

Market Neutral Momentum Trading Strategy

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Beyond the Hype: Quantifying Momentum's Potential with Backtesting

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The Problem Statement in detail

What is Market Neutral Momentum Trading?

Market Neutral Momentum Trading is a trading strategy that aims to profit from the momentum of securities while maintaining a neutral exposure to the overall market.

How is it achieved?

This strategy profits from relative price movements by taking balanced long and short positions to minimize market exposure and reduce systemic risk.

What's the Task at Hand?

Design and implement a Market Neutral Momentum Trading strategy using companies listed in the NIFTY 50 index and backtest the strategy over various time periods to assess profitability and risk associated with long and short positions based on momentum signals.

Key steps to engineer the strategy

- Calculating Momentum score
- Generating Momentum signals
- Backtesting
- Assessing returns and drawdowns
- Performance Evaluation

Momentum Scoring Criteria

Our Momentum Score includes the following indicators with objectives and goals for each:

- **RSI:** Provides insights into market sentiment and potential price reversals by capturing overbought and oversold conditions.
- **Bollinger Bands:** Measure volatility and help identify potential price breakouts.
- **Volatility Data:** Provides a direct measure of price fluctuations.
- **SMA and EVMA:** Help to identify trends and potential support and resistance levels.

These indicators are then normalized using appropriate methods and Momentum Score is obtained by the **product** of these values.

Why product? : Using the product of indicators can amplify extreme values, detect divergences, and implicitly weight indicators.

Stocks displaying high momentum scores are selected for **long** positions, while stocks with low momentum scores are chosen for **short** positions.



Momentum Score Formula

Momentum Score = Normalized Bollinger band score combined with RSI * Volatility Score *
Normalized EVMA

The reason why this strategy of combining the above technical indicators outperformed is because of it is much more dynamic in executing the trades.

1. Based on the results from the research paper we have combined values from Bollinger bands with RSI value of the stock to get BB RSI Score.
2. Along with this to include the risk factor we have calculated risk factor.
3. We added exponential volume moving average to take care of market sentiments

We have backed our formula the following research paper :

<http://surl.li/slrjku>

two conditions are not fulfilled, then that signifies a trade exit or a sell signal. The third strategy uses Bollinger bands and relative strength index indicators. In this case, when the closing price of the stock is higher than the simple moving average component of the Bollinger Band and it is supported by a relative strength index which is greater than 50, a trade entry signal is generated. When the share price touches the lower Bollinger band or if the relative strength index is below the appropriate level, a trade exit signal is generated.

Trading Strategy and Signal Generation Method

1. Portfolio Initialization

- Initial capital is given as ₹1 million, equally allocated to long and short positions. Initial long and short stocks are identified based on highest and lowest momentum scores.

2. Entry and Exit Rules

- The strategy initiates long and short positions at the start, and rebalances the portfolio daily. Positions are exited if the current stock ranking falls outside the top 5 for longs and bottom 5 for shorts.

3. Position Sizing and Rebalancing

- Half of the portfolio is allocated to each position (long and short), and the allocation is adjusted proportionally whenever a position is exited or a new position is entered.

4. Trading Signal Generation

- The strategy uses momentum score rankings to generate signals for entering and exiting positions. The top 5 stocks with the highest momentum scores are considered for long positions, and the bottom 5 with the lowest scores are considered for short positions.

5. Portfolio Value Tracking

- The portfolio value is updated at each trade execution based on the exit value of the closed position and the initial investment. Final portfolio value, long and short positions are displayed at the end.

Risk Management Methods

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

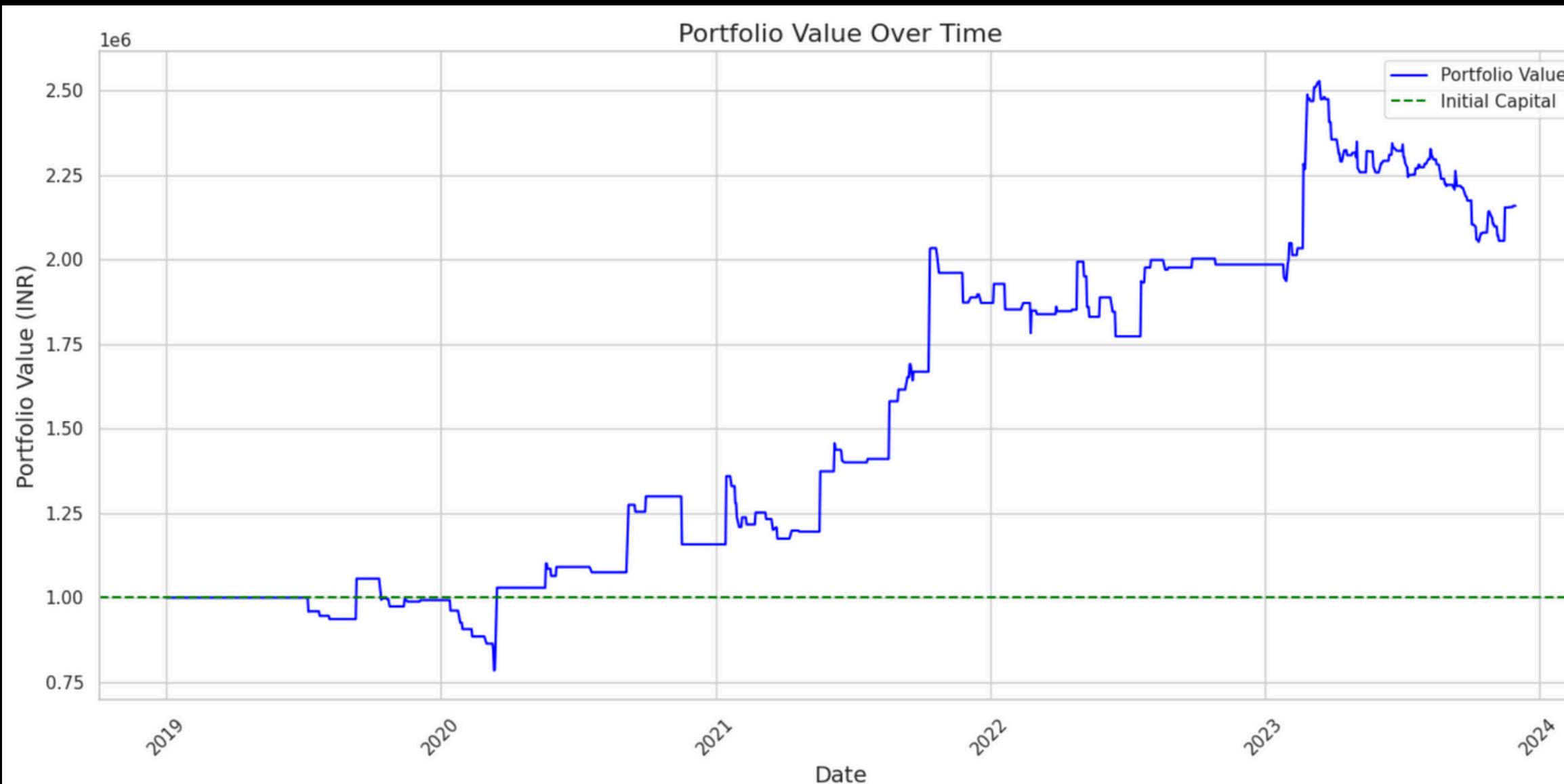
Ensured by taking balanced number of long and short positions

REGULAR MONITORING

We regularly monitor portfolio performance and momentum shifts

PORTFOLIO PnL

- **Initial Portfolio Value:** ₹10,00,000
- **Final Portfolio Value :** ₹21,58,492.98
- **Period:** 5 Years
- **Total P and L:** Final portfolio Value - Initial Portfolio value = 11,58,492.98
- **Total Return :** $11,58,492.98 / 10,00,000 * 100 = 115.84\%$



Till initial years of 2020 we see that the portfolio value fluctuates around 10 lakhs. After that we see an increase along with little fluctuation in the portfolio value till the initial years of 2023. After that we see a gradual decrease till the end of 2024. However this decrease is not very significant. Finally at the end of 5 years we have good profit of 11,58,492.98.

Performance Metric Analysis

1. Profit

- 1141424.52

2. ROI

- 114.14%

3. Annualized Volatility

- 0.2628

4. Sharpe Ratio

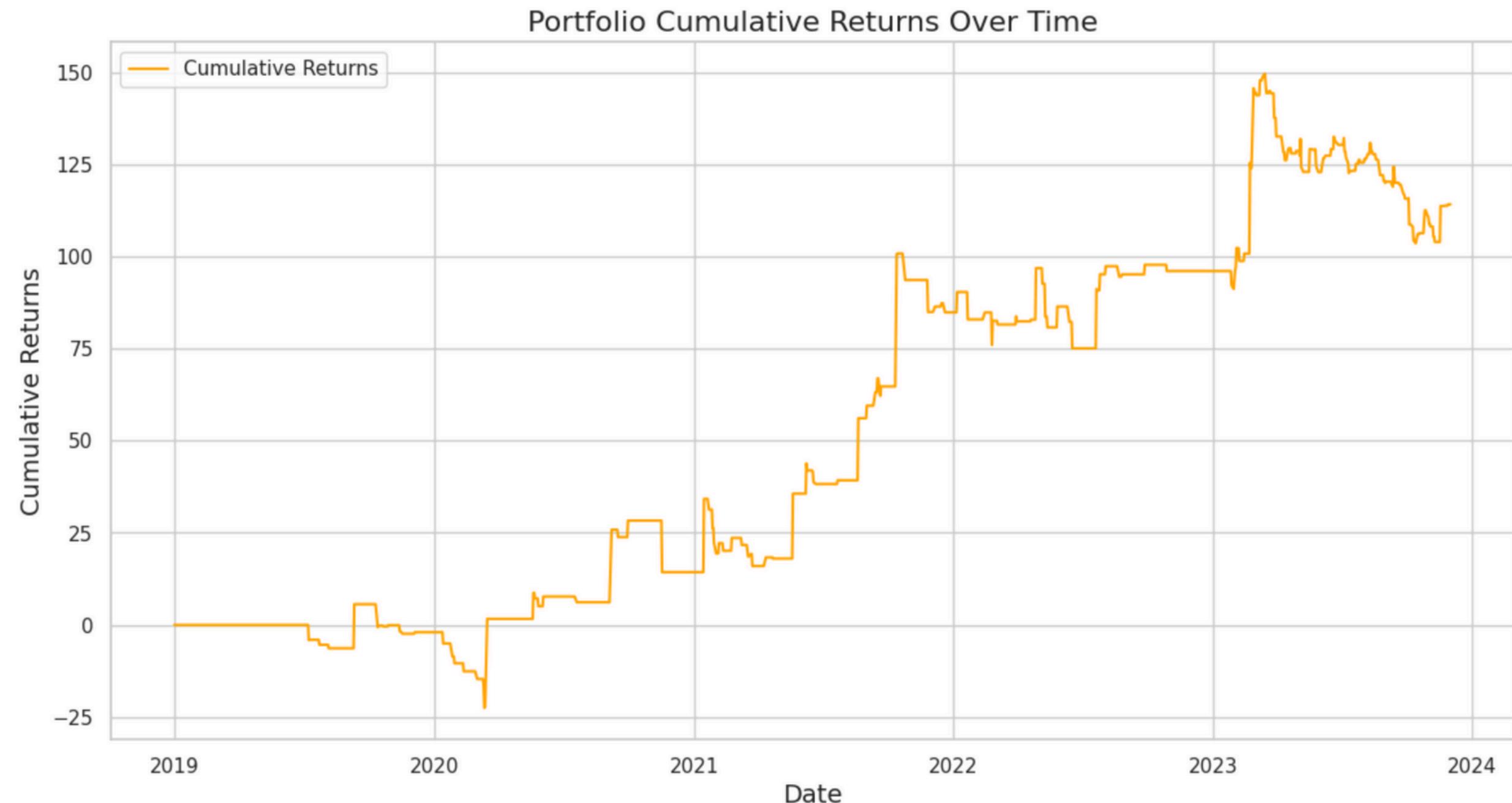
0.2036

5. Sortino Ratio

0.0652

6. Maximum Drawdown

0.0652



The background of the image is a dark, grainy aerial photograph of a city at night, showing a dense cluster of skyscrapers and buildings.

Thank you!
