QUANTITATIVE
FINANCE
SOCIETY

Intro to Short Selling

Brain Teaser

Question: What digit is the most frequent between the numbers 1 and 1,000 (inclusive)? What digit is the least frequent between the numbers 1 and 1,000 (inclusive)?

Solution: Brain Teaser

Answer: The most common digit is 1 and the least common digit is 0.

The digits 0 through 9 follow the same pattern. There is exactly 1 occurrence digit for every 10 numbers. For instance, the digit 2 appears once between 10 and 19 and once between 30 and 39. 2 also appears in 20, 21, etc… and 200, 201, 202, etc… The only difference for 1 is that 1,000 includes a 1, so there is a single extra occurrence (301 vs. 300).

The reason 0 has the least occurrences is because 0 doesn't have any equivalents to 22, 33, 44, 222, 333, etc…
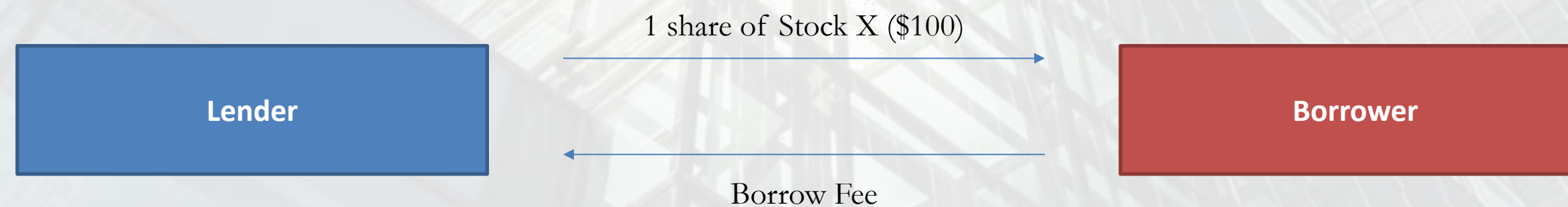
Short Selling

❖ Betting against an asset

❖ Short assets that you believe are overvalued

❖ Unlike traditional value investing, hedge funds tend to have much higher turnover with shorts and shorter time horizons

❖ How do we short/What is a short?

What does it mean to "Short"

- ❖ Borrow shares of a stock (or any asset)
- ❖ Sell them at today's value
- ❖ Pay "borrow", which is effectively the interest rate to the lender of the shares
  - ❖ Borrow is typically a couple % but can be much higher if you want to short a stock many other people are short
- ❖ Eventually have to buy back shares and return them to the lender

- ❖ In the example below, the borrower is short 1 share of stock X at $100

1 share of Stock X ($100)

Lender	→	Borrower

Borrow Fee

Risks of Shorting

❖ Market goes up over time
  ❖ 9% CAGR over the last 50 years

❖ Infinite Downside and Capped Upside

❖ Short Squeeze
  ❖ Short sellers need to buy stock to cover their position if margin called on a sharp increase, causing the price to increase more and forcing more to buy
  ❖ Margin Call: Broker can force you to buy back stock or put-up capital if the stock prices rises dramatically

❖ Recent Examples?

Melvin Capital - GME

- ❖ Long/Short Hedge fund, hailing from P72
- ❖ 53% loss in January 2021 due to Gamestop saga
- ❖ Number of extraneous factors, but shows the ultimate risk case when shorting
- ❖ Factors at play
  - ❖ Short Squeeze (and more)
  - ❖ Infinite Downside

Short sellers squeezed in crowded GameStop bet
Borrowed GameStop shares as % of outstanding

Source: IHS Markit
© FT

22.38 USD Apr 13, 2017

Why do we Short?

❖ Increase leverage
  ❖ When you short, you borrow a stock and sell, giving you capital you can invest for the time being with your "interest" being the borrow

❖ Generating "free" alpha

❖ Hedge
  ❖ Beta
  ❖ Factor/Pair Trades

❖ Generating higher fees (generalization)
  ❖ The best short-onlys can charge 30-50+ on the performance fee side
  ❖ P72/Multi-managers can charge 3 and 30, other hedge funds can't
  ❖ L/S can charge 2 and 20
  ❖ L/O probably can only charge 1 and 20 if not worse

Common Pitch Types - Shorts

❖ **Structural Share Donor**
  ❖ Brick and Mortar retail
  ❖ First-mover in high-growth industry without a moat

❖ **Frauds, Stock Promotions**
  ❖ Promotional management exaggerating company's prospects
  ❖ Accounting gimmicks / misrepresentations

❖ **Companies with crazy high-expectations, popular fads**
  ❖ Plant-based meat

❖ **Overearning Cyclical**
  ❖ Industry in an upcycle (demand outstripping supply in the short-term), yet the market assumes this upcycle will last forever
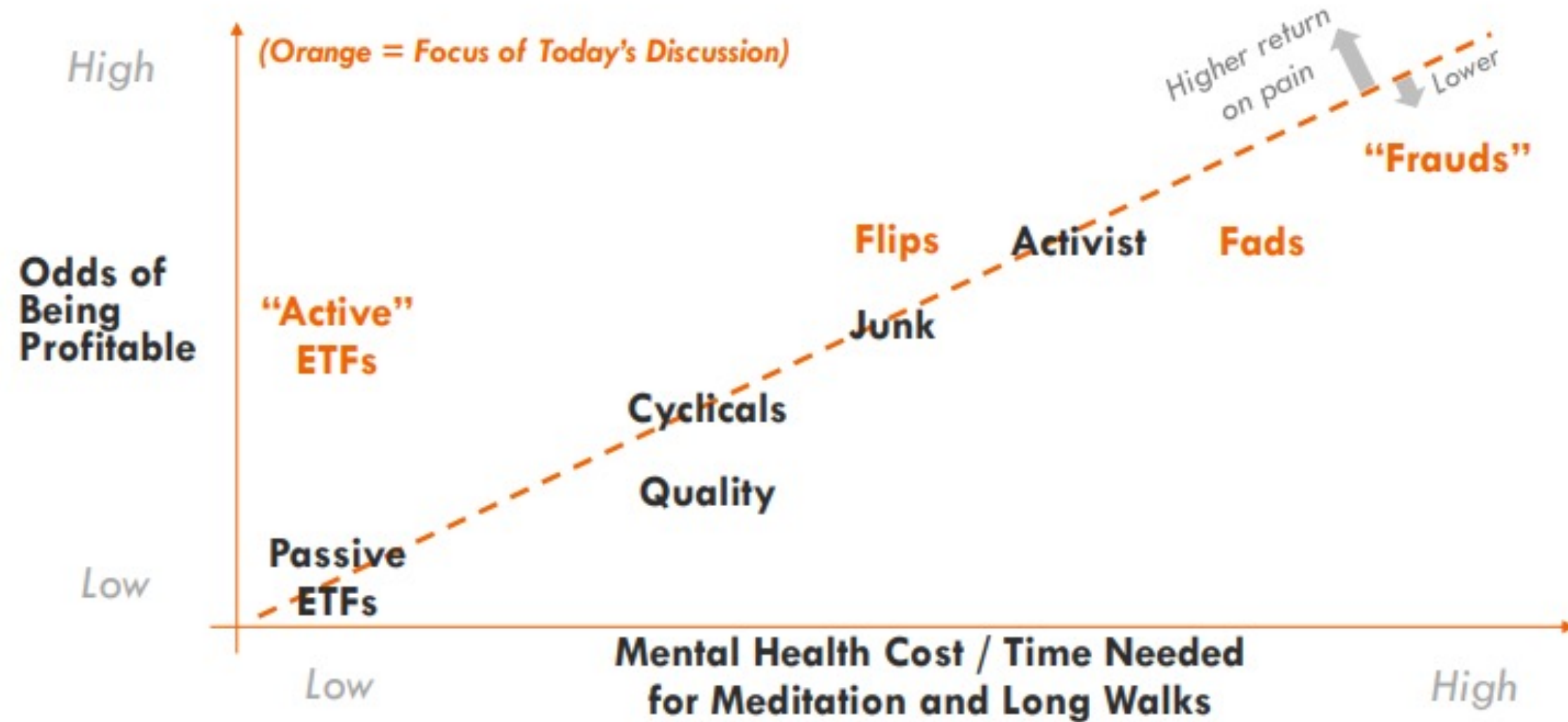
Bad Shorts

❖ **High Short Interest**
- ❖ Can work within reason if you are experienced
- ❖ Exposure yourself to "Gamestop" risk, however, if inexperienced

❖ **"Valuation Short"**

❖ **Lack of catalyst**
- ❖ Who are the holders? Lock-up expiry?
- ❖ Have to pay borrow in the mean time, cannot hold forever
- ❖ "The markets can remain irrational longer than you can stay solvent" – John Keynes

❖ **Shorts where the holders are not worried about earnings, etc**
- ❖ Tesla, Gamestop
- ❖ Can be confident they will miss on consensus revenue/earnings, and the stock will still fly up

UPSLOPE VIEW:
MAPPING OUT DIFFERENT TYPES OF SHORTS

(Orange = Focus of Today's Discussion)

Upslope Capital Overview (squarespace.com)

PILE UP THE RED FLAGS

Little, obvious lies	Constant restatements/ segment reshuffling	Leadership involvement w/past "scams"	Non-stop press releases with one-sided quotes	Fad-riders; name changers	Threatening shorts = dinner bell
Related party nonsense & weirdness	Aggressive & plentiful EPS adjustments	Unusually convoluted financials	Hazy organic growth definition/data	Celebrities/ politicians on BoD	Misc. accounting shadiness (cash never arrives, Mat Weaknesses)
Story & fin. model misaligned, for no obv reason	Shady promoters "like" and push it	CEO aggressively hitting podcast circuit	Mgmt touts insider buying to pump the stock	SPACs!	Just get to 0.5% of $5T TAM stories

Upslope Capital Overview (squarespace.com)

Case Studies

SPAC Stock Promotion: Rumble (NASDAQ: RUM)

Market Summary > Rumble Inc

4.83 USD

-4.99 (-50.81%) ↓ all time
Closed: Oct 27, 7:25 PM EDT • Disclaimer
After hours 4.90 +0.070 (1.45%)

+ Follow

| 1D | 5D | 1M | 6M | YTD | 1Y | 5Y | Max |

4.83 USD Oct 27, 2023

Open	4.99	Mkt cap	1.35B	52-wk high	13.55
High	5.03	P/E ratio	-	52-wk low	4.51
Low	4.80	Div yield	-		

Business Overview: Online video platform popular amongst American right-wing and far-right users.

Situation Overview: $3B de-SPAC on claim of rapid growth in MAUs from 1.6 million users in Q3 2020 to 80 million users in Q4 2022.

Thesis: We believe that Rumble has completely fabricated their user numbers. Activist Culper Research analyzed Similarweb, SEMrush, and app download data, which when combined, suggested that Rumble had overstated unique users by as much as 100%+ since the SPAC deal was announced. CEO Chris Pavlovski is highly promotional, claiming that Rumble had 100 million users in 2018, which was obviously not the case. Rumble's business model is also fundamentally flawed with negative and deteriorating gross margins: Rumble bribes large creators like Russell Brand, Andrew Tate, and iShowSpeed with massive multi-million dollar deals to join their platform, with little return on investment to show for it. Pavlovski continues to pander to a cult consisting of largely right-wing retail traders to keep the stock price afloat. Share lock-up for insiders expired in September 2023. We have been short and believe shares are headed lower.

Fraud & Overearner: American Addiction Centers (NYSE: AAC)

Business Overview: Network of rehab facilities with programs across the United States.

Situation Overview: Peak market cap of $1B in 2015, largest network of rehab facilities nationwide. Filed for Chapter 11 in 2020, delisted and now trades OTC.

Thesis: As discussed in a 2016 VIC pitch, AAC generated $8,800 of revenue/patient per 30-day stay in drug revenue, according to 2015 financials. That translated to a testing frequency of 2-3 times per 30-day stay, which is ~10x more often than necessary. These urine tests also boasted obscenely high (90%+) margins, being reimbursed at $1,000+ thanks to AAC's use of unmerited "confirmatory" urine drug testing instead of simple and cheap dipstick tests. So even though urine tests constituted merely 20-25% of AAC's revenue, they contributed significantly to AAC's EBITDA. In fact, the rest of AAC's operation was actually losing money, and their urine drug testing operation was their cash cow. The catalyst for the short came in the form of reimbursement changes: multiple payors eventually announced changes to policies that would reduce drug testing reimbursements by up to 90%. Ultimately, AAC's leverage proved unsustainable in the face of declining urine testing profits and increased regulatory scrutiny, and the company would eventually file for bankruptcy.

Get in Touch

Feel free to reach out to us over Facebook or email if you have any questions

www.quantfsnyu.com

quantfsnyu@gmail.com

- President – Connor Liu (connor.liu@stern.nyu.edu)
- Vice-President – Arjan Kang (ask9108@stern.nyu.edu)
- Head of All Portfolios – Michael Lu (michael.j.lu@stern.nyu.edu)