

InterIIIT TechMeet BootCamp '24-25

Market Neutral Momentum Trading Strategy

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INTRODUCTION

A **market-neutral momentum trading strategy** is an advanced approach in trading that aims to exploit short-term price movements while minimizing exposure to broader market risks. This strategy typically involves going both **long** and **short** on different assets, allowing a trader to capture price momentum (both upward and downward) while aiming for **neutrality** in terms of market direction.

1. Market Neutrality

The core principle of **market neutrality** is to make the portfolio as independent as possible from the overall market movements. A market-neutral strategy attempts to generate returns based on the relative performance of the assets selected, rather than from the direction of the entire market (like whether the market is bullish or bearish). This is achieved by balancing long and short positions so that the total exposure to broad market movements (beta) is close to zero.

- **Long Positions:** Buying securities expected to **increase** in price.
- **Short Positions:** Selling borrowed securities expected to **decrease** in price.

2. Momentum Trading

Momentum trading is based on the idea that **securities that have performed well recently will continue to perform well** in the near future, while those that have performed poorly will continue to underperform. The strategy involves identifying securities with **positive momentum** (upward price trends) to go long and securities with **negative momentum** (downward price trends) to go short.

MOMENTUM SCORING

OBJECTIVE:

To use a combination of technical indicators to rank NIFTY 50 stocks by their momentum profiles. Quantify bullish and bearish momentum to identify potential outperformers or underperformers. The goal is to capture price movement, volatility, and market sentiment with a composite momentum score for each stock.

Technical Indicators used for scoring:

1. Rate Of Change (ROC)
2. Relative Strength Index (RSI)
3. Avg Directional Index (ADX)
4. Avg True Range (ATR)
5. Moving Avg Convergence Divergence (MACD)

INDICATORS AND WEIGHTING STRATEGY

1. RSI (Weight: 20%):

- RSI is a momentum oscillator that ranges from 0 to 100, with values above 70 indicating overbought conditions and below 30 indicating oversold.

- **Scoring:**

- RSI > 70: -1 (Bearish, overbought)
- RSI < 30: +1 (Bullish, oversold)
- 30 < RSI < 70: 0 (Neutral)

2. MACD (Weight: 30%):

- MACD is a trend-following momentum indicator. It subtracts the 26-period EMA from the 12-period EMA. A signal line (9-period EMA of MACD) helps identify buy/sell signals.

- **Scoring:**

- MACD > Signal Line: +2 (Bullish crossover)
- MACD < Signal Line: -2 (Bearish crossover)

3. ROC (Rate of Change) (Weight: 10%):

- ROC is a pure momentum indicator that measures the percentage change in price over a certain period. Positive ROC shows bullish momentum; negative ROC shows bearish.

- **Scoring:**

- ROC > 0: +1 (Bullish)
- ROC < 0: -1 (Bearish)

4. ADX (Weight: 20%):

- ADX is a non-directional indicator that measures the strength of a trend. ADX values above 25 indicate a strong trend.

- **Scoring:**

- ADX > 30: +2 ADX > 25 : +1 (Strong Trend)
- ADX < 25: 0 (Weak/No Trend)

5. ATR (Weight: 20%):

- ATR measures volatility. Higher ATR values suggest increased volatility, which can signal potential reversals or breakouts.

- **Scoring:**

- ATR increasing: +1 (Bullish volatility expansion)
- ATR decreasing: -1 (Bearish volatility contraction)

Composite Scoring Formula

The final momentum score for each stock will be calculated using the following weighted sum:

Composite Score=0.2×RSI Score+0.3×MACD Score+0.1
×ROC Score+0.2×ADX Score+0.2×ATR Score+0.1×RO
C Score+0.2×ADX Score+0.2×ATR Score

Final Ranking of Stocks:

Stock	Momentum Score
ICICIBANK.NS	9.4
RELIANCE.NS	8.5
SBIN.NS	8.1
KOTAKBANK.NS	7.9
BHARTIARTL.NS	7.7
INFY.NS	7.2
TCS.NS	6.3
LT.NS	6.0
HDFCBANK.NS	5.1
HINDUNILVR.NS	4.8

Strategy Development

HYPOTHESIS 1

1. Based on ROC: ROC > 0
(Bullish Momentum)
ROC < 0 (Bearish
Momentum)
2. Volume : High volume
indicates better
momentum
3. ADX: To measure strength
of momentum
4. ATR: To set stoploss and
manage risk

HYPOTHESIS 2

1. Support and Resistance
Breakout
2. Volume should be high
3. ADX to confirm strength
4. Candlestick to indicate
reversal
5. Parabolic SAR or ATR for
trailing stoploss

HYPOTHESIS 3

1. Based only on ROC
2. Long if ROC > 0
3. Short if ROC < 0
4. Used to show basic
momentum indicator
results

STRATEGY 1



- **Entering LONG position**

1. ROC > 5
2. Fast Volume SMA > Slow Volume SMA
3. Fastest EMA > Fast EMA > Slow EMA
4. +DI > 30

- Exiting LONG position

1. ROC < 2.5
2. Fast Vol < Slow Volume
3. +DI < 20

- Exiting SHORT position

1. ROC > -0.5
2. Fast Vol < Slow Volume
3. +DI < 20

- **Entering SHORT position**

1. ROC < -2
2. Fast Volume SMA > Slow Volume SMA
3. Fastest EMA < Fast EMA < Slow EMA
4. -DI > 25

STOP LOSS

Based on HIGHEST HIGH
and LOWEST LOW

STRATEGY 2



```
levels = []
for i in range(2,df.shape[0]-2):
    if isSupport(df,i):
        levels.append((i,df['Low'][i]))
    elif isResistance(df,i):
        levels.append((i,df['High'][i]))
```

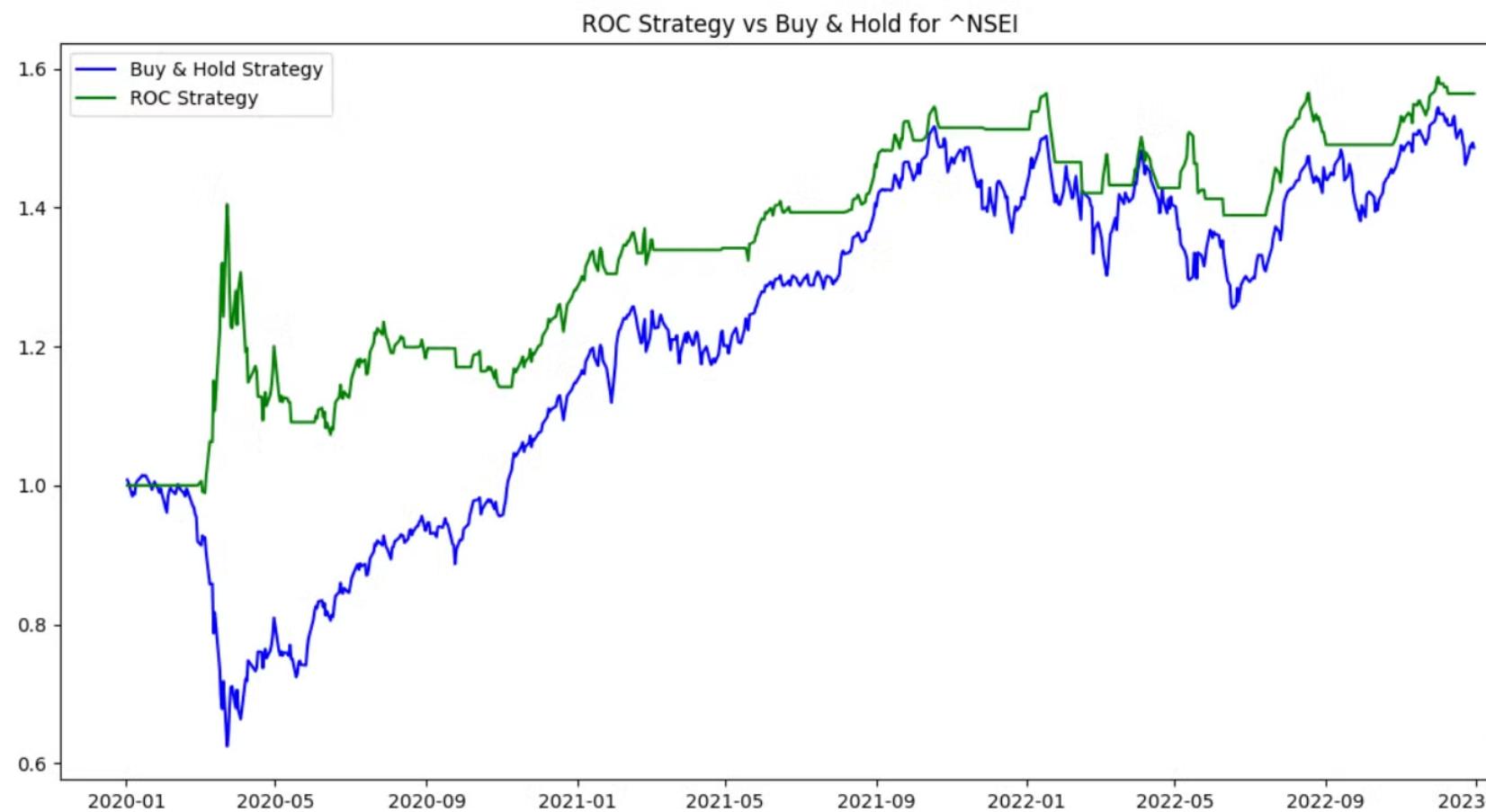
- **Entering LONG position**

1. If CMP is above its nearest resistance (>1%)
 2. Volume > 1.5 times Avg 30 day Vol
 3. ADX +DI> 25
- Exiting Long position
1. Reversal Candlestick observed such as evening star, bearish engulfing pattern
 2. Volume < Avg 30 days Vol
 3. + DI < 20

- **Entering SHORT position**

1. If CMP is below its nearest support (<1%)
 2. Volume > 1.5 times Avg 30 day Vol
 3. ADX +DI> 25
- Exiting Short position
1. Reversal Candlestick observed such as morning star, bullish engulfing pattern
 2. Volume < Avg 30 days Vol
 3. + DI < 20

STRATEGY 3



Number of trades: 366

Net return of ROC strategy: 56.39%

BACKTESTING RESULTS

Key Performance Metrics:

Return: 11.13%

Buy & Hold Return: -5.06%

Max Drawdown: -21.44%

Sharpe Ratio: 0.09

Sortino Ratio: 0.14

Calmar Ratio: 0.10

Total Trades: 28

Win Rate: 57.14%

Best Trade: 16.20%

Worst Trade: -8.93%

Avg. Trade: 0.38%

Max. Trade Duration: 35 days 00:00:00

Avg. Trade Duration: 19 days 00:00:00

Profit Factor: 1.28

Expectancy [%]: 0.52

```
# Print key metrics
print("\nKey Performance Metrics:")
print(f"Return: {stats['Return [%]']:.2f}%")
print(f"Buy & Hold Return: {stats['Buy & Hold Return [%]']:.2f}%")
print(f"Max Drawdown: {stats['Max. Drawdown [%]']:.2f}%")
print(f"Sharpe Ratio: {stats['Sharpe Ratio']:.2f}")
print(f"Sortino Ratio: {stats['Sortino Ratio']:.2f}")
print(f"Calmar Ratio: {stats['Calmar Ratio']:.2f}")
print(f"Total Trades: {stats['# Trades']}")
print(f"Win Rate: {stats['Win Rate [%]']:.2f}%")
print(f"Best Trade: {stats['Best Trade [%]']:.2f}%")
print(f"Worst Trade: {stats['Worst Trade [%]']:.2f}%")
print(f"Avg. Trade: {stats['Avg. Trade [%]']:.2f}%")
print(f"Max. Trade Duration: {stats['Max. Trade Duration']}")
print(f"Avg. Trade Duration: {stats['Avg. Trade Duration']}")
print(f"Profit Factor: {stats['Profit Factor']:.2f}")
print(f"Expectancy [%]: {stats['Expectancy [%]']:.2f}%)
```

THANK YOU

TEAM NAME : BOLLINGER BULLS

1. SARVAGYA TIWARI
2. DIVYAM KULSHRESTHA





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