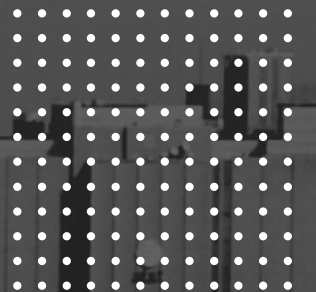


Market Neutral Momentum Trading Strategy for NIFTY 50

CREATED BY TEAM: M.A.D

*In the chaos of the market, neutrality
is the calm.*



INDEX

1. Understanding the PS

3. Trading Strategy

5. Position Sizing

8. Performance Metrics

2. Momentum scoring criteria

4. Risk Management Measures

7. Portfolio PnL

9. Spearman and References

UNDERSTANDING THE PROBLEM STATEMENT

ASSESSMENTS-

- ROI (RETURN ON INVESTMENT)
- VOLATILITY AND MAXIMUM
DRAWDOWN
- SHARPE RATIO AND SORTINO
RATIO

"Our task is to design and implement a Market Neutral Momentum Trading Strategy using NIFTY 50 stocks. The strategy aims to generate returns by balancing long positions on outperforming stocks and short positions on underperforming stocks, minimizing exposure to the overall market and reducing systemic risk."

The goal is to backtest the strategy over multiple time periods to assess its profitability and risk metrics."

MOMENTUM SCORING CRITERIA

- "Momentum scoring is based on two key indicators: Rate of Change (ROC) and On-Balance Volume (OBV)."
- "ROC measures price momentum over 200 days, while OBV gauges buying or selling pressure through volume flow."
- "Both indicators are standardized using the z-score method, and the final momentum score is the average of these standardized values."
- "Stocks with high positive momentum scores are selected for long positions, while those with negative scores are shorted."

TRADING STRATEGY AND SIGNAL GENERATION METHOD

Daily Stock Ranking:

"We generate a daily ranking of stocks based on their momentum scores, updated to reflect changing market conditions. This enables us to capture both positive and negative momentum in real-time."

Long Position Criteria:

"For stocks that cross above the predefined long threshold on a given day, we initiate long positions. The threshold signals strong positive momentum, indicating potential for further price appreciation."

Squaring Off Long Positions:

"If a stock's momentum score drops below the threshold, we square off the long position. This helps lock in profits or limit losses by exiting positions with weakening momentum."

Short Position Criteria:

"For stocks that cross below the predefined short threshold on a given day, we initiate short positions. This indicates strong negative momentum, suggesting further price decline."

Squaring Off Short Positions:

"If a stock's score rises above the threshold, we square off the short position to avoid losses or preserve gains from earlier downward momentum."

Flexible Thresholds:

"Both long and short thresholds are adjustable, allowing us to fine-tune the strategy to optimize performance under different market conditions. This flexibility ensures the strategy adapts to evolving market dynamics."

RISK MANAGEMENT MEASURES

Stop-Loss Mechanism:

"We implement a strict stop-loss mechanism to limit potential losses. Positions are automatically closed if prices move against us beyond a predefined percentage, helping protect the portfolio from major drawdowns."

Position Sizing:

"Capital is distributed equally across all long and short positions to minimize concentration risk. This ensures no single position has an outsized impact on the portfolio's overall performance."

Market Neutrality:

"By maintaining a balanced number of long and short positions, the strategy reduces exposure to broad market movements, ensuring that profits are driven by stock-specific momentum rather than overall market direction."

Threshold Adjustments:

"Momentum thresholds for entering and exiting positions can be dynamically adjusted to reflect changing market volatility, ensuring that we remain agile and responsive to different risk environments."

Regular Monitoring:

"The strategy includes frequent monitoring of portfolio performance and momentum shifts, allowing us to exit trades that are losing momentum or showing increased risk."

TRADING SIGNALS GENERATED

Signal Generation:

"Trading signals are generated daily based on momentum scores. Stocks crossing above the long threshold trigger buy signals, while those crossing below the short threshold trigger sell signals."

"Signals are based on real-time momentum shifts, ensuring timely entry and exit from positions to capitalize on short-term trends."

Long Signals:

"A buy signal is generated when a stock's momentum score exceeds the long threshold. This indicates strong positive momentum, and a long position is initiated."

Short Signals:

"A sell signal is generated when a stock's momentum score drops below the short threshold. This suggests significant negative momentum, leading to the initiation of a short position."

POSITION SIZING

Position Sizing:

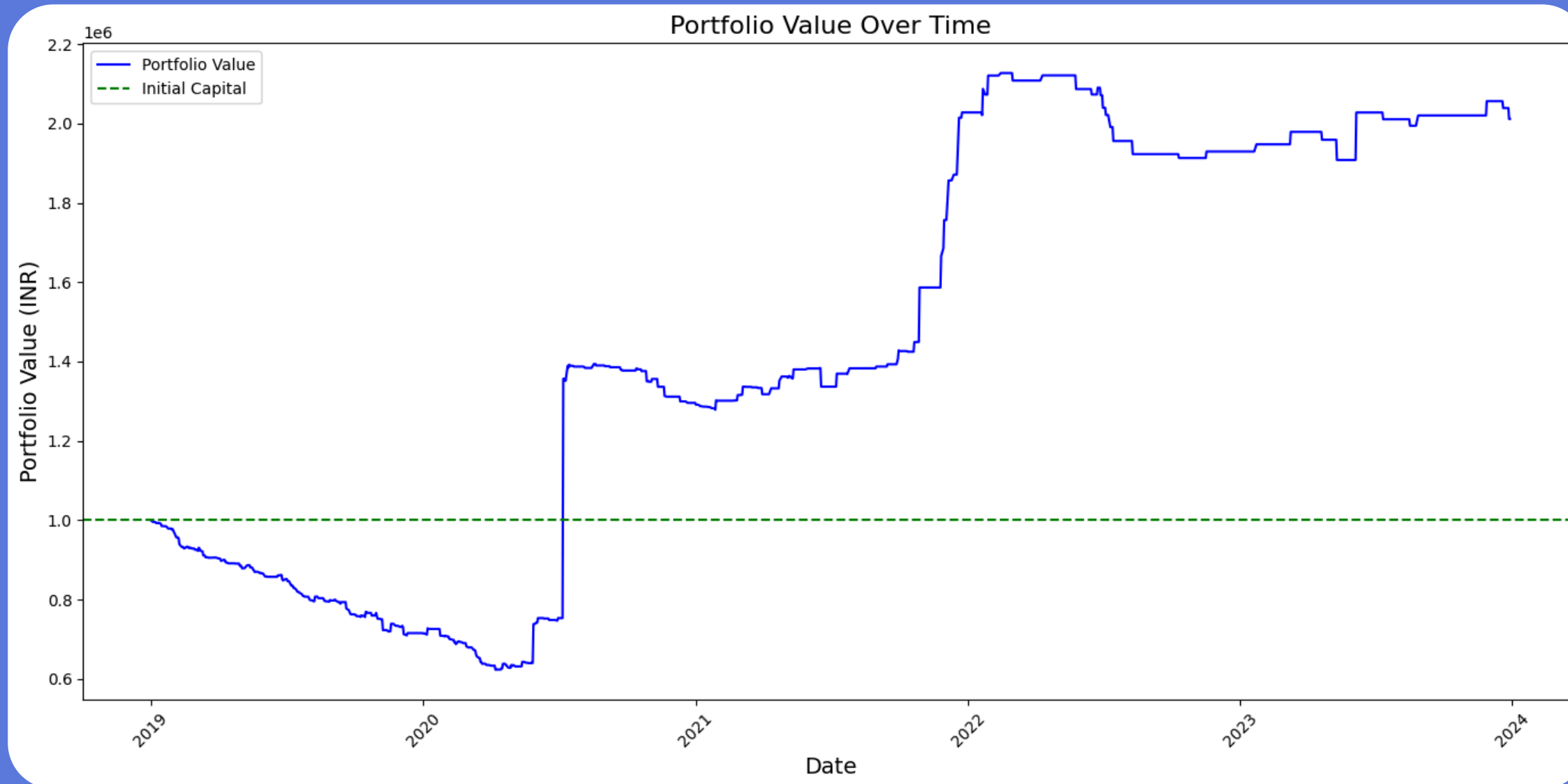
"Capital is allocated equally across all active long and short positions. This helps distribute risk evenly and prevents overexposure to any single stock."

"Position sizes are adjusted dynamically based on the number of qualifying stocks on a given day, ensuring efficient capital usage while maintaining market neutrality."

Adjustments to Position Sizes:

"If fewer stocks meet the criteria for long or short positions, the available capital is split among them, ensuring no underutilization of funds. Conversely, if more stocks qualify, position sizes adjust accordingly to maintain balance."

PORTFOLIO PNL



PORTFOLIO VALUE OVER TIME

Initial value of portfolio: 1000000
Final value of portfolio: 2011076.11
Profit: 1011076.11

ROI= 101.11%

Initially, the portfolio value steadily decreases from 2019 through 2020, falling below the initial capital benchmark (marked by the green dashed line).

Overall, the strategy seems to have yielded positive returns, particularly after the sharp upward trend post-2020

SPECIAL CASE AND ADDITIONAL DISCUSSION

The frequency of trades in our strategy is quite high due to daily re-ranking. However, to mitigate this, we can shift to re-ranking on a bi-monthly or quarterly basis.

Additionally, our strategy incorporates a large number of parameters, ensuring it is both well-diversified and balanced. By training appropriate machine learning models like Neural Networks, Random Forest, Bayesian Approach_ etc we can fine-tune these parameters to optimize the weighting, further enhancing the overall performance of the strategy.

On the day Romesh Sobti's term as IndusInd Bank's Managing Director and Chief Executive Officer ended after 12 years of service, the bank's shares tanked 30 percent.

It wasn't only due to the panic triggered by the coronavirus outbreak. The bank's stock has been falling for a while. Just to give a perspective, in the last one year, the share price fell by over 86 percent—from Rs 1,684 apiece to Rs 235.60 (52-week low). The shares have recovered to some extent since then and are now trading at Rs 301 apiece.



[click here](#)

PERFORMANCE METRICS

CAGR

15.01%

smoothed annual growth rate by assuming that the investment has grown at a steady rate, even if the actual returns may have fluctuated year-to-year

ANNUALISED VOLATILITY

0.3709

measure of the amount of risk or uncertainty associated with the price movements of a financial asset, such as stocks, over a year.

SHARPE RATIO

0.1480

shows how much excess return you can expect to earn for the extra volatility (or risk) that you take on by holding a risky asset rather than a risk-free asset

SORTINO RATIO

0.1424

variation of the Sharpe Ratio that focuses specifically on downside risk, rather than overall volatility

MAX DRAWDOWN

-37.65%

measure of the largest observed loss from the peak to the trough of a portfolio's value during a specific period before it begins to recover.

SPEARMAN RANK

To enhance the strategy, we intended to use Spearman rank correlation coefficients to measure the relationship between momentum scores and returns, followed by ranking the stocks accordingly. However, time constraints prevented the implementation of this approach.

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