Barbell Trading Strategy

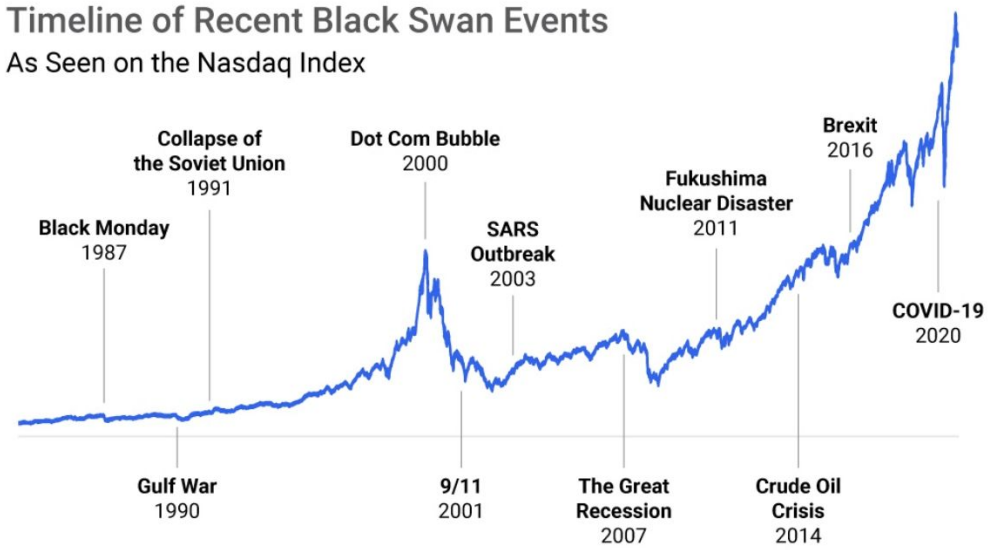
Capitalizing on mispriced black swan probabilities

Topics covered

- Introduction
- Analysis
- Implementation
- Conclusion

Introduction

“Black Swan” events



Can understand beforehand how and why, but very hard to estimate when

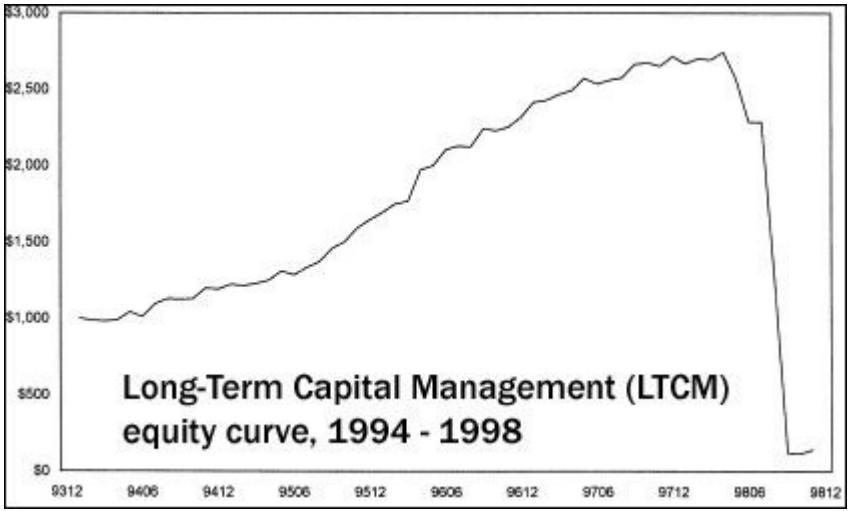
Black Swans are not rare

They’re actually what make up a large portion of stock market gains

Ruling out possibilities of large deviations

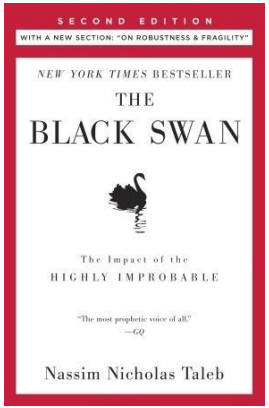
LTCM

The financial technology company



Barbell Strategy

Originated by Nassim Taleb, former Quant Trader



Objective: Capitalize on “positive” black swan movements that go along with our trade positions while minimizing effects of “negative” black swan events

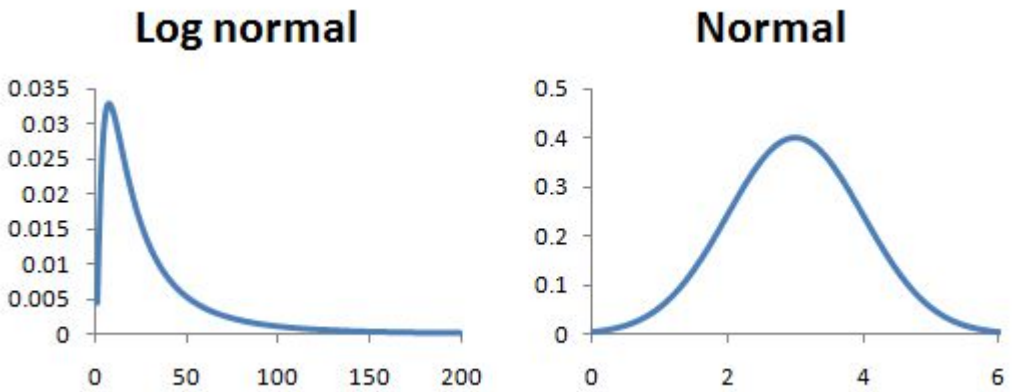
Barbell explained

Extremely safe, risk-free assets

Extremely risky positions

Large portion of portfolio in risk-free assets, small portion in perceived high-risk positions and no investment in “medium risk” assets (e.g index funds, etfs, “safe stocks”)

Profits on the premise that the Gaussian Distribution that is used by the Black-Scholes model to calculate fair option pricing is flawed in that it too heavily discounts the possibility of black swan events



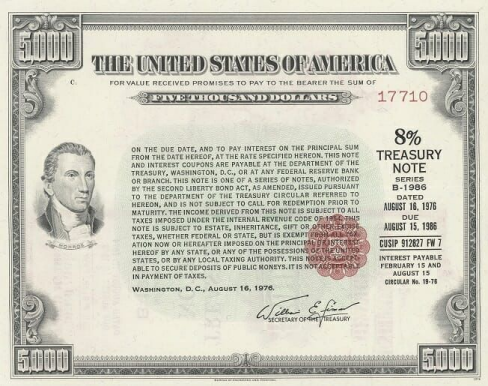
Analysis

Benefits of strategy

- Preservation of capital from market risk
- Potentially huge options payoffs
- Downside protection from negative black swan events, capitalizes on positive black swan events (moving in direction of long position)

90 / 10 Split

For our portfolio, we will allocate 90% of holdings to US Treasury Bonds and 10% to various out-the-money option positions



US Treasury Bonds

Safe to say that this is our risk-free asset (arguably nothing else more “risk free” in the world)

Options positions

Open various option positions that are long dated, out-of-the money that have low implied volatility

Why long-dated options?

Gives more time for black-swan event to occur. Theta decay is more favourable

Why out-of-the money?

- Options are cheaper since there needs to be significant price moves for option contract to gain intrinsic value
- Risking low contract premium for high payoff (assuming option becomes in-the-money)

Optimal Option

Long-dated (6+ months) out-of-the money option with implied volatility <5% of fair value of contract

General Idea

For the most part, our portfolio will incur tiny losses on expiring options contracts, but will benefit disproportionately at times when our options do payoff

Implementation

Foundational Coding languages

- Python / C++ for much of the logic used to implement the strategy (industry standard as they provide readability and efficiency)
- Javascript, HTML/CSS for frontend framework (dashboard for traders)

Aspect of implementation

- Price feed databases
- Frontend / backend framework
- Logical computation
- Bot execution

Price Feed databases

- Third-party API to request data
- Stored in relational database (SQL) where we can perform computations on / post data on dashboard

Frameworks

- Display data to traders about portfolio makeup, current positions, outgoing trades
- Functionality to allow manual buying / selling of assets (emergency brakes)
- Different model views & templates for different uses (e.g one template for portfolio overview, another on recent trades, etc)
- Get data from table as needed

Logical Computation

- Execute code to run computations (e.g Black-Scholes Model to find fair option value) based our data

Bot Execution

- Send requests to API connected to investing account to buy / sell assets
- Maintain portfolio construction (90 / 10 split), enter into favourable fair value positions, exit out of high implied volatility positions
- Get statistics on overall portfolio (e.g performance indicators)

Conclusion

The barbell strategy capitalizes on times when investor’s underestimate the possibility of black swan events, and ensure that our overall portfolio will be on the winning side of large market movements. This strategy can be easily implemented software-wise within an institution and can be scaled for use by multiple traders.