Pairs Trading Strategy Using Data Science

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Stationarity

ADF Test

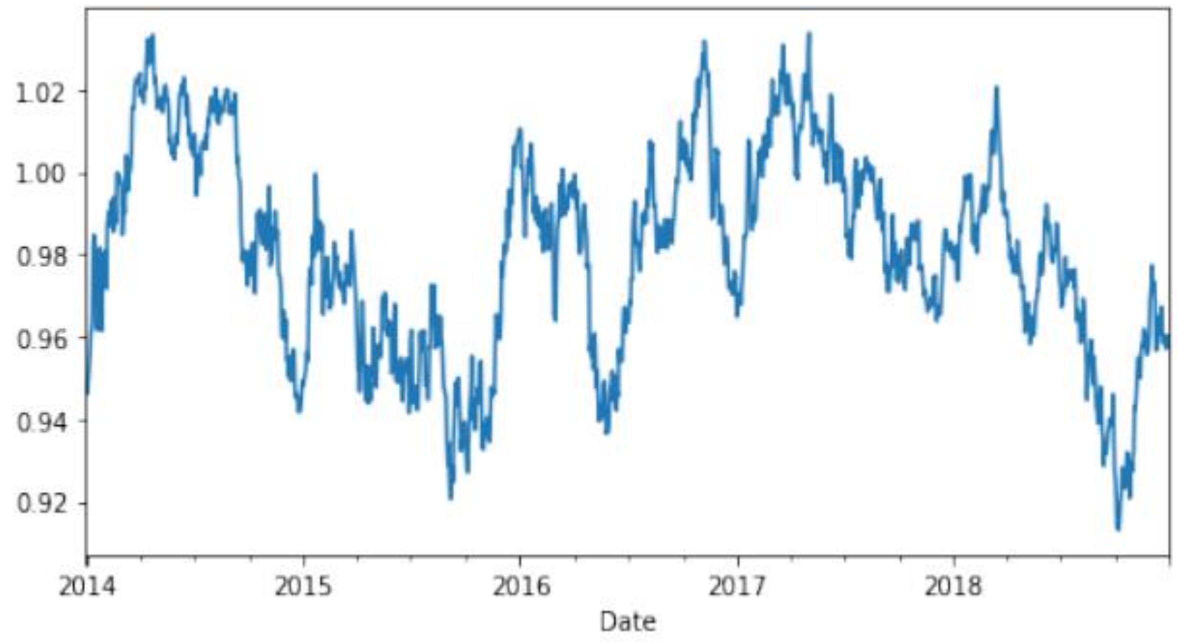
Mean Reversion Strategy

Example of TCS and INFY

Results discussion

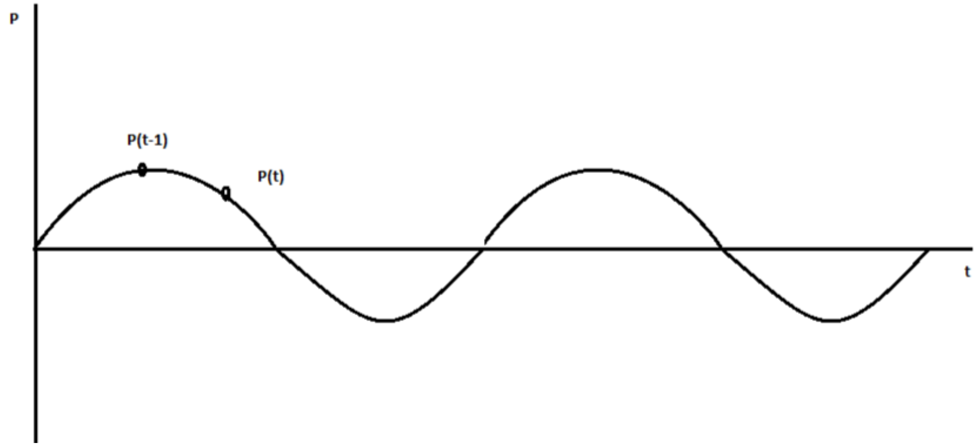
Future Plans

Stationarity price series which doesn't deviate much but stays around mean



ADF Test

EXAMPLE CHART



EXPLANATION

$$P(t) - P(t-1) = \varepsilon + \lambda * P(t-1)$$

If $\lambda = 0$, non-stationary

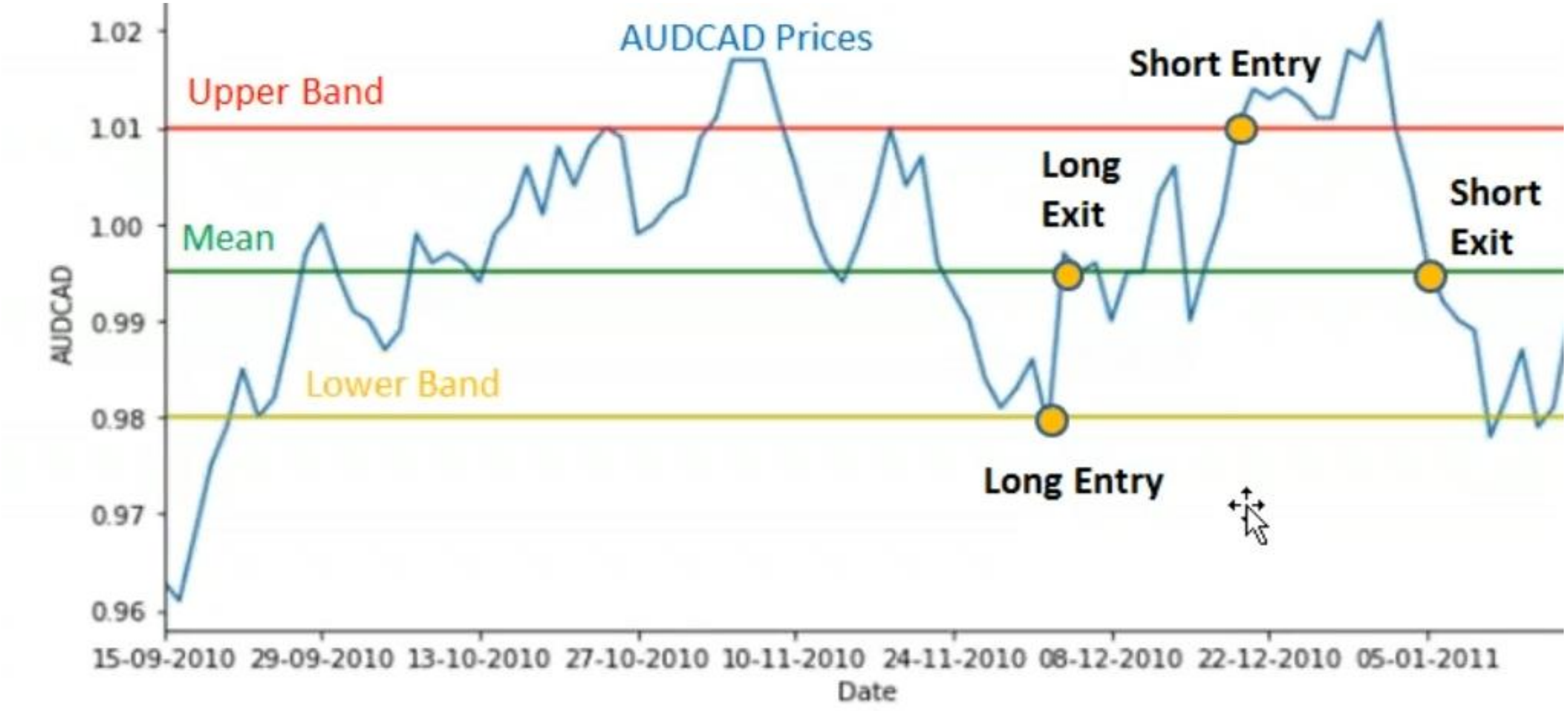
If $\lambda < 0$, null hypothesis is rejected with confidence interval

If $\lambda > 0$, price is not stationary

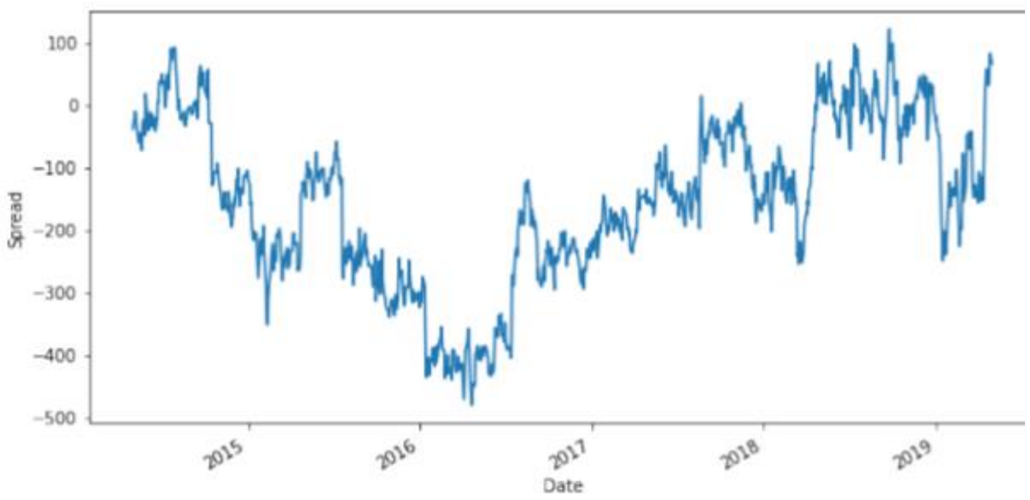
So current price is dependent on previous period price, and also price is stationary.

So we can use mean reverting strategy.

Mean Reversion Strategy



TCS AND INFY



Same sector and similar market cap, so similar type of price behaviour expected

Taking the spread and using linear regression to find the coefficient of slope

Doing ADF test and stationarity.

Doing Pairs trading on both ticker.

Results Discussion (Strategy V/S NIFTY 500)

Key Performance Metrics

Metric	Strategy	Benchmark
Risk-Free Rate	0.0%	0.0%
Time in Market	47.0%	100.0%
Cumulative Return	116.36%	59.35%
CAGR%	17.19%	10.05%
Sharpe	1.26	0.79
Prob. Sharpe Ratio	99.51%	95.96%
Smart Sharpe	1.2	0.75
Sortino	2.07	1.08
Smart Sortino	1.98	1.03
Sortino/√2	1.46	0.76
Smart Sortino/√2	1.4	0.73
Omega	1.36	1.36
Max Drawdown	-12.23%	-20.82%
Longest DD Days	342	520
Volatility (ann.)	13.63%	13.65%

Future Plans

Deployment on AWS

Using stop loss, target and doing optimization.