Team 3 – PC3 Algo Trading

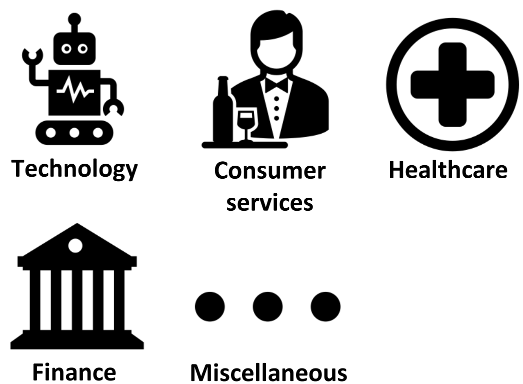
Philson Nah T0921464
Cheong Jia Wei Kenneth T0921456
Ching Yih Chin T0922339
Anwar Farihin Tan T0921459
Kenneth Zhuang T0921454

Our Stock Picks

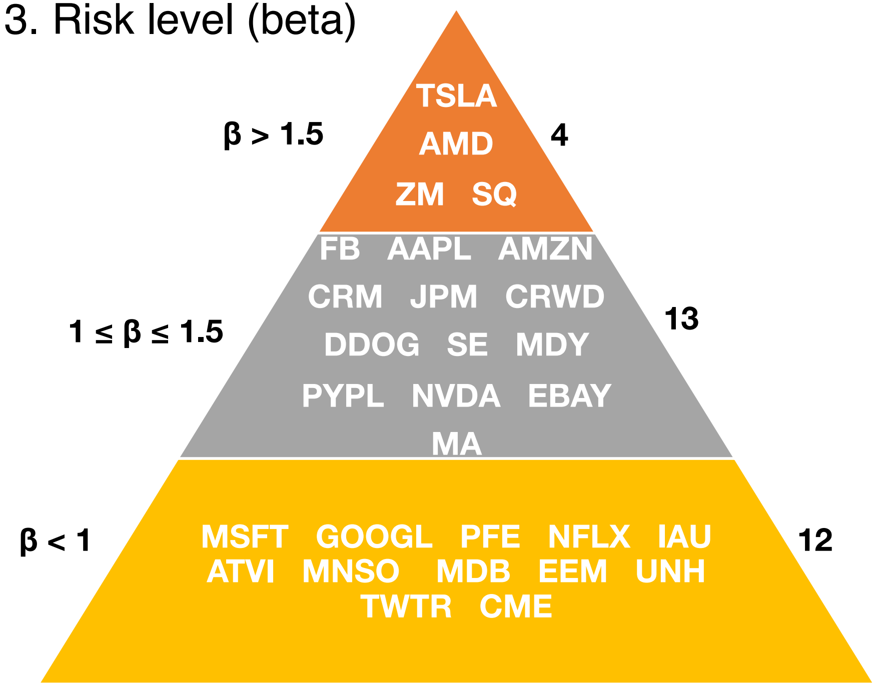
- ❑ Generally up-trending (long-term)
- ❑ Diversification

1. Asset class

2. Sectors



3. Risk level (beta)



29 US Securities

- ❑ Industries that are thriving during pandemic

Trading vs Investing

Can we really beat the stock market?

Trading Strategy

https://www.quantconnect.com/project/9485062

- Trend following strategy [long]

- Thesis:
  - ➢ If Daily RSI is bullish
  - ➢ If Price is above baseline EMA
  - ➢ If MACD has crossed bullish
  - ❖ Bullish continuation is likely

- Timeframe: 1H Candles

```
# STRATEGY PARAMETERS              (use this to optimize)
RSI_Period = 13                    # Daily RSI Look back period
self.RSI_Threshold = 50            # RSI bullish threshold level
MACD_Fast = 12                     # Hourly MACD fast EMA
MACD_Slow = 26                     # Hourly MACD slow EMA
MACD_Signal = 9                    # Hourly MACD signal length
EMA_Length = 34                    # Hourly trend baseline EMA
```

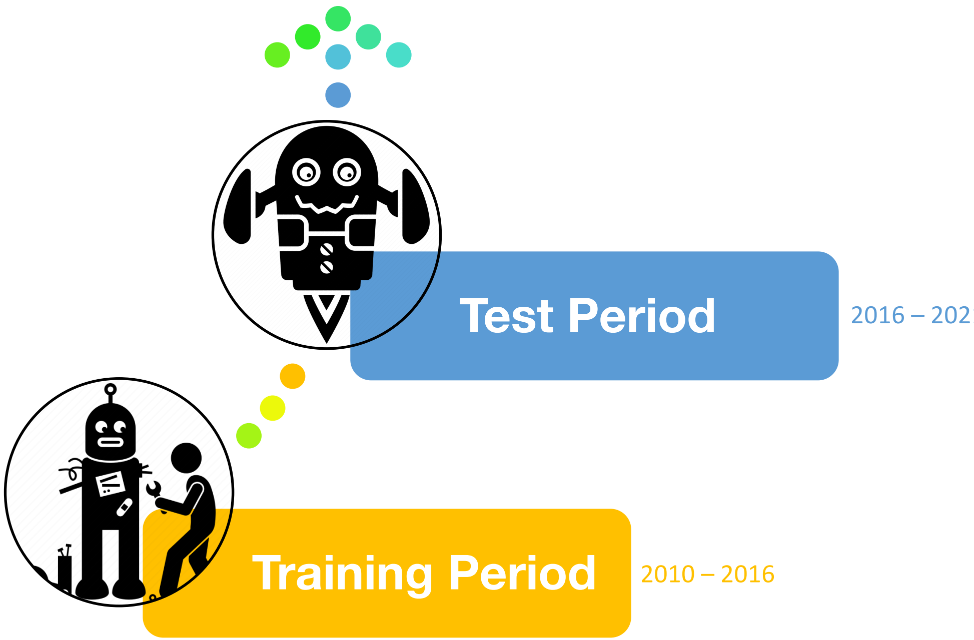
Risk Management

- How do we win more than lose?
- Using 2:1 R/R Ratio:
  - ➢ Every $1 risked, reward $2
  - ➢ Assume 50% success rate
  - ➢ i.e., 1 win 1 loss = $1 profit
  - ❖ we still come out ahead
- But how do we place a stoploss?
  - ➢ Use ATR to calculate dynamically

```
# TRADING PRAMETERS              (portfolio allocation, R/R ratio)
self.Allocation = 0.1            # Percentage of captital to allocate
ATR_Period = 13                  # Hourly ATR period for stoploss
self.SL_Multiple = 2             # Multiple of ATR for stoploss
self.TP_Multiple = 4             # Multiple of ATR for TP [1 : 2]
```

Testing Approach

- ✓ Avoid Bias
- ✓ Don't Overfit
- ✓ Many Data Points



Results

- Overall Returns: **279%**
  - ➢ Average win: +0.42%
  - ➢ Average loss: -0.28%
- Overall Sharpe Ratio: **1.508**
  - ➢ PSR: 78.347%
  - ➢ Beta: 0.547
- Overall Total Trades: **6700**
  - ➢ Test period: 5+ years
  - ➢ Assets traded: ~30

78.347%	$17,648.29	-$167,950.92	$2,941,924.22	279.17 %	$3,791,657.62	$768,737.40	$1,320,266,810.73	$130K
PSR	Unrealized	Fees	Net Profit	Return	Equity	Holdings	Volume	Capacity

Overall Statistics

PSR	0	Sharpe Ratio	1.508
Total Trades	6700	Average Win	0.42%
Average Loss	-0.28%	Compounding Annual Return	26.055%
Drawdown	33.400%	Expectancy	0.148
Net Profit	279.166%	PSR	78.347%
Loss Rate	55%	Win Rate	45%
Profit-Loss Ratio	1.53	Alpha	0.184
Beta	0.547	Annual Standard Deviation	0.188
Annual Variance	0.035	Information Ratio	0.568
Tracking Error	0.179	Treynor Ratio	0.518
Total Fees	$167950.92	Estimated Strategy Capacity	$130000.00

Challenges

- [ ] Not the best win rate
- [ ] Poor performance in 2019
- [ ] Hard to investigate further

Opportunities

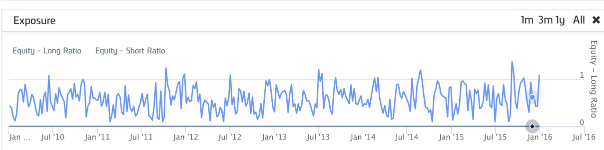
- [ ] Optimize the algorithm
- [ ] Optimize stock selections
- [ ] Long and Short strategies

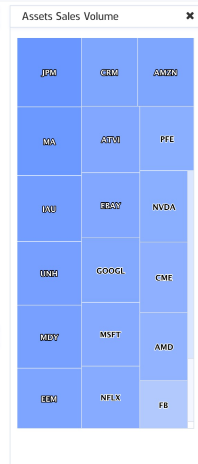
THANK YOU

Questions & Answers

Training Period Data

29.724%	$-10,337.08	-$161,015.25	$799,148.91	62.80 %	$1,627,989.27	$976,889.75	$614,591,428.23	$3.1M
PSR	Unrealized	Fees	Net Profit	Return	Equity	Holdings	Volume	Capacity





Overall Statistics

PSR	0	Sharpe Ratio	0.819
Total Trades	4746	Average Win	0.35%
Average Loss	-0.22%	Compounding Annual Return	8.457%
Drawdown	17.000%	Expectancy	0.098
Net Profit	62.799%	PSR	29.724%
Loss Rate	58%	Win Rate	42%
Profit-Loss Ratio	1.61	Alpha	0.029
Beta	0.433	Annual Standard Deviation	0.112
Annual Variance	0.012	Information Ratio	-0.411
Tracking Error	0.126	Treynor Ratio	0.211
Total Fees	$161015.25	Estimated Strategy Capacity	$3100000.00

2010/01/01 to 2016/01/01

Full Period Data

Overall Statistics

PSR	0	Sharpe Ratio	1.172
Total Trades	11456	Average Win	0.39%
Average Loss	-0.25%	Compounding Annual Return	16.625%
Drawdown	32.900%	Expectancy	0.129
Net Profit	510.067%	PSR	60.482%
Loss Rate	56%	Win Rate	44%
Profit-Loss Ratio	1.56	Alpha	0.1
Beta	0.498	Annual Standard Deviation	0.154
Annual Variance	0.024	Information Ratio	0.121
Tracking Error	0.154	Treynor Ratio	0.362
Total Fees	$431430.19	Estimated Strategy Capacity	$130000.00

2010/01/01 to 2021/10/04