BACKTESTNG REPORT

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Client Information

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Independent Trader

Strategy (system) Requirement

Purpose: Evaluate Trading system on NIFTY INDEX and BANKNIFTY based on the trading rules provided.

Duration: Past 7 years

Total Number of indicators used: 2 Indicators [EMA and and ADX],

Strategy Name: [redacted]

Trading Rules:

Entry:

Trading rule and stratey name is confidential for client

Exit:

Total Number of Condition:

1. 6 Conditions for Entry and 2 Condition for Exit.

TRADING STRATEGY REPORT

Executive Summary:

This strategy is positional trading strategy. Tested on Daily Time frame candle. Based on the above mentioned rules.

Strategy overview:

Strategy Name: 10EMA-ADX-Position.

Strategy Type: Long only strategy.

Asset type: Index

Description:

The strategy underwent back testing using historical data spanning a 20-year period. It encompasses all stocks within the NIFTY50 index as the sample universe. The analysis is conducted on a daily timeframe using candlestick charts.

Objective:

1. The objective of this report is to provide performance metrics so that developer of this strategy can take a sound decision whether he/she should deploy in front test or even in live market.
2. Another objective of this report is to provide the developer of this strategy with a key parameter to access the profitability, consistency of this strategy.

Key Performance metrics used

Total Return (in %):

$$\left[\left\{\frac{(Final\ value\ of capital)}{Initial\ capital}\right\} - 1\right] * 100$$

Total Return (in amount):

$$Final\ value\ of\ capital - Initial\ Capital$$

Sharpe Ratio:

$$Sharpe\ ratio = \frac{Rs - Rf}{\sigma s}$$

Here,
Rs = Return of strategy
Rf = Risk free rate
σs = Standard deviation of return (risk)

Average Profit:

$$Average\ Profit = \frac{Total\ Profit - Total\ Loss}{Total\ number\ of\ trade}$$

Average Bars Held:

$$Average\ Bars\ Held = \frac{Sum\ of\ Bars\ Held\ for\ All\ Trade}{Total\ number\ of\ trade}$$

Max. System Drawdown(MXDD):

From equity Curve

MXDD%:

$$MXDD\% = \frac{Max.System\ Drawdow}{Peak\ Equity} \times 100$$

Gross Recovery Factor:

$$Gross\ Recovery\ Factor = \frac{Net\ Profit}{Max.\ System\ Drawdown}$$

CAR/MXDD%:

$$\frac{CAR}{MXDD} = \frac{Compounded\ annual\ \%\ return}{MS\%D}$$

RAR/ MXDD

$$= \frac{\text{Sharpe Ratio} - \text{Rf}}{\text{MXDD}}$$

Profit Factor (PF):

$$PF = \frac{Total\ \ Profit}{Total\ Loss}$$

Payoff Ration (PR):

$$PR = \frac{Avg.Profit\ per\ \ Winning\ Trade}{Ang.Loss\ per\ Losing\ Trade}$$

Standard Error (Std.E):

$$Std.E = \frac{Standard\ Deviation\ of\ \ equity\ curve}{\sqrt{Number\ of\ \ trade}}$$

Annualized Return:

$$\sqrt[n]{\frac{Ending\ Value}{Initial\ Capital}}$$

Methodology

Samples:

The data sample contain top 50 stock based on free-float market capitalization. It also comprise of stocks across various industry such as FMCG, Telecom, Banking, IT etc.

Data Collection:

Data is collected from yahoo-finance public database.

Data Period:

Starting: 1/11/2016

Ending: 22/12/2023.

Tools:

1. **Line Charts**
2. **Table**
3. **Bar Chart**

Depth Analysis

Summery:

Stats for Equity Curve from 2017-01-23 00:00:00 - 2023-12-22 00:00:00
Annual risk-free rate considered: 7.17%
Summary:

Total Return	Sharpe	CAGR	Max Drawdown
46.45%	4.19	5.68%	-4.69%

Annualized Returns:

mtd	3m	6m	ytd	1y	3y	5y	10y	incep.
10.98%	10.91%	19.38%	23.15%	23.15%	9.31%	5.85%	-	5.68%

Periodic:

	daily	monthly	yearly
sharpe	4.19	0.03	-0.23
mean	147.07%	7.25%	4.99%
vol	33.47%	8.76%	9.32%
skew	2.83	2.73	2.03
kurt	9.93	8.80	4.10
best	10.98%	10.98%	23.15%
worst	-1.50%	-1.27%	-0.72%

Drawdowns:

max	avg	# days
-4.69%	-1.58%	303

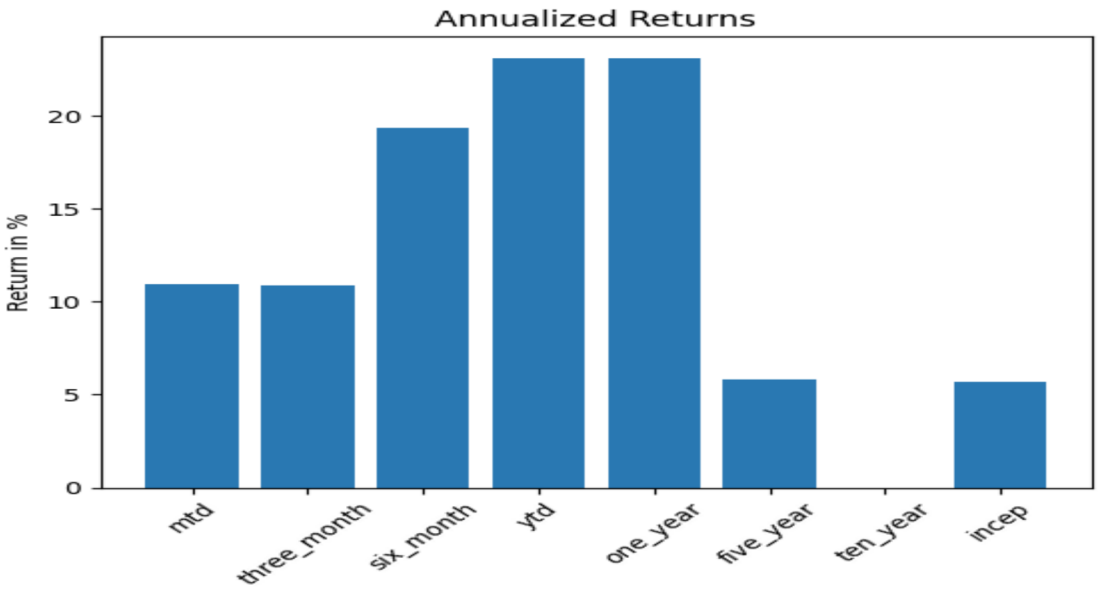
Misc:

avg. up month	3.29%
avg. down month	-0.62%
up year %	66.67%
12m up %	30.14%

Annualized Returns (%):

mtd	three_month	six_month	ytd	one_year	five_year	ten_year	incep
10.98	10.91	19.38	23.15	23.15	5.85		5.68

Annualized Returns Graph:



Periodic metric:

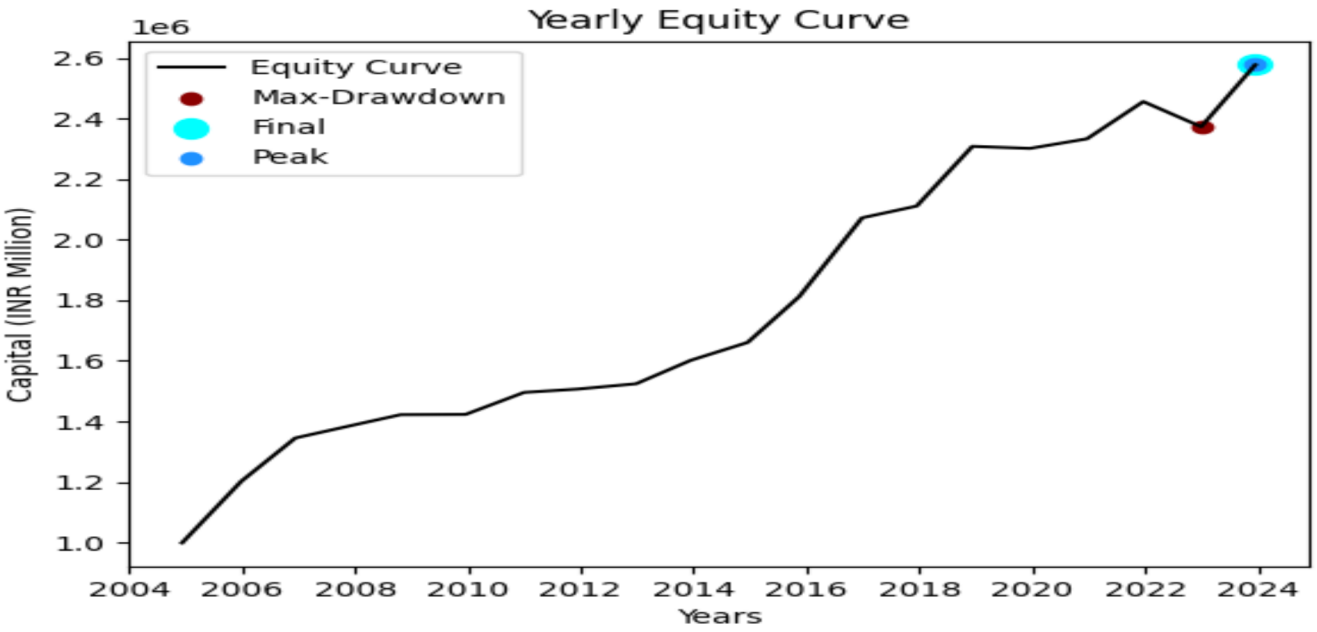
	sharpe	mean	vol	skew	kurt	best	worst
Daily	4.19	147%	33%	2.83	9.93	10.98	-1.50%
Monthly	0.03	7%	9%	2.73	8.8	10.98	-1.27%
Yearly	-0.23	5%	9%	2.03	4.1	23.15	0.72%

Please note as this strategy is of positional trading variable based daily periodicity is not a good metric to analyses.

Start Period	9/08/2004
End Period	12/12/2023
Total Profit/Loss	Rs.15,78,108.34
Avg. Profit/Loss	1397.8
Total Return	157.81%
Annualized Return	5.03% cagr.
Sharpe Ratio	-41.17
Avg. Bars Held	60
Gross Recovery Factor	35.95
Yearly Max Drawdown (%)	3.39%
CAR/MaxDD	1.15
RAR/MaxDD	-9.38
Profit Factor	2.96
Payoff Ratio	3.89
Standard Error	29683
Standard Deviation	441447.3
System Max Drawdown	4.39%

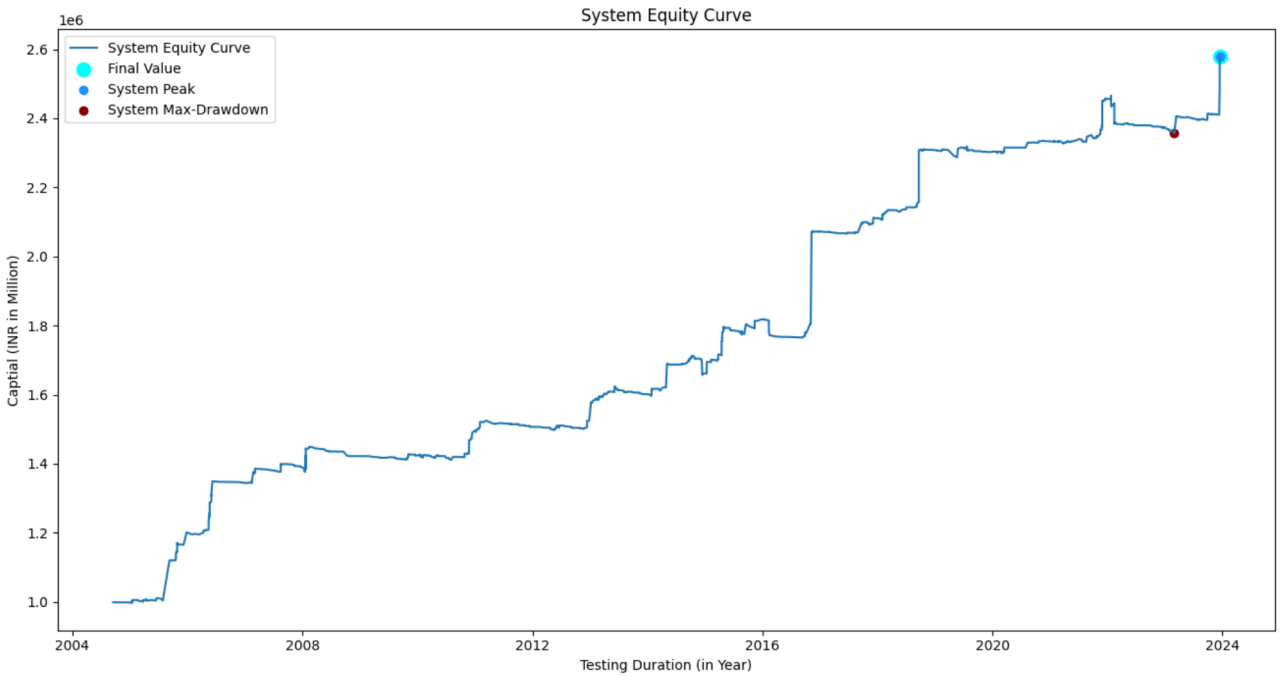
Key Performance Matrix Table

Yearly Equity Curve



Yearly equity curves is steadily upward with compounded annual growth rate of 5.03%. Final value and peak is equal near the end of 2024. The volatility seems to be low and Year Max Drawdown is 3.39%.

System Equity Curve

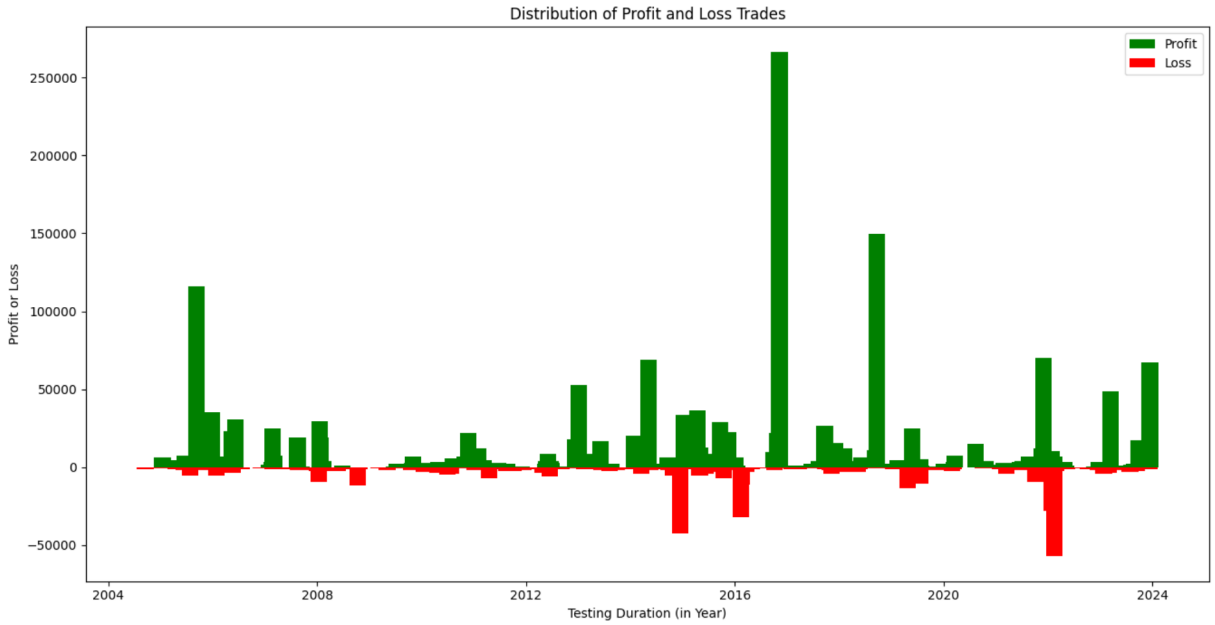


System Equity Curve is upward sloping, given that I notice some flat portion appear indication that trading strategy have not contributed much to the equity curve. This can be due to following reason:

1. Market has not given any opportunity, or
2. The stock chosen in the sample might not performed well.

If we see in the dept we noticed that period between 2008 to 2012 (Global financial crisis) and period between 2019 to early 2023(Covid Pandemic). This was the two major period when there were no such move in the equity curve, which is kind of advantage and disadvantage both. Advantage because, investor capital was protect due to the nature of the strategy and disadvantage because, the investor capital has not generated much return.

Distribution of Profit and Loss Trades



Based on the above graph it seems like the strategy is might have the winning accuracy greater then 50%. But, numerically it is not the case. Out of total trades 1129, 454 trades were profitable. If we compare average loss and average profit, the loss made by this strategy is less then the profit made.

Tester's Opinion

Equity Curve and max drawdown of strategy indicates, that the strategy is *relatively very stable.* However, the Sharpe Ratio is negative, suggesting a high level of risk. The Profit Factor of 2.96 and Payoff Ratio of 3.89 indicate favorable reward-to-risk ratios. Other point to be noted is that this strategy generate on an average 5.03% of compounded annual growth rate, which is way low them some of the risk free investment option available.

Conclusion:

Strategy optimization is highly required for the strategy to earn return excess to risk free rate and average return generated by Nifty50.

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