Challenging Traditional Risk and Valuation Models

Gamestop: A story of social influences on financial markets

By:
Muhammad Dosani
John Lardis

Project objective

Evaluation of tradition Investment valuation and Risk assessment models and strategies of Financial Institutions

1) Do historical evaluation and risk management models need to evolve?

2) Understanding how social media is influencing stock prices

Understanding the problem

01 The need for financial institutions to modernize their investment and risk management strategies and systems to factor in social Influences

02 How much can social media impact financial activity

03 What would have been the original forecasted stock price before the influences of social media

A snapshot

In what seems like a modern day twist to the Robin Hood story — a gaming company stocks had become a battleground between the rich and the poor with Reddit users attempting to bankrupt hedge fund managers.

US company GameStop is a brick-and-mortar video game retailer that has been struggling with profits due to store closures, decline in physical sales and the COVID-19 pandemic.

In January 2021, a short squeeze resulted in a 1,500% increase in GameStop's share price over the course of two weeks, reaching an all-time intraday high of US$483.00 as of January 29, 2021, on the New York Stock Exchange.

This effect was mainly attributed to a coordinated effort by the Reddit community r/wallstreetbets, a subreddit dedicated to stocks with high market risk. A surge in the stock price in extended-hours trading occurred after Elon Musk made a post on Twitter that included "Gamestonk!" (in reference to r/wallstreetbets) and a link to the community.

GameStop

Our Process

1. Financial stock price data analysis:
   a. Impact on stock price, financial returns and volatility
   b. Pre and post volatility MonteCarlo simulation
2. Social media mentions on GME:
   a. Data on GME Twitter mentions from Sproutsocial
   b. Google data analytics
   c. Intended to use Reddit API for data analysis
   d. Sentiment analysis
3. Correlation between GME stockprice changes vs increase in Gamestock mentions / conversation

Financial returns metrics

Mean returns 2017 -20: - 0.005%

Mean returns 2018-21: 0.008%

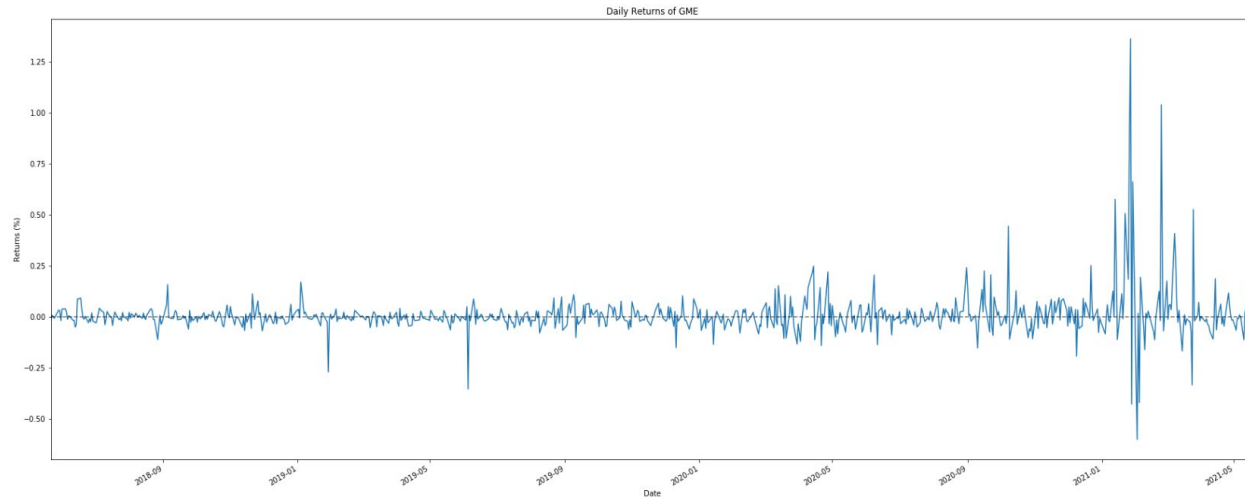**MonteCarlo Simulation 1:**

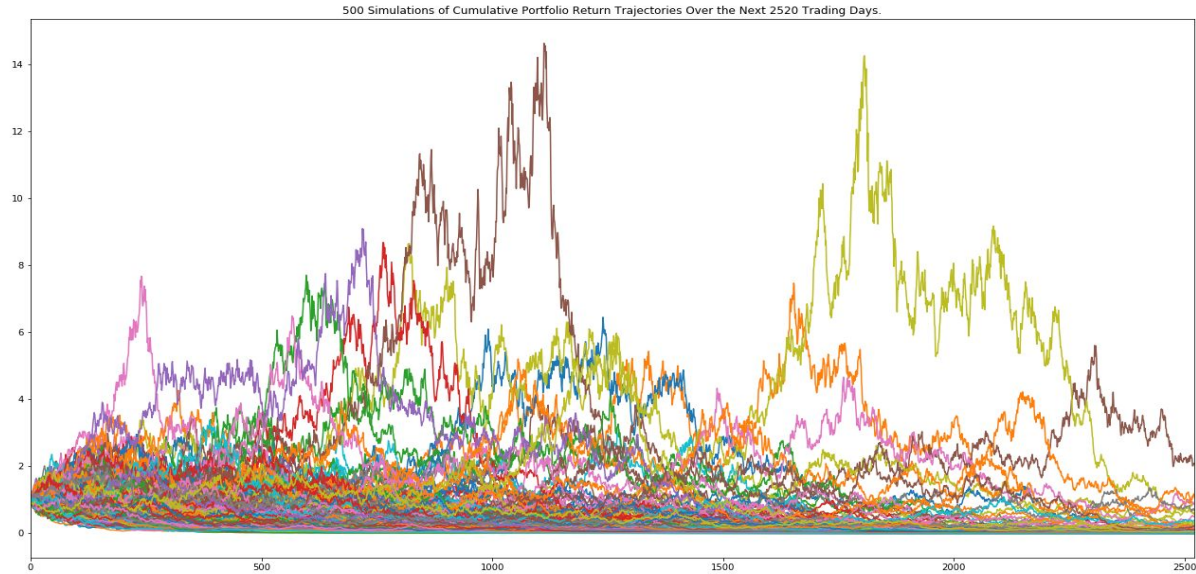**MonteCarlo Simulation 2:**

Mean = 0.023

Mean = 1.72e+08

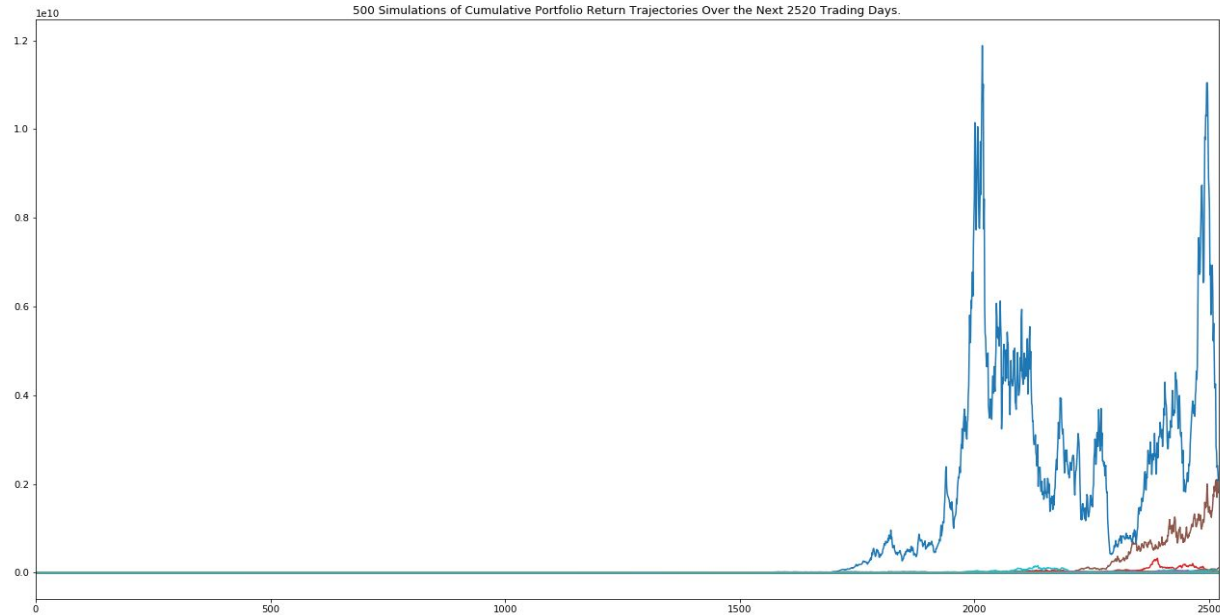Standard Deviation = 0.07

Standard Deviation = 2.52e+09

Financial Returns graph

Daily Returns of GME

MonteCarlo Simulation / Financial Projections

500 Simulations of Cumulative Portfolio Return Trajectories Over the Next 2520 Trading Days.

MonteCarlo Simulation / Financial Projections

500 Simulations of Cumulative Portfolio Return Trajectories Over the Next 2520 Trading Days.

Market Influences

Reddit: r/WallStreetBets

"DeepF*ckingValue"

Short sellers | Melvin Capital Management

Retail traders on Robinhood

Data on social media mentions

Example: January 20 - 27 2021

82000 Reddit mentions of GME, 1.5m tweets, 1,465 Youtube videos

All combined, these had a potential reach of 10 billion impressions and generated 12.8 million likes and shares

2,805% increase in topic volume

3,041% increase in potential reach

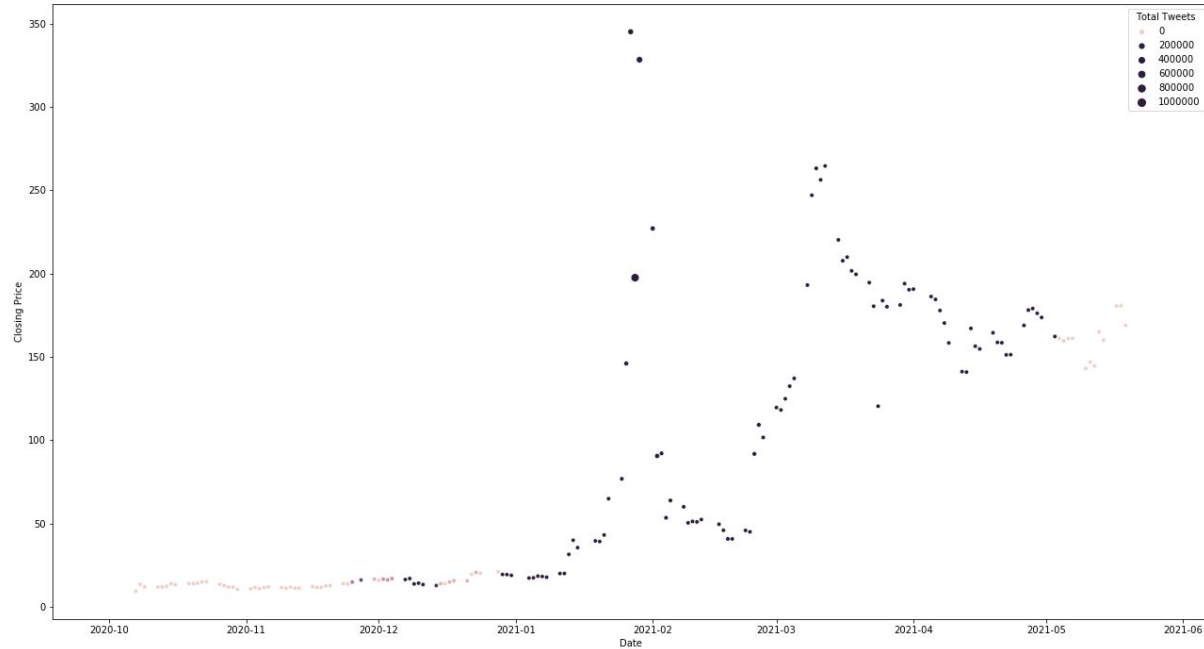4,521% increase in social engagements

Keywords:

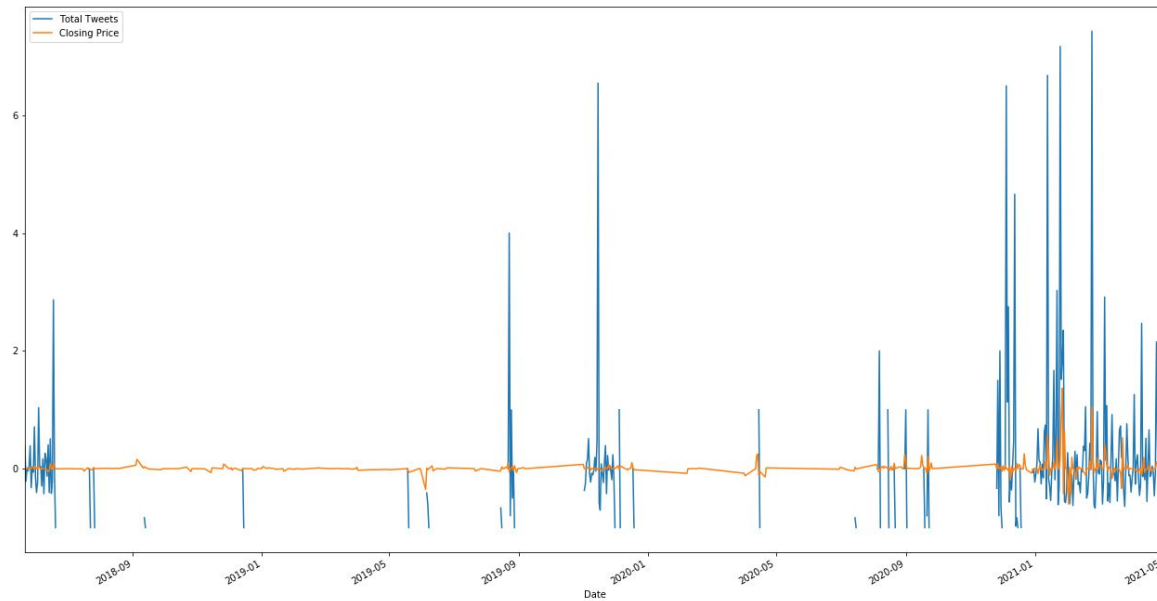Gamestop | Gamestonk | Gamestock | GME | r/wallstreetbets

source: sproutsocial

Social Media mentions and correlation to price

Social Media mentions and correlation to price

Stock price and Total tweets correlation / Daily pct change

Our Findings

- Financial data was clearly impacted
- MonteCarlo simulation pre and post volatility data presented wildly different returns
- Correlation of social media discussion vs stock price - What comes first?
- Absence of social media metrics and strategy in stock price analysis will affect the risk and valuation of stocks

Conclusions

- Traditional risk and valuation models and metrics haven't evolved with time
- New investment platforms available for eg Robinhood providing investment access to a wider group of people
  - Influenced by new forms of 'media' such as Reddit / Twitter etc
  - Various channels of information beyond Bloomberg, News channels etc
- New data suggests non financial data and related social metrics need to be incorporated in investment risk and valuation models for listed organisations
- Use machine learning for non-financial data to better understand sentiment and how it affects stock prices

Lessons learnt

- Access to APIs and the right set of data is needed for various social platforms
- Sentiment analysis / Machine learning would be beneficial to understand whether keyword mentions had a positive or a negative effect on price
- Data from various social media platforms (Reddit, Facebook, Youtube) would have provided deeper insights into our analysis
- Activities of key influencers and their role in price volatility
- Also, what causes the price volatility - Conversation on social media affects price vs price changes leads to more conversation? A bit of both perhaps