

# Performance Metrics

- Why do we need performance metrics?
  - This is how we know how much we will make
  - Helps us understand risk

# CAGR

- Compound Annual Growth Rate
- Definition: <https://www.investopedia.com/terms/c/cagr.asp>
- CAGR for S&P 500:  
[http://www.moneychimp.com/features/market\\_cagr.htm](http://www.moneychimp.com/features/market_cagr.htm)

# Volatility

- The standard definition of an asset
- Reading material:

<https://www.mathsisfun.com/data/standard-deviation.html>

# Sharpe Ratio

- Generally, the ratio between returns and standard deviation
- Subtract risk free rate because that's where the risk should come from (risk FREE)
- Reading material:  
<https://www.investopedia.com/terms/s/sharperatio.asp>

$$S = \frac{r_a - r_f}{\sigma_a}$$

Where,

$r_a$  is the average rate of return.

$r_f$  is the available rate of return of a risk free security.

$\sigma_a$  is the standard deviation of  $r_a$ .

# Max Loss (Drawdown)

- The worst case scenario for an asset
- From peak to trough; the biggest drop we've seen in history