	(0.188)
Sector Growth	-1.8519	-0.9041
	(0.004)**	(0.195)
S&P Growth	3.2505	0.8419
	(0.000)**	(0.199)
R2	0.2095	0.0528

W		
Variable	7 Day Prior	28 Day Prior
WSB Posts	0.0014	0.0021
	(0.574)	(0.366)
WSB Likes	0.0000	0.0000
	(0.620)	(0.577)
WSB Comments	-0.0002	-0.0002
	(0.194)	(0.266)
YC 1 Month	0.0064	0.0984
	(0.657)	(0.008)**
YC 10 Year	-0.2385	-0.0148
	(0.006)**	(0.891)
Sector Growth	3.4877	-0.8970
	(0.000)**	(0.058)
S&P Growth	-1.3607	0.7236
	(0.064)	(0.215)
R2	0.4161	0.1065

WLL		
Variable	7 Day Prior	28 Day Prior
WSB Posts	0.0146	0.0544
	(0.906)	(0.679)
WSB Likes	0.0013	0.0001
	(0.656)	(0.975)
WSB Comments	-0.0067	-0.0029
	(0.487)	(0.772)
YC 1 Month	-0.0094	0.8517
	(0.980)	(0.48)
YC 10 Year	-1.4180	-4.1852
	(0.538)	(0.187)
Sector Growth	0.4933	-0.1286
	(0.932)	(0.984)
S&P Growth	-13.0243	0.3094
	(0.252)	(0.98)
R2	0.0184	0.0127

WPG		
Variable	7 Day Prior	28 Day Prior
WSB Posts	-0.0275	-0.0607
	(0.821)	(0.63)
WSB Likes	0.0017	-0.0126
	(0.911)	(0.426)
WSB Comments	-0.0025	0.0078
	(0.770)	(0.379)
YC 1 Month	-0.0465	0.0977
	(0.608)	(0.746)
YC 10 Year	0.2543	0.2892
	(0.643)	(0.700)
Sector Growth	2.3446	-2.0436
	(0.370)	(0.497)
S&P Growth	-1.5113	2.7705
	(0.711)	(0.527)
R2	0.0124	0.0120

X		
Variable	7 Day Prior	28 Day Prior
WSB Posts	-0.0047	-0.0126
	(0.230)	(0.042)*
WSB Likes	0.0000	0.0000
	(0.723)	(0.284)
WSB Comments	0.0000	0.0004
	(0.745)	(0.211)
YC 1 Month	-0.0010	0.0068
	(0.928)	(0.795)
YC 10 Year	0.0851	0.4561
	(0.088)	(0.000)**
Sector Growth	1.9937	-0.4138
	(0.000)**	(0.197)
S&P Growth	-1.2307	0.6414
	(0.001)**	(0.118)
R2	0.3563	0.2298

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