causaLens

Gamestop:
Short Interest Analysis

Introduction

In the past few weeks, the world of r\WallStreetBets and its fascination with ~~Gamestonk~~ GameStop has been thrust into the mainstream. The scarcely believable changes in price have had investors scrambling for an explanation. Ultimately the story revolves around the intricate cause and effect of short contracts on stock prices. In this document we analyse high-resolution short interest data from 2iQ with causaLens to understand the driving forces behind the GameStop phenomenon.

Data

We use data from 2iQ, the world leading provider of Insider transaction data and short interest rate data. Here we will focus on their fascinating daily short interest data, in particular there a few key quantities of interest (although many more exist):

- Utilization Rate: The percentage of shares available for shorting which have been shorted.
- Loan Rate Average: The average loan rate on issued contracts.
- Average Age: The average age of issued contracts.

Additionally, these quantities can be filtered by sub-contract type (i.e. whether cash collateral was used, whether the contract was overnight, what currency the contract was agreed in).

We will limit ourselves initially to a universe of 6 instruments, consisting of 4 "meme" stocks (GameStop, Tesla, AMC, and Nokia) popular with Redditors and 2 large stable companies (Google and Apple).

Recent Trends

To begin, we can dive into detail on the short contracts being issued. High interest rates typically indicate low investor confidence in the future price of the instrument. Examining the average loan rate on newly issued contracts, we can see that the loan rate of AMC and GameStop are exceptionally high.

Interestingly, the interest rates have been moving in opposite directions in response to the meme stock phenomenon. AMC interest rates have sharply risen whereas GME has fallen.
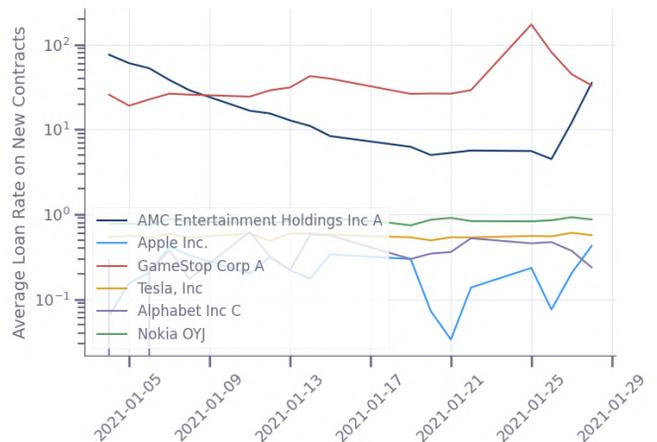

Next we can look at the number of newly shorted units which provides valuable information about new contracts being taken out. There are a few interesting things to notice here.

- There is a sharp increase in the number of units of Nokia being shorted.
- Other instruments have been largely stable despite the dramatic price changes.
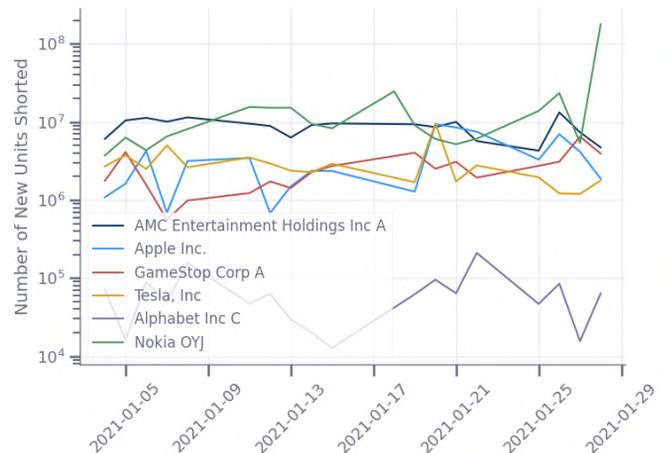
We can further dial in and look at specific contract types. Of particular interest are the number of contracts (weighted by total shares outstanding) using non-cash collateral.

These contracts are a useful indicator of the surge of retail investors into a stock, since non-cash collateral is typically used only by institutional investors. We can see below that the rapid rises in price in the Reddit meme stocks coincides with a drop in the ratio of contracts using non-cash collateral.
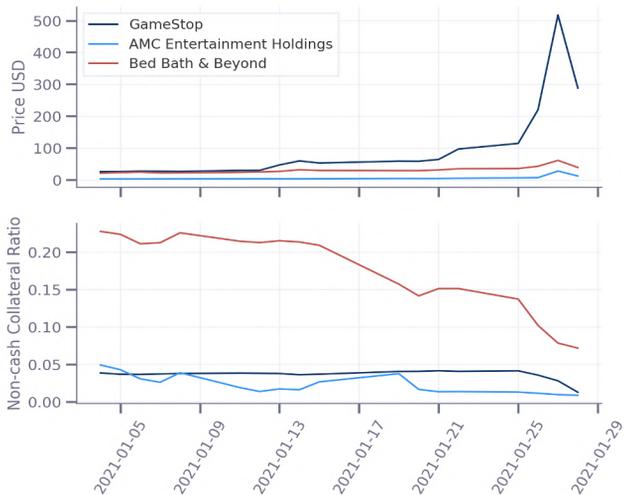

It's clear that there should be an important interaction between the loan rate and the utilization. As the stock becomes more highly shorted the loan rate will go up, making the stock more expensive to bet against.

In the figure below, we scatter the historical utilization and loan rate for over 4000 US instruments and highlight the instruments of interest. Interestingly, there is a clear distinction between the three regimes of stocks. AMC and GME occupy the top right corner of the plot. These high interest rate, high utilization instruments are particularly at risk of a short squeeze (other instruments in this region of the figure include
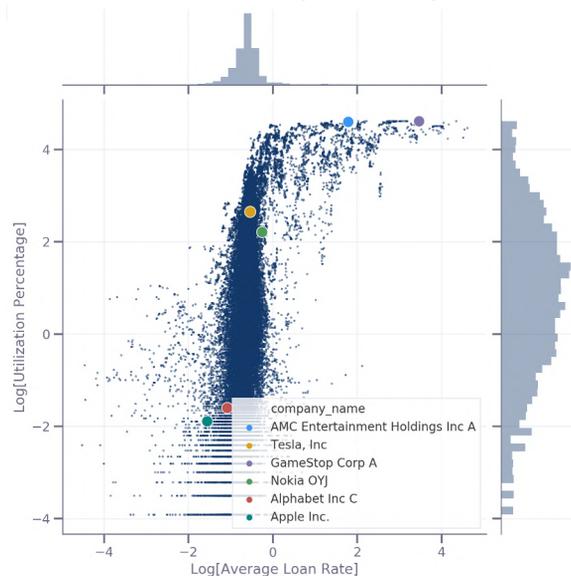

Lastly, we can look at the monthly volatility of returns for the highest utilized stocks versus the lowest utilized. We find that while the distributions of returns are generally similar, the highly utilized stocks have much higher volatility. This is caused largely by some extreme positive outliers, indicative of short squeezes.
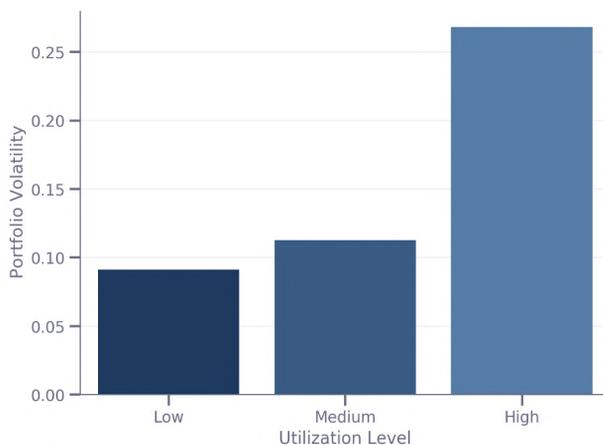

Viewing GME through a Causal Lens

causaLens is designed to identify optimal transformations and predictive causal drivers from time series data. By applying this platform to a panel model consisting of the meme stocks we can build a predictive model that leverages the four most significant causal relations, summarised in the graphic below.
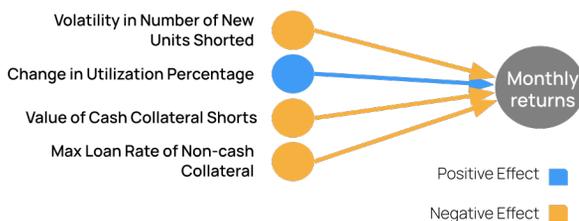
One of the top causal drivers is the volatility in the number of units shorted. By examining the relationship between this variable and price, we can see a clear story emerge.

The initial unexpected spike in price of GME in September 2020 generated a period of high volatility in Q4 2020 during which the price remained relatively stable (around $20). Then in December, we saw a dramatic fall in this volatility which was immediately followed by a huge surge in the price throughout January. Moreover, it was clear from the data as early as September 2020 that all the necessary conditions for a short squeeze were present. By contrast mainstream media attention in the stock didn't materialize until around the 25th January after prices had begun to surge.
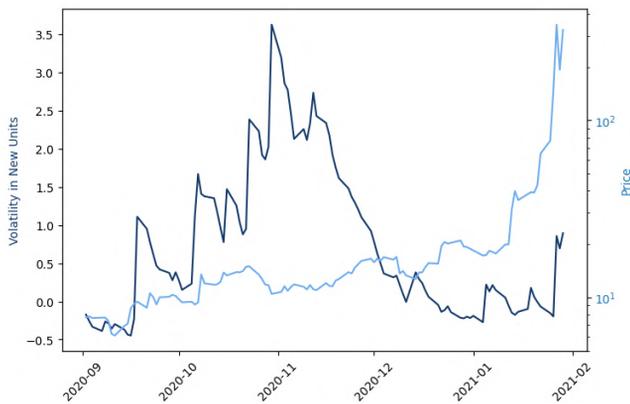
Using Short Interest Data to Trade

Causal AI has unique functionality in autonomously detecting causal relationships between variables and finding trading strategies to optimize business KPIs such as the Sharpe ratio.

To demonstrate this we can build a causal model for a larger universe of stocks (in this case over 500 European instruments). We then apply a simple strategy of going long on the top 20% of instruments and short on the bottom 20%.
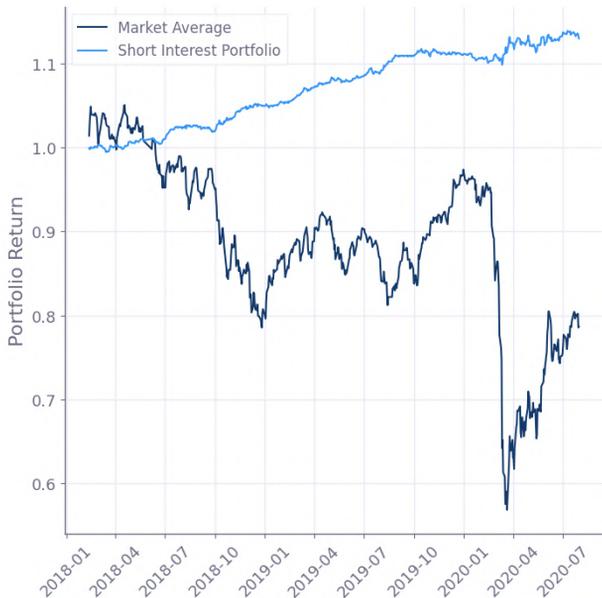
We find that implementing this model significantly outperforms the market average for these instruments. The portfolio has an overall Sharpe ratio of over 1.7 based only on signals from short interest data.

Conclusion

In conclusion, the unprecedented behaviour in meme stock prices can be more deeply understood by using Causal AI with high-resolution short interest data.

About Us

causaLens is pioneering Causal AI, a new category of intelligent machines that understand cause and effect - a major step towards true AI. Its enterprise platform is used to transform leading businesses in Finance, IoT, Energy, Telecommunications and others.

Current machine learning approaches, including AutoML solutions, have severe limitations when applied to real-world business problems and fail to unlock the true potential of AI for the enterprise. For instance, in the case of predictions, they severely overfit and do not adapt when the environment changes. causaLens' Causal AI Platform goes beyond predictions, providing transparent causal insights and suggesting actions that directly improve business KPIs.

causaLens is run by scientists and engineers, the majority holding a PhD in a quantitative field.

Contact us on info@causaLens.com or follow us on LinkedIn and Twitter.