STOCK MARKET CRASH 2022- TWITTER TWEETS ANALYSIS

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Abstract:

The purpose of this study was to carry out a number of tasks for the information gathered on the subject of “Stock Market Crash in 2022." The study started with the collection of pertinent data needed for the analysis. Once the data was collected, data cleaning was done on the raw data to make the analysis more focused and topical. Sentiment analysis, polarity analysis, and topic modeling were undertaken as part of the analysis to investigate the thoughts of those who tweeted and to ascertain their perspectives on the anticipated stock market fall. We found that there were 11869 tweets with positive sentiment, whereas there were only 6582 tweets with negative sentiment. Additionally, it is evident from the polarity that "opinions are more prevalent than facts." Creating a limit loss threshold instantly is one of the most basic and effective ways. One can take this action to lessen the capital loss if the market index declines as a result of a market crash, or they can restrict participation during tumultuous periods to totally escape the damage.

1. PROJECT INTRODUCTION:

A stock market crash is a sharp and sudden decline in stock value brought on by hasty share sales by investors. As a result, other stockholders see their stock values decline and begin selling their shares to reduce their losses. People may ultimately lose a sizable portion of their investment.

A sharp decline in stock prices and panic are the two factors that lead to a stock market crash. This is how it goes: Stocks are tiny shares of a corporation, and those who purchase them profit when the stock's value increases. These equities' worth and price are determined by how well investors anticipate the company performing. Therefore, they sell that stock in an effort to exit the investment before its value declines if they believe the company in which they have invested is headed for trouble.

The stock market's benchmarks are all moving down as of May 16. The S&P 500 has lost more than 16 percent of its value since the year 2022 began, the Dow Jones has lost money for seven weeks in a row, and the NASDAQ has lost 28 percent of its value overall. What's behind the most recent decline in the stock market? Every stock market disaster has a lot of moving elements. To put it briefly, though, the Federal Reserve increased interest rates for the first time in years to slow the sharp increase in inflation brought on by supply chain disruptions and the ongoing conflict in Ukraine.

The key social and political reasons to be concerned about the stock market in 2022 are:

• **High inflation:** Due to the enormous rise in the cost of, well, everything—especially at the grocery store and the gas pump—caused by all those stimulus checks and supply chain problems, investors have become more cautious, and consumers have reduced their spending.

• **Rising interest rates:** Early in 2022, the Federal Reserve began hiking interest rates in an effort to combat inflation, and additional rate increases may be forthcoming soon. This would lower inflation, but it might also bring on another recession in the United States.

• **Tensions in Europe:** The globe was shocked by Russia's invasion of Ukraine, which could give investors indigestion in the coming months. The stock market, however, typically bounces back and reaches greater levels a year following significant historical or geopolitical events, if history is any guide.

Research Objectives:

• Examine the topics discussed in recent tweets about the 2022 stock market crash.

• Perform various tasks on this data source (topic modeling, sentiment analysis)

• Watch for developments in the news around the 2022 stock market catastrophe.

• Analyze the distribution of hashtags (related to the tweets).

Research Questions:

• Does the general public have a favorable, unfavorable, or neutral opinion of the anticipated crash?

• What precautions or preventive actions can be done to lessen the impact of the expected crash?

• What would happen, and how can individuals deal with the consequences?

• How will this crash affect the economies of the various nations?

Literature Review:

Does Twitter Affect Stock Market Decisions? Financial Sentiment Analysis During Pandemics: A Comparative Study of the H1N1 and the COVID-19 Periods

Using financial sentiment research, we can comprehend how the stock market is impacted by social media sentiment and vice versa. Combining lexicon-based research on financial Twitter accounts with fundamental and technical financial analysis by applying a date shift to tweets, we were able to calculate the connections between the polarities of financial market indicators and messages on Twitter. Days before and after the current posts on financial Twitter accounts, correlations were also found. Results demonstrate that during the COVID-19 pandemic and the H1N1 pandemic, the markets responded 0 to 10 days and 0 to 15 days, respectively, after

information was shared and distributed on Twitter. By employing SenticNet instead of other lexicons, we also discovered that our method is more effective at spotting significantly shifting relationships. SenticNet makes it feasible to find correlations even on the day that the Twitter posts were made. The New York Times, Bloomberg, CNN News, and Investing.com were the most popular Twitter accounts during the pandemic, and there was a strong correlation between emotion on Twitter and stock market activity. A shifted correlation analysis improves the lexicon-based technique since it can uncover latent or hidden connections in the data.

Volatility of the US stock market and business strategy during COVID-19

This study uses Event Study, Stepwise Regression, and Vector Autoregression (VAR) models to assess the effects of COVID-19 and changes in economic policy uncertainty (EPU) on the volatility of the US stock market. Three contexts—within the US, outside the US, and globally—

have been used to study the impact. This study discovers that the market reacts negatively to the release of new cases and death records while responding favorably to the announcement of a financial bailout. The US stock market is very sensitive to the COVID-19, as seen by the negative and severe impact of reported deaths and cases on the volatility of stock indices. EPU significantly and favorably affects how volatile the US stock market is. The variables for COVID-19, EPU, and volatility are cointegrated and move in a single direction. The US stock market is more exposed to COVID-19 than the rest of the globe, according to this study, which also takes into account whether a long-term relationship exists between the variables.

Impact of COVID-19 Cases, Deaths, Stringency and Vaccinations on the US Stock Market

In the long run, a nation's socioeconomic environment may have a substantial impact on the size and operation of its financial markets. This study intends to examine the long-term and short-term effects of COVID-19 cases, deaths, stringency index, and immunizations on the US stock market considering this. In this study, daily time series data from 22 January 2020 to 30 April 2021 were considered. The long-run and short-run relationships were examined using the ARDL bounds test methodology. According to our statistical evidence, immunizations have a favorable and significant impact on stock markets over the long term, whereas verified cases and stringency have a negative and significant impact. This suggests that any public health catastrophe, like a pandemic breakout, has a negative impact on the stock markets. The government needs to step

up its efforts to immunize its citizenry as soon as feasible. Market confidence is boosted by such epidemic recovery efforts. To properly protect the populace and avoid a decline in investor confidence, policymakers should take care while drafting contingency plans.

The Worst of The Stock Market Crash May Be Yet to Come, According to Wall Street's 'Fear Gauge' Signal

Many analysts are still unconvinced that a recession is imminent this year, despite the stock market having just had its worst quarter since the Covid slump two years ago. However, analysts are warning that as the Fed eases stimulus measures, the risks could keep increasing during the following year, portending more bad news for markets. A "particularly savage" end-of-month stock selloff was spurred by accumulating signs that the economy is weakening more swiftly than anticipated, Morgan Stanley analyst Michael Wilson said in a client letter last week, and it is probably not over yet. The S&P, which has already declined by 17 percent this year, may decline another 13 percent before bottoming out, according to Wilson.

2. METHODOLOGY:

We searched different websites with which we would be able to convey at most information and perform sentiment analysis. We found our data on the Kaggle website “Huge crash in the Stock market 2022 “. As part of data cleaning. Removed @mentions, hashtags, hyperlinks, www, pictures, and emojis and also removed stop words, and converted text to lower case.

Python sentiment analysis is a way of examining text to find the sentiment that is concealed therein. Combining machine learning and natural language processing allows it to achieve this (NLP). Using sentiment analysis, we can look at the emotions portrayed in a text. In our project we have used the pyLDAvis library to apply the LDA technique to extract topics from a given text data for topic modeling to analyze the unstructured text data that we have obtained from scraping tweets, we need to represent our text corpus(data/document) in a numeric representation that can be achieved by calculating Document Term matrix for our text corpus and we used TFIDF to generate scores for our matrix and all of this we did with the use of sci-kit learn library code.

Data Cleaning:

Data cleaning is the process of organizing and improving inaccurate, incorrectly structured, or otherwise unorganized data. To produce a successful code, certain alphabetic, numerical, and symbolic characters must be removed and included. Stop words were removed from this data clearance along with @mentions, hashtags, URLs, www, images, and emoji. Additionally, the lower case was applied to the text. The result of the coding was successful as a consequence. If this format is not followed, it could have a negative outcome.

3. DATA ANALYSIS:

Overview of Data Analysis:

We have used a variety of analytical tools to do our investigation, but we ultimately chose Python because of its more user-friendly interface. The analyses listed below have been done by us.

Word Frequency: A word cloud is a visual representation of text data, often known as a tag cloud or weighted list. The importance of each word is shown by its font size or color since words are often single words. Fortunately, Python offers a word cloud package that makes it possible to create them.

From the word cloud image analysis, it is evident that the most trending terms are “stockmarketcrash", "bearmarket", "market", "stock", "stockmarket", "crypto", "bitcoin", "crytocrash" and "inflation” which are considered to be repetitive concerns of people.

A stock market crash is said to become a bear market when prices continue to drop over time. It often refers to a situation where securities prices decline by at least 20% from recent highs due to pervasive despair and unfavorable market sentiments. (Sommer) Investors experienced their worst year since 1970 in June 2022. (Baker)

Any type of money (example: bitcoin) that operates digitally or electronically and employs cryptography to safeguard transactions is referred to as cryptocurrency or crypto. (Kaspersky) The larger economic decline had a role in what caused the latest crypto crash. (“After $2 Trillion Crypto Crash, What Happens Next?”) Due to growing inflation, a flimsy stock market, and rising interest rates, many investors are now feeling quite negative about the market, which also ultimately caused the bitcoin market crash in June 2022. (“Bitcoin Crash”)

Polarity sentiment analysis: The sentimental component of an opinion depends on the expression. Each entity in a sentence, document, or sentence can have its sentiment analysis outcome established in textual data. Positive, negative, or neutral sentiment polarity can be identified.

Subjectivity sentiment analysis: Defining opinions, emotions, and even emoticons in a corpus of texts is a major focus of sentiment analysis algorithms. From one technique to another, the spectrum of established attitudes greatly changes. The range of more sophisticated models is wider than the three fundamental polar emotions that a typical analyzer may specify (positive, negative, and neutral). Subjectivity measures how much factual information and subjective

opinion is present in the text. Because of the text's greater subjectivity, personal opinion has taken the place of objective knowledge.

Topic modelling: In order to automatically identify topics in text documents, topic modelling employs statistical and machine learning models. It is used for a variety of purposes, including identifying social media trends and breaking news, identifying fake users, customizing message recommendations, and describing information flow.

4. RESEARCH DISCUSSION

Findings:

• Since the dataset was entirely scraped from Twitter.com tweets sources, we are left with an unbalanced dataset where the positive number 11869 and the negative number 6582 reflect the double for our data's positive side.

• The Subjective Sentiment Analysis shows that more than half of our data is based on an Opinion which is one of the limitations of this analysis.

• Sample size is small and does not represent the majority

• We need to collect more data to have the correct information that will help us extract better insights because other global aspects were not considered in this data set.

• opinions are more prevalent than facts.

Practical Recommendations:

• Stock market collapses seldom occur over night, so all one must do is diligently monitor for the warning indicators, such as during times of geopolitical or disease upheaval and outbreaks. (“How to Avoid Stock Market Crash? Prevention Strategies”)

• One of the simplest and most useful strategies is to set up a limit loss threshold instantaneously. If the market index drops as a consequence of a market crash, one can do this to mitigate the capital loss. (“How to Avoid Stock Market Crash? Prevention Strategies”)

• Restrict participation throughout turbulent times. This approach involves absolutely no risk that may lead to one getting impacted by the stock market meltdown. (“How to Avoid Stock Market Crash? Prevention Strategies”)

• Yet another one of the greatest ways to avoid being impacted by the stock market crash is to be well-prepared in advance and take the appropriate measures beforehand. (“How to Avoid Stock Market Crash? Prevention Strategies”)

• Using a range of strategies, including analytical tools such as Tableau, Microsoft Power BI and different analysis methodologies like SWOT, PESTLE, and Porter's Five Forces, may help develop the understanding of the situation, ultimately assisting in identifying a solution. One or more such tools can be integrated for an optimal analysis outcome.

• To deal with the issue better, one should dig deep, keep themselves updated constantly, broaden their understanding of current trends, and make decisions in line with that analysis.

Study Limitations:

• One limitation is that the study and analysis were conducted on a moderate sample size, and it may not be representative of the majority.

• In the data more than half of the data was neutral which was not much use to do polarity and subjective analysis.

• The study did not offer more formal statistical analysis in order to strengthen the findings. Thus, the conclusion might be skewed and not supported by statistical data to some extent

Conclusion:

Our research project aim has been achieved with the determination of public sentiments about the stock market crash due to global events. We have also analyzed how the global economies have been impacted and resulted in the bear market situation. We also observed that this can be attributed to the ongoing war crisis between Russia and Ukraine and sanctions imposed on Russia and resulting in oil and fuel price hikes and shortages of crude oil supply from Russian soil. Thus, by considering the recommendations suggested the potential impact of this anticipated crash can be mitigated.

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