Predictive Analytics

Assignment 1

Submitted to

Prof. Vamsidhar Ambatipudi

[Department of Management]

Date: 27-11-2022

Submitted By:

Vishva Bhalodiya [2021H1540833P]

The Assignment is about the analysis of various trading strategies on the META security from January 2019 to October 2022.

The approach to Assignment:

* Loading dataset
* Implementing the trading strategies:

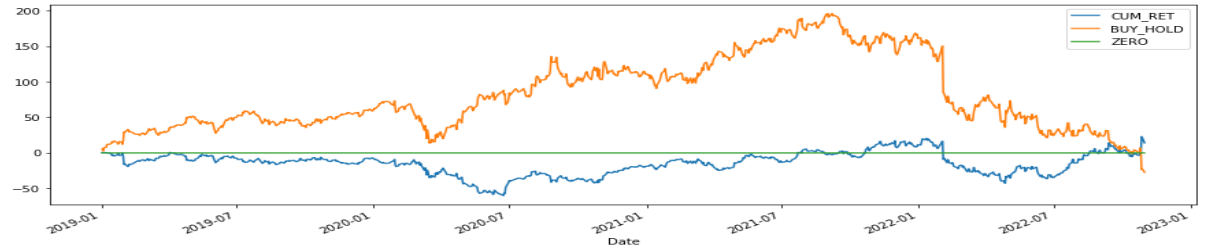
1. K-Band Strategy
2. Bollinger Band
3. Moving Average - EMA
4. Moving Average - SMA
5. MACD
6. RSI
7. WR
8. Stochastic Fast
9. Stochastic Slow
10. Ichimoku

* Testing of implemented strategies on the financial data.
* One Integrated function to find out the best strategy to trade with for a particular security.

Testing results on each trading strategy are as follows:

K-Band (n=5): Max Drawdown: -60.92 %

SIDE	NUM_TRADES	NUM_TRADES_WIN	AVG_DAYS	AVG_RET	AVG_RET_WIN	AVG_RET_LOSS	STD_RET
long	30	19	14.100000	0.621089	6.37944	-9.325153	9.423302
short	31	19	17.290323	1.761908	7.46697	-7.271108	9.513007

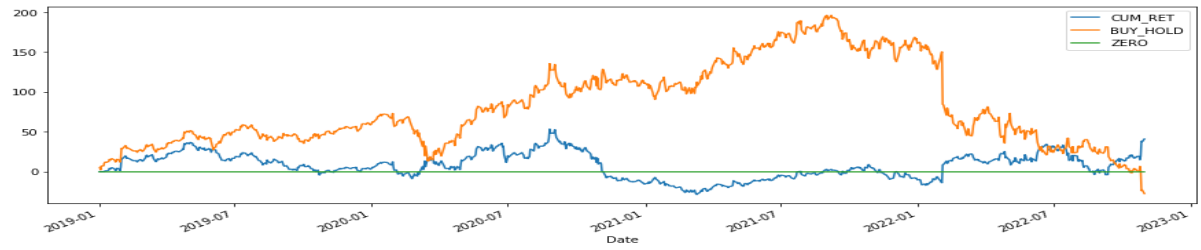


Bollinger-Band (n=20, n_rng= 2): Max Drawdown: -75.66 %

SIDE	NUM_TRADES	NUM_TRADES_WIN	AVG_DAYS	AVG_RET	AVG_RET_WIN	AVG_RET_LOSS	STD_RET
long	7	5	65.571429	1.041802	11.737598	-25.697687	24.628703
short	8	5	56.750000	-0.070772	6.349678	-10.771520	12.119134

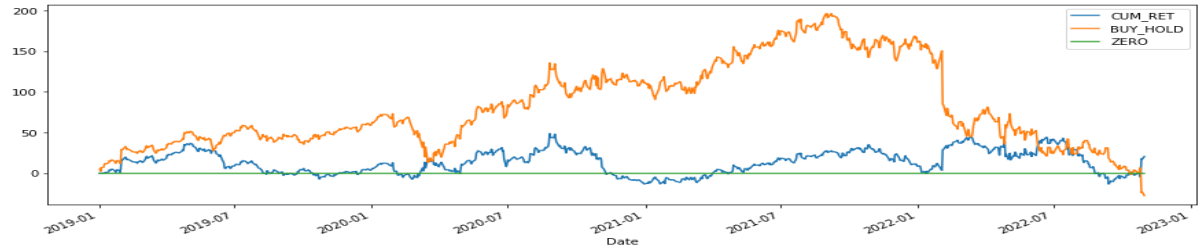
Moving average – EMA (n=50, ma_type = 'ema'): Max Drawdown: -53.65 %

SIDE	NUM_TRADES	NUM_TRADES_WIN	AVG_DAYS	AVG_RET	AVG_RET_WIN	AVG_RET_LOSS	STD_RET
long	38	11	14.710526	0.693741	8.924647	-2.659591	8.133283
Short	37	9	9.513514	0.361953	9.781741	-2.665836	9.222539



Moving average – SMA (n=50, ma_type = 'sma'): Max Drawdown: -41.89 %

SIDE	NUM_TRADES	NUM_TRADES_WIN	AVG_DAYS	AVG_RET	AVG_RET_WIN	AVG_RET_LOSS	STD_RET
long	36	8	15.111111	0.454714	12.665085	-3.033963	8.666719
short	35	12	10.942857	0.245150	6.882406	-3.217766	8.739973



MACD (n_slow=26, n_fast=12, n_sign=9): Max Drawdown: -75.58 %

SIDE	NUM_TRADES	NUM_TRADES_WIN	AVG_DAYS	AVG_RET	AVG_RET_WIN	AVG_RET_LOSS	STD_RET
long	37	14	13.810811	-0.411171	8.638029	-5.919379	10.721571
short	36	12	12.500000	0.321099	10.633230	-4.834967	9.406081

RSI (n = 14): Max Drawdown: -76.32 %

SIDE	NUM_TRADES	NUM_TRADES_WIN	AVG_DAYS	AVG_RET	AVG_RET_WIN	AVG_RET_LOSS	STD_RET
long	3	3	49.333333	23.716452	23.716452	NaN	8.07481
short	4	2	129.500000	-1.985027	6.277247	-10.247302	11.05184

WR (n=14): Max Drawdown: -58.45 %

SIDE	NUM_TRADES	NUM_TRADES_WIN	AVG_DAYS	AVG_RET	AVG_RET_WIN	AVG_RET_LOSS	STD_RET
long	28	20	13.571429	1.829838	6.683837	-10.305157	10.419419
short	29	18	18.862069	1.348702	6.653892	-7.332518	8.846587

Stochastic Fast (k = 20, d = 5): Max Drawdown: -83.26 %

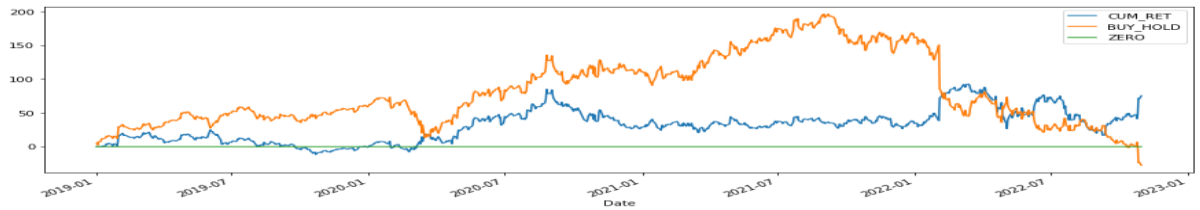
SIDE	NUM_TRADES	NUM_TRADES_WIN	AVG_DAYS	AVG_RET	AVG_RET_WIN	AVG_RET_LOSS	STD_RET
long	153	58	3.254902	-0.405233	3.203342	-2.608363	4.548298
short	153	58	3.039216	-0.269510	3.212058	-2.395099	3.615311

Stochastic Slow(k = 20, d = 5, dd = 3): Max Drawdown: -82.21 %

SIDE	NUM_TRADES	NUM_TRADES_WIN	AVG_DAYS	AVG_RET	AVG_RET_WIN	AVG_RET_LOSS	STD_RET
long	96	34	4.989583	-0.756323	4.022901	-3.377188	5.593845
short	96	31	4.906250	-0.395134	4.778499	-2.862559	4.828122

Ichimoku (n_conv = 9, n_base = 26, n_span_b = 52): Max Drawdown: -39.39 %

SIDE	NUM_TRADES	NUM_TRADES_WIN	AVG_DAYS	AVG_RET	AVG_RET_WIN	AVG_RET_LOSS	STD_RET
long	21	8	27.619048	1.904087	12.955423	-4.896734	12.936872
short	20	6	16.800000	1.383463	14.707268	-4.326739	13.156544



Interpretation of the above strategies:

After implementing the above strategies, I found that the Ichimoku strategy is outperforming all. Although the Ichimoku is performing well, there's a huge opportunity to explore the strategies with a different parameter that may perform better than the current scenario. To get a better combination of parameters for an improvement in the result, Let's explore these strategies with some ranges of parameters for each strategy.

Note: Graphs for the strategy showing negative returns has been removed.

Best strategy among all the strategies with different combinations of parameters:

Best Strategy: Strategy_WR

Parameters: n=8

SIDE	NUM_TRADES	NUM_TRADES_WIN	AVG_DAYS	AVG_RET	AVG_RET_WIN	AVG_RET_LOSS	STD_RET
long	44	32	10.227273	2.010233	5.392968	-7.010394	7.124968
short	45	30	11.400000	2.806554	6.907712	-5.395762	9.583764

Conclusion:

The best-suited strategy among all the strategies with various combinations of parameters is "strategy_WR" with parameter n=8. Following this strategy would lead to higher returns as compared to others.