A Comparative Analysis Between the Influence of Social Media and Mass Media on the Stock Market

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ABSTRACT

Now more than ever, the media has an active role in an investor's life. From traditional news coverage to social media networking sites, news on the stock market spread within seconds. With Reddit and Twitter's active role in company news, stock price movements can be exponential in short periods of time. This study analyzes the influence between social media and mass media on the stock market, by comparing its volatility returns with that of the markets. News articles and social media posts were collected through a series of coding bots that only chose sources with high viewing rates. Also, sources from the past few years were chosen due to their impact on the study. With these sources, I analyzed the volatility of the stock throughout a period of five trading days. Then compared the volatility of each stock to that of the Standard and Poor's 500 in the same period. Moreover, further research investigated investors' sentiment towards the media through a questionnaire. The study found how both mass media and social media affect the markets constantly; however, social media has a greater impact than mass media when comparing the volatilities and percent changes.

Introduction

The need and the pursuit for profits is an occurring component in the life of a stock investor. The stock market, which is traded around the globe, has an enormous impact on the global economy. Stock exchanges such as the NASDAQ (National Association of Securities Dealers Automated Quotations), and the NYSE (New York Stock Exchange) are the most traded stock exchanges in the world. As of August 2021, the NYSE traded an equity market capitalization of over 26.6 trillion U.S. dollars, while in second place, the NASDAQ traded an equity market capitalization of over 23.4 trillion U.S. dollars (Statista.com, 2021). According to a study done by Gallup, in a recent poll conducted in April and July of 2021, 56% of Americans have money invested in the stock market (Gallup, 2021). Typically, the goal of an investor is buying a stock at a low price and selling that share at a price higher than it was bought; however, there are many ways of investing in the stock market. Trading options and short squeezing have gained a lot of popularity in the investment world, having higher volatility rates on the return of the investment. Therefore, the ability to predict the price of a stock is essential and allows for traders to earn the maximum amount of return on the investment. Today, investing in the stock market is shaped by many distinct aspects. For example, the Covid-19 pandemic has had a profound impact on the economy. According to a study done by Cerulli Associates, day trading "increased dramatically" in Q1 of 2020 compared with 2019. Furthermore, the financial online stockbroker TD Ameritrade reported that the website's introduction and instruction on trading stocks quadrupled during the beginning of the pandemic and the lockdowns compared to January 2020 (Annie Nova, 2020).

Moreover, the news about the economy and the company itself also plays a critical part in influencing the stock market. News networks such as *CNBC, CNN Money, Fox Business, The Wall Street Journal, The Economist, The Motley Fool, Bloomberg,* and *Yahoo Finance* are some of the most reliable sources when referring to economic-related news. Usually, investors look for advice on most of these news networks in which

they interpret and read articles related to their future or present investment. In addition, investors also refer to the SEC (Securities and Exchange Commission) (Securities and Exchange Commission) and the FOMC (Federal Open Market Committee) which are committees and agencies that oversee and enforce regulations on market manipulation and operations to invest in the market. These committees and agencies are the most authoritative and complete resource for all earnings reports. All publicly traded companies in the U.S. are legally mandated to declare quarterly reports, annual reports, and 10-Q and 10-K reports, which include the company's performance and information during that period. The most common and trustful source that investors use is the SEC's EDGAR system, which publicizes each company's reports (Ross, 2021).

Another way in which investors can gain information about the market is through social media. Different social networking sites like Instagram, Facebook, Twitter, Discord, and Reddit, are some of the biggest networking sites. Investors look to these sites for open-based discussions, and advice on the market. Therefore, the opinion, statistics, reports, and advice given by mass media and social media both affect the market's movement. By analyzing the attitude and reports of mass media and social media we can determine and correlate the influence each type of media has on the stock market.

Literature Review

Similar Studies

Studies regarding the impact of social media on the stock market have been scarcely done. However, there have been numerous reports and studies done on the impact of mass media on the stock market. André Kostolany, a famous intellectual investor, economist, and philosopher who made most of his fortune investing in the reconstruction of Germany after WWII, once stated "Facts only account for 10% of the reactions on the stock market; everything else is psychology." There is no better phrase to describe how the stock market, or any other financial market, reacts than the one stated by Kostolany. This refers to the volatility of the rise and fall of the markets and the psychological attitude of an investor towards the market.

A study done by Peiran Jiao, André Veiga, and Ansgar Walther in 2020, focused on the effect on stock volatility and turnover of coverage by traditional news media and social media. This study was one of the first studies to compare news and social media and their effect on the market. The researchers found that high social media coverage predicts high following return volatility and trading activity at the stock level, whereas high news media coverage predicts the opposite (Jiao, Andre, Walther, 2021).

Furthermore, a study on the effect of mass media on the stock market by Paul C. Tetlock finds that high media pessimism predicts a downward pressure on market prices which is then followed by a reversion to fundamentals. In contrast, remarkably high or low pessimism predicts a high market trading volume. Tetlock uses the *Wall Street Journal* to measure the quality of the media's interaction with the market (Tetlock, 2007). Although Tetlock's research does not focus on or discuss the topic of social media, his study on the effect of mass media does help instigate my research on that part of my research.

One study on social media and its effect on the stock market was done by Michael Lubitz. Lubitz was able to evaluate the sentiment under the financial news subreddit on the social networking site Reddit. Lubitz calculated the sentiment by using a dictionary-based approach and model. This allowed him to perform a weighted sentiment calculation and compare it to the Financial Times articles which are considered mass media based. The study found that the imminent power of Reddit is slightly better than the standard mass media news. Lubitz was able to achieve a 56.49% accuracy rate in predicting the future direction of the market (Lubitz, 2017). Moreover, as a result of the study done by Lubitz, we can infer that Reddit has the capacity and certain power to predict stock index movements.

As we can infer from the studies mentioned above, the media does have a role in how the stock market operates. In a more recent example, I was able to see firsthand how social media can exponentially affect anything. From the months of January to February 2021, there was a series of scandals involving the social media networking site Reddit and the world-renowned stock exchange Robinhood, in which users involved in the forum r/WallStreetBets, pumped up the price of several stocks which drove most of them to all-time highs and over double the price of the stock in each trading day. These stocks included GameStop (GME), AMC Theaters (AMC), Nokia (NOK), and BlackBerry (BB). For instance, at the start of 2021, GameStop was trading at under 20 dollars a share, and by January 27 the stock rose to nearly 350 dollars. Redditors and the short-squeezing strategy that they pursued are partly to blame for the stock's volatility. This forced many halts in trading including the famous stock exchange Robinhood suspending the exchanges of several of these stocks. As stated by Emily Stewart, a reporter and economical professor from ABC News, "It's a captivating David vs. Goliath story, where David — at least on some fronts — appears to be winning." As described by Stewart, this series of scandals is a battle between Wall Street and Hedges and the average day trader.

Although the multiple studies and research mentioned above show analysis of the effect of social and mass media on the stock market, there still is a significant research gap in the effect a type of media might have on a specific stock. The studies mentioned above usually compare their study to an index fund, these include the DOW (Dow Jones Industrial Average, DJI), or the S&P 500 (The Standard and Poor's 500) which are stocks that are focused on entire indexes. For example, the DOW is a price-weighted measurement stock market index of the 30 most prominent companies listed on stock exchanges in the United States. In comparison, S&P 500 is a stock market index that tracks the performance of the 500 largest companies listed on stock exchanges in the United States. While these indexes are referred to as "the market" and are considered by some economists as the backbone of the economy of the United States, there might be significantly little to no volatility or impact created by social media or mass media. This is because since the indexes contain strong and many companies, that is some get impacted by the news, it will have almost no impact on the entire index. Therefore, in my research, I will focus on certain stocks and use the S&P 500 as a constant to compare the volatility and impact the news had on that singular stock. However, to reach a clear conclusion, I must also compare how each investor differs from one another and analyze their behavior of relatedness between the stock market and the news media or sites they listen to and get their information from.

Hypothesis

Prior to conducting my research, I supported the hypothesis that there is a strong influence between the media and the stock market. Whether it is mass or social media, they both play a huge role in how the market reacts and moves. Nonetheless, due to the major scandals and forms of manipulation in the stock market that occurred in February 2021, I was able to theorize that social media such as Twitter, Facebook, Instagram, Reddit, and Discord, affect the way the stock market moves, and have a significantly bigger impact on the market than mass media. However, during certain periods of time such as earnings weeks, mass media outlets also have a significant role in the stock market due to the FOMC and SEC reports and meetings.

Methodology

Due to many implications and limitations that apply to my research, my forms of acquiring data differ in diverse ways. There are two ways in which I collected research, surveying, and analyzing graphs. For surveying, I chose to examine different age groups and asked many questions about their contributions to the stock market and how they gather their news. My other form of collecting research was analyzing graphs of the different indexes and companies which are mentioned in the data below. While comparing each publicly traded company, I will use the Standard and Poors' 500 (SPY500) as a constant to measure the volatility of each period. This way, I

can compare how different age groups interact with the distinct types of news, and how they correlate with the stock market and its volatility due to news outlets.

Surveys

For surveying and collecting data from different age groups, I created a google form with different analytical questions that allowed me to determine each trader's attitude towards the market. During the preliminary stages of my data survey collection, I was skeptical about the research and data I was collecting. This was due to several factors including a small number of responses and a lot of responses being invalid due to the people being surveyed not being interested in or invested in the stock market. Moreover, there were a variety of limitations that did not aid my research such as the audience I was surveying. The age, economic, social, and political stand groups all affect a person's investment and thus it interferes with my survey. However, according to Julie Ponto, survey research is a valid and helpful kind of investigation that offers several advantages in terms of describing and exploring variables and constructs of interest. Survey research, like any study, has the potential for a range of causes of error, but there are numerous ways for minimizing this risk (Ponto, 2015). Therefore, I decided to create several strategies to help my research be as unbiased as possible.

Due to the new strategies that I was implementing in my method of collecting and surveying people, I decided to reset and restart my survey from zero. These strategies were mostly directed in the collecting part of my survey. I changed the way I sent and spread my survey to the different people I was trying to analyze. With the help of my parents and grandparents, I was able to distribute my survey to a variety of different people with a different age group than I was surveying. My parents allowed me to collect about fifty responses from the age groups of 31-50 and 51-75, while my grandparents also helped me in collecting about forty responses from the age groups of 51-75 and 75+. This was a complete change from what I had surveyed in my early days of surveying. Moreover, I also implemented some social media strategies to help me survey and analyze more people. With the help of Discord, WhatsApp, Instagram, and Snapchat, I was able to spread my survey around different people with diverse backgrounds. For example, using the popular social networking site Discord, I published a survey question in the form of a chat discussion, in the famous group Only Options Trade, a group that educates about trading in the market, allowing me to collect several responses from people around the world. This allowed me to collect over one hundred responses from people in the age groups of 18-30 and a small fraction from 31-50. Apart from the change in distribution, I specified and made my survey more specific to be able to analyze and collect the data more efficiently. The survey I constructed is published in the next few pages.

Analytical Survey of the Stock Market
1. Email
2. Do you have investments in the stock market? (If not disregard the rest of the questions.)
- Yes
- No
3. Select your age group
- 18 - 30
- 31 - 50
- 51 - 75
- 75 +
4. How much cash/investments do you have in the stock market?
- $1,000 - $9,999
- $10,000 - $49,999
- $50,000 - $99,999

- $100,000 +
5. Are you an avid Day Trader? Do you trade Options?
- Yes
- No
6. Do you believe that news affects the way the stock market moves?
- Strongly Agree
- Agree
- Somewhat Agree
- Somewhat Disagree
- Disagree
- Strongly Disagree
7. Does the news you listen to affect the way you trade?
- Yes
- No
8. Do you get your news or are part of a social media group in Instagram, Twitter, Reddit, Discord, etc. Or do you listen to mass media like CNN, Bloomberg, Fox, or MSNBC?
- Social Media
- Mass Media
- Both
9. Please state the places where you got your information from.

Survey 1. A comparative analysis between the influence of social networking and mass media on the stock market. Please select one answer per question unless it specifies to select several.

Analyzing Mass Media and Social Media News Sources

Apart from comparing different people and their attitudes towards their investments in the stock market, and how they relate to the different news sources; the most important part of my research is comparing the different forms of news and comparing their change with respect to time of the selected stock, sector, or index. Furthermore, the news sources which I chose to collect were CNBC Breaking Business News, Bloomberg: Business News, Fox Business, The Wall Street Journal, and Yahoo Finance. For the social media sources, I choose to analyze Reddit, Discord, Twitter, and Instagram, each with their separate groups and financial accounts related to the stock market. In order to analyze each news source, I produced a strategy to collect these sources to effectively analyze them.

To begin, I started with old news articles from different news sources and started to collect data. I would go from source to source searching up whenever something about a selected stock was said. The inclination of positivity or negativity of the report did not matter, since I was just trying to find a correlation between the two: positive or negative. My process for collecting data from social networking sites differed a lot from my news article process. For example, for Reddit, I collected data from the subreddit r/wallstreetbets and r/stocks. Like Reddit, I also used a bot for Twitter to collect and send notifications whenever there is a continuous discussion in the Twitter groups such as Fintwit and 007Stocks. For Discord, I collected data from the Only Options Trading Group, and several other active and enormous market-related groups. Also, with the social networking site Instagram, I was limited to collecting data, however, I decided to just follow up on big investing accounts. After finding the exact and useful news source articles, and information that I needed, I recorded the period, title, specific stock or sector, and news source that I collected into Excel. After I finished collecting the old news sources, I referred to my data and analyzed the selected stock with a 15min candle variation, and considered the volume, volatility, and performance of the stock. After analyzing the past news

articles, I decided to view the present and future news sources and repeated the same steps shown above. However, there was a problem with my way of collecting the news articles since I was covering a substantial number of sources and did not know when they were going to release a publication. Therefore, I created the following strategies and bots in order to notify me whenever a news source made a publication.

Social Media

- Discord: Used the bot API downloaded from the discord.js bot library to receive and store notifications of the discord server. This allowed me to select a special category in the server in which if a discussion or any information about a certain stock was published then it would add a notification and a description with the time and description to my log notes.
- Reddit: Used the !NotifyMe bot and the self-created bot by teleebrockett, tylerbrockett/Alert-Bot, which has the code available at https://github.com/tylerbrockett/Alert-Bot-Reddit. It recorded and sent out notifications for the subreddit r/stocks, and r/wallstreetbets.
- Instagram and Twitter: Activated push notifications to be able to record the data.

Mass Media

- CNBC Breaking Business News: Downloaded the CNBC: Stock Market and Business app and allowed for notifications to be sent to my phone. I also used https://www.cnbc.com/latest/, the latest news covered by CNBC to have a more present look at my research.
- Bloomberg: Business News: Used the Bloomberg smartphone application to receive notifications and track the different articles.
- Fox Business: Downloaded the Fox Business application and created a watchlist with some of the largest traded stocks to receive news about them.
- The Wall Street Journal: Did the same as Bloomberg.
- Yahoo Finance: Did the same as Bloomberg.

At the end of each day or week, for each news source and or social networking site, I recorded every notification and chose the most important articles and discussions which I would then analyze with the market. I then added each log to excel with my past news articles and sources to have it all in one place.

Calculating Volatility and Percent Change:

In order to compare each stock and see if there was an actual slight change of movement due to the news, I had to calculate the volatility and price change of the SPY500 and compare them to the volatility and price change of the selected stock or sector. To find the volatility and price change of each stock, the following equations and methods where used were used.

Equation 1: Percent Change Formula.

$$\frac{Pp - Pcp}{Pcp} \times 100$$

Pp = Precent Price.
Pcp = Previous Closing Price.

Equation 2: Standard Deviation (Volatility) Formula.

$$\sqrt{\frac{\sum_{i=1}^{n}(x_i - \overline{x})^2}{n-1}}$$

$\overline{x_i}$ = Actual rate of return (the value of the ith point in the data set).
$\overline{x}$ = Average rate of return (the mean value of the data set).
n = Number of time periods (number of data points in the data set).

Results

Throughout the months of September to March, the data points from several news articles were analyzed. However, for the research dedicated to the social networking site discussion the dates researched date back to 2018. For each type of media, I analyzed and recorded the day, author and summary, stock, and neutrality of the article. I also recorded the stock price per share before the article was published, the price per share the closing day after the article or discussion was published, the moment time high (MTH) or moment time low (MTL) of the stock price per share 5 days after, the percent change to the MTH or MTL, and compared the percent change to the volatility of the SPY 500 that day. To find the volatility of the SPY 500, I used the equation to find the standard deviation and checked my results with a chart from SPGLOBAL.com. I used the chart from the S&P Dow Jones Indices, on the S&P 500 12-Month Realized Volatility Index to compare my results.

Furthermore, apart from analyzing all the data collected from my examination, I also compared how every age group reacts to the stock market based on the media. This is due to the survey which I did at the beginning of my research. With the results I collected from the survey I was able to compare each age group and how they use the media to invest in the stock market.

S&P 500 12-Month Realized Volatility Index

Table 1. Table 1 shows the Standard and Poors' 500 12-Month Realized Volatility Index.

Effective date	S&P 500 12-Month Realized Volatility Index	Effective date	S&P 500 12-Month Realized Volatility Index
9/30/2021	13.85	12/15/2021	12.87
10/1/2021	13.89	12/16/2021	12.9
10/4/2021	13.92	12/17/2021	12.93
10/5/2021	13.84	12/20/2021	12.97
10/6/2021	13.78	12/21/2021	13.09
10/7/2021	13.69	12/22/2021	13.12
10/8/2021	13.67	12/23/2021	13.14
10/11/2021	13.66	12/27/2021	13.2
10/12/2021	13.56	12/28/2021	13.18
10/13/2021	13.55	12/29/2021	13.18
10/14/2021	13.64	12/30/2021	13.18
10/15/2021	13.66	12/31/2021	13.17
10/18/2021	13.67	1/3/2022	13.1
10/19/2021	13.59	1/4/2022	13.08
10/20/2021	13.58	1/5/2022	13.21
10/21/2021	13.58	1/6/2022	13.13
10/22/2021	13.57	1/7/2022	13.12
10/25/2021	13.58	1/10/2022	13.11
10/26/2021	13.45	1/11/2022	13.14
10/27/2021	13.46	1/12/2022	13.14
10/28/2021	13	1/13/2022	13.21
10/29/2021	12.95	1/14/2022	13.19
11/1/2021	12.89	1/18/2022	13.3

11/2/2021	12.84	1/19/2022	13.26
11/3/2021	12.74	1/20/2022	13.31
11/4/2021	12.55	1/21/2022	13.44
11/5/2021	12.41	1/24/2022	13.44
11/8/2021	12.41	1/25/2022	13.49
11/9/2021	12.36	1/26/2022	13.24
11/10/2021	12.39	1/27/2022	13.22
11/11/2021	12.37	1/28/2022	13.29
11/12/2021	12.35	1/31/2022	13.33
11/15/2021	12.27	2/1/2022	13.27
11/16/2021	12.22	2/2/2022	13.31
11/17/2021	12.22	2/3/2022	13.49
11/18/2021	12.17	2/4/2022	13.5
11/19/2021	12.16	2/7/2022	13.48
11/22/2021	12.15	2/8/2022	13.51
11/23/2021	12.13	2/9/2022	13.58
11/24/2021	12.03	2/10/2022	13.7
11/26/2021	12.25	2/11/2022	13.83
11/29/2021	12.31	2/14/2022	13.83
11/30/2021	12.45	2/15/2022	13.92
12/1/2021	12.46	2/16/2022	13.92
12/2/2021	12.54	2/17/2022	14.08
12/3/2021	12.57	2/18/2022	14.08
12/6/2021	12.59	2/22/2022	14.11
12/7/2021	12.75	2/23/2022	14.19
12/8/2021	12.75	2/24/2022	14.05
12/9/2021	12.75	2/25/2022	14.21
12/10/2021	12.78	2/28/2022	14.02
12/13/2021	12.82	3/1/2022	14.08
12/14/2021	12.83	3/2/2022	14.14

(SPglobal, 2021).

Mass Media

Table 2. Table 2 shows the information collected and calculated for each Mass Media article. It includes the date, article, stock, neutrality, stock prices, percent change and volatilities.

Date and Time the Article was Published	Author, Article Summary, and News Source	Stock, Index, or Sector	Neutrality/Bias	Stock Price per Share Before ($)	Stock Price per Share End of Day ($)	Stock Price per Share MTH or MTL of the 5 Days Later ($)	Percent Change to MTH or MTL %	Volatility of the SPY500 Through Each Date

SEP 30, 2021, 2:50 PM EDT	Daniella Genovese, Sikorsky Completes New Armory, FOX	Lockheed Martin (LMT), Armory	Neutral - Neutral	348.37	348.11	350.21	0.53%	13.85
NOV 17, 2021, 12:12 PM EST	Dalvin Brown, Adriano Marchese, Apple Innovation, WSJ	Apple (APPL), Technology	Neutral - Positive	144.33	145.91	166.7	15.50%	12.22
DEC 7, 2021, 9:02 AM EST	Todd Haselton, Apple Share Rising, CNBC - Morgan Stanley	Apple (APPL), Technology	Positive - Positive	169.41	171.21	179.74	6.10%	12.75
JAN 28, 2022, 4:55 PM EST (NTD)	Rebecca Elliott, Slow Production of Tesla, WSJ	Tesla (TSLA), Automotives	Neutral - Negative	846.25	937.11	945.17	11.70%	13.29
FEB 2, 2022, (NTD)	Nicolas Chahine, AT&T Big Potential Upside, Yahoo	AT&T (T), WIFI Service / Technology	Neutral - Positive	24.4	24.53	24.91	2.10%	13.31
FEB 4, 2022, 2:38 PM EST	Mark Gurman, Apple to Debut New Tech, Bloomberg	Apple (APPL), Technology	Neutral - Positive	173.46	172.96	176.71	1.90%	13.5
Feb 5, 2022 (NTD)	Dom Calicchio, Halting of Ford Production, FOX	Ford (F), Automotives	Negative - Negative	17.95	17.26	17	-5.30%	13.48
FEB 11, 2022, 1:13 PM EST	Joe Deaux, Cleveland-Cliffs' Slowing	Cleveland-Cliffs Inc (CLF), Steel	Neutral - Negative	19.7	18.86	18.33	-7.00%	13.83

	Demand, Bloomberg							
FEB 15, 2022, 1:26 PM EST	Rebecca Elliott, Meghan Bobrowsky, Tesla Donation, WSJ	Tesla (TSLA), Automotives	Neutral - Neutral	918.71	922.14	927.07	1.00%	13.92
MAR 1, 2022, 11:14 AM EST	Jim Cramer, Trimming Nucor (Steel), CNBC	Nucor (NUE), Steel	Neutral - Negative	131.74	130.23	139.3	5.70%	14.08
MAR 1, 2022, 9:27 AM EST	Michael Wayland, Revenue Raise Stellantis, CNBC	Stellantis NV (STLA), Automotives	Neutral - Positive	17.7	16.75	16.65	-5.90%	14.08

MTH = Moment Time High

MTL = Moment Time Low

NTD = Next Trading Day

Social Media

Apart from my analysis of Mass Media Sources, I also recorded social networking sites and discussion groups. These included the sites Twitter, Reddit, and Discord. The following data dates to April 2018 due to several specific events that occurred on that day. The analysis can be seen in the following table.

Table 3. Table 3 shows the information collected and calculated for each Social Media source. It includes the date, article, stock, neutrality, stock prices, percent change and volatilities.

Date and Time	Author, Summary, Social Networking Site Discussion	Stock, Index, or Sector	Neutrality/ Bias	Stock Price per Share Before ($)	Stock Price per Share End of Day ($)	Stock Price per Share MTH or MTL of the 1- 5 Days Later ($)	Percent Change to MTH or MTL %	Volatility of the SPY500 Through Each Date
Apr 1, 2018, 6:02 PM (NTD)	Elon Musk, Tesla Going Bankrupt (April	Tesla (TSLA), Technology	Negative - Negative	53.36	50.34	48.76	-8.62%	12.12

	Fools), Twitter							
Jan 12, 2021	r/WallStreetBets, GME Best Ever Short Squeeze, Reddit	GameStop (GME), Retail	Positive - Positive	19.93	31.21	45.81	129.85%	34.75
Jan 14, 2021	OnlyOptionTrades, GME About to Explode against Hedges, Discord	GameStop (GME), Retail	Positive - Positive	37.77	40.3	77.39	105%	34.75
Jan 25, 2021, 7:00 AM (NTD)	r/WallStreetBets, Upcoming BB Short Squeeze, Reddit - Twitter	Black-Berry (BB), Technology	Neutral - Positive	13.94	17.77	29.1	108.76%	34.77
Jan 26, 2021, 6:00 PM (NTD)	r/WallStreetBets, Upcoming AMC Short Squeeze, Reddit - Twitter	AMC Theaters (AMC), Film	Neutral - Positive	4.88	19.92	20.5	320.08%	34.74
Jan 26, 2021, 4:08 PM (NTD)	Elon Musk, GameStonk!, Twitter - Reddit	GameStop (GME), Retail	Positive - Positive	80.62	149.01	488.7	506.18%	34.74
Jan 27, 2021, 8:30 AM EST (NTD)	r/WallStreetBets, Nokia Short Squeeze, Reddit - Discord	Nokia (NOK), Technology	Neutral - Positive	5	6.85	9.83	96.60%	34.82
May 1, 2021, 11:11 AM	Elon Musk, Tesla Stock is too High, Twitter	Tesla (TSLA), Technology	Negative - Negative	709.1	684.69	648.63	-8.53%	17.87

	Elon Musk, I propose Selling 10% of my Tesla Stock, Twitter	Tesla (TSLA), Technology						
Nov 6, 2021, 3:17 PM			Negative - Negative	1,222.31	1,167.51	982.04	-19.67%	12.41

MTH = Moment Time High
MTL = Moment Time Low
NTD = Next Trading Day

Surveying

Furthermore, as an additional correlation to my research, the survey which I created allows me to see how different age groups listen to news and use it to invest in the stock market. The results of the survey include the investment of each age group, and what type of media they listen to. The results are shown below.
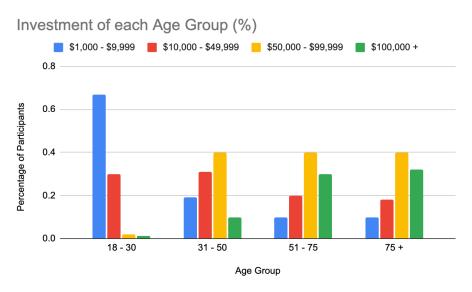

Figure 1. Portfolio Size/ Investment of each age group measured in percentage scale of 1.0.

Table 4. Which media do you listen to when referring to financial information?

Age Groups	Social Media	Mass Media	Both
18 - 30	15%	25%	60%
31 - 50	13%	67%	20%
51 - 75	5%	85%	10%
75 +	1%	90%	9%

Discussion

Implication

The implication of my findings is that due to the new generations that are going to be born and revolve around social media, the stock market is going to be exponentially impacted by social media in the years to come. This not only reflects my findings, which is that social media has a greater impact, but I can also correlate that to the fact that younger people would rather get their news and relate to social media more than mass media. Thus, the possibility of the market being significantly manipulated by an individual is extremely high. Famous political figures can use or be detected using the market in a series of illegal ways. These include insider trading, market regulation, government contracts, and market manipulation. Therefore, government agencies such as the U.S. Securities and Exchange Commission and Federal Open Market Committee should place more regulations or laws on the stock market to ensure that these implications will not happen in the future.

Limitations

The limitations that apply to my research vary from date and time, stock and/or index, volatility, and political and economic factors. To begin with, my first limitation is date and time. There are many times in the year when a company releases its earnings through a series of public reports. These earning reports are publicized in the SEC's EDGAR system, which accounts for a method of mass media; however, as I implied in my hypothesis this limitation was considered. Furthermore, economic and political factors also affected the data collected for my research. At certain periods of time throughout the collection of my data, political and economic factors such as sanctions and government contracts affected certain stocks and indexes throughout the market. For example, sanctions placed by a government on a certain company caused the volatility of its stock to be unpredictable and unusable. Also, government contracts to companies in certain work fields such as security stocks like Lockheed Martin allowed for its price to increase.

Finally, the most important limitation that applies to my project is the volatility of the market. The pace at which the price of a stock rises or falls over a certain period is known as volatility. More stock price volatility frequently translates to higher risk and aids an investor in predicting future variations. There are many varied factors that affect volatility, these include political, economic, industry, sector, and company performance. Therefore, volatility affects the way the market moves. Thus, there is a possibility on certain days where the volatility of the market, which in this case is represented by the volatility of the SPY 500, is high, then my research could alter due to this reason.

Conclusion and Further Studies

As examined from the data collected above, the statistics state and show that both mass media and social media affect the stock market. However, the data does show that social media has a bigger and more exponential effect on the market. In comparing the percent change of the MTH or LTH with the volatility of the SPY500, there is a greater gap and space between the percent change of the stocks that had an article on social media than the ones in a mass media network. For example, the most notable percent change recorded in our study was in the social media Twitter post, "Gamestonk!" by Elon Musk. Here we saw a percent change of 506% during its MTH throughout the five period, compared to a 34.74-point volatility in the SPY500.

Apart from the statistical evidence found, we also found a correlation between the different age groups that use either social media or mass media when needing financial advice. In the study we found that the younger population referred to Generation-z and Millennials both use social media to an enormous extent whenever referring to financial advice. Due to this, for further studies, I would recommend other researchers look at the impact of Reddit more than any other social media since it is primarily used by the Millennial and Generation-z age groups. Not only that, but Reddit does have a bigger effect than other social media platforms.

Furthermore, in any other future study, one should also make a revision of political and economic factors and how these affect the market. As mentioned in my limitation, some examples of the revision of these factors include sanctions placed by governments and government contracts with publicly traded companies. This way one could analyze the impact of how political and economic factors play a role in the Stock Market. Furthermore, one should also review and conclude more rigorous research on the impact of earnings week on the market and how this correlates with the media. Lastly, I would recommend the use of quiverquant.com to any future researcher studying the effect of media and politics on the stock market. Quiverquant.com publicizes all the trades done by politicians of the United States including members of the House of Representatives and Senate. Although these trades are officially released to the public, Quiver Quant allows you to also see government contracts and social media discussions from Reddit all in one place.

To conclude, the notion and hypothesis of my research were proven by the data analyzed in the experiment. Therefore, social media networking sites such as Twitter, Facebook, Instagram, Reddit, and Discord have a significantly bigger impact on the stock market in the short term.

Acknowledgments

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