Cryptocurrency Trading Strategy Backtest Analysis Report

Algorithmic Trading Division

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Contents

1 Strategy Overview and Logic

This section presents a comprehensive analysis of our multi-timeframe trading strategy designed for cryptocurrency markets. The strategy implements a sophisticated combination of technical indicators and risk management techniques.

1.1 Core Strategy Components

The strategy utilizes multiple technical indicators for signal generation:

- Bollinger Bands for mean reversion and volatility analysis
- MACD and Signal Line crossovers for trend confirmation
- Stochastic Oscillator for overbought/oversold conditions
- Average Directional Index (ADX) for trend strength measurement
- On-Balance Volume (OBV) for volume trend analysis
- Relative Strength Index (RSI) for momentum measurement

1.2 Entry Conditions

Long entries require:

- Price touching lower Bollinger Band
- MACD above Signal Line
- Stochastic K below 35
- RSI below 40
- Positive MACD and OBV slopes
- Volume spike confirmation

Short entries require:

- Price touching upper Bollinger Band
- MACD below Signal Line
- Stochastic K above 65
- RSI above 60
- Negative MACD and OBV slopes
- Volume spike confirmation

1.3 Risk Management

The strategy implements dynamic position sizing and risk management:

- ATR-based trailing stops
- Dynamic ATR multiplier based on volatility percentile
- Position size adjustment based on volatility conditions
- Minimum bars between trades to avoid overtrading
- Transaction cost consideration (0.1% per trade)

2 1-Minute Timeframe Analysis

2.1 Performance Metrics

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Performance Metrics:
Total Return: 4347938983.78% (Market: 323.32%)
Max Drawdown: -3.05%
Sharpe Ratio: 7.42
Win Rate: 27.50%
Number of Trades: 240
Calmar Ratio: 1426403953.55
Total Fees Paid: $492426302.27
Total Fees as % of Initial Capital: 49242630.23%
```

Figure 1: Performance Metrics - 1-Minute Timeframe(final portfolio includes fees reduction)

2.2 Performance Graphs

Figure 2: Equity Curve and Drawdown - 1-Minute Timeframe

2.3 Last 10 trades executed

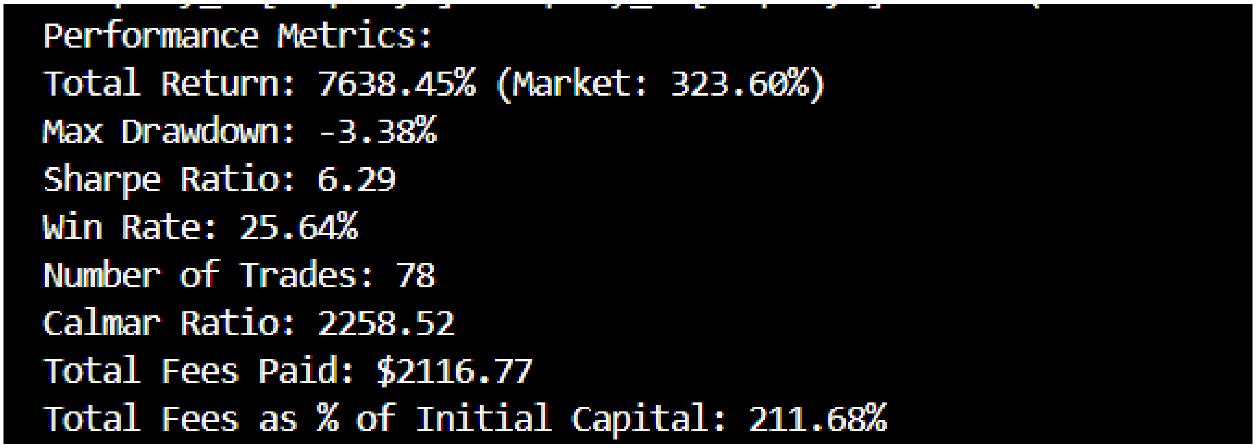
Last 10 Trades:

Type	DateTime	Price	Portfolio	Fee
LONG	2023-10-30 17:07	34430.0	1.947234e+10	1.949183e+07
EXIT_LONG	2023-10-30 17:09	34385.1	1.942750e+10	1.944694e+07
SHORT	2023-12-03 05:43	39431.1	1.940807e+10	1.942750e+07
EXIT_SHORT	2023-12-03 05:57	39404.8	2.910239e+10	2.913152e+07
SHORT	2023-12-04 01:45	40804.0	2.907329e+10	2.910239e+07
EXIT_SHORT	2023-12-04 01:59	40613.7	2.917967e+10	2.920888e+07
SHORT	2023-12-04 18:51	41757.8	2.915049e+10	2.917967e+07
EXIT_SHORT	2023-12-04 19:03	41840.5	2.906367e+10	2.909276e+07
LONG	2023-12-25 02:27	42966.2	2.903460e+10	2.906367e+07
EXIT_LONG	2023-12-25 02:29	42937.6	4.347939e+10	4.352291e+07

Figure 3: Last couple of trades executed- for 1-Minute Timeframe

3 3-Minute Timeframe Analysis

3.1 Performance Metrics



```
Performance Metrics:
Total Return: 7638.45% (Market: 323.60%)
Max Drawdown: -3.38%
Sharpe Ratio: 6.29
Win Rate: 25.64%
Number of Trades: 78
Calmar Ratio: 2258.52
Total Fees Paid: $2116.77
Total Fees as % of Initial Capital: 211.68%
```

Figure 4: Performance Metrics - 3-Minute Timeframe

3.2 Performance Graphs

Figure 5: Equity Curve and Drawdown - 3-Minute Timeframe(final portfolio includes fees reduction)

3.3 Last 10 trades executed

Last 10 Trades:

Type	DateTime	Price	Portfolio	Fee
LONG	2023-07-24 11:36	29244.3	78954.96	79.0340
EXIT_LONG	2023-07-24 12:21	29163.0	78656.73	78.7355
LONG	2023-08-07 00:18	29067.4	78578.07	78.6567
EXIT_LONG	2023-08-07 00:30	29041.2	78428.74	78.5072
SHORT	2023-10-20 21:18	29619.3	78350.31	78.4287
EXIT_SHORT	2023-10-20 22:57	29649.3	78192.68	78.2710
SHORT	2023-12-16 03:27	42208.8	78114.49	78.1927
EXIT_SHORT	2023-12-16 03:45	42351.9	77771.81	77.8497
SHORT	2023-12-19 00:06	42746.4	77694.04	77.7718
EXIT_SHORT	2023-12-19 01:39	42874.1	77384.47	77.4619

Figure 6: Last couple of trades executed- for 3-Minute Timeframe

4 15-Minute Timeframe Analysis

4.1 Performance Metrics

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Performance Metrics:
Total Return: 404.92% (Market: 325.33%)
Max Drawdown: -4.70%
Sharpe Ratio: 6.39
Win Rate: 32.14%
Number of Trades: 28
Calmar Ratio: 86.19
Total Fees Paid: $60.62
Total Fees as % of Initial Capital: 6.06%
```

Figure 7: Performance Metrics - 15-Minute Timeframe((final portfolio includes fees reduction)

4.2 Performance Graphs

Figure 8: Equity Curve and Drawdown - 15-Minute Timeframe

4.3 Last 10 trades executed

Last 10 Trades:

Type	DateTime	Price	Portfolio	Fee
LONG	2022-11-09 02:30	18181.8	2187.95	2.1901
EXIT_LONG	2022-11-09 06:30	18392.6	2211.10	2.2133
LONG	2023-05-21 20:30	26843.0	2208.89	2.2111
EXIT_LONG	2023-05-21 21:00	26756.0	2199.53	2.2017
LONG	2023-06-15 06:30	24953.9	2197.33	2.1995
EXIT_LONG	2023-06-15 14:00	25067.7	2205.14	2.2073
LONG	2023-09-05 08:30	25657.1	2202.94	2.2051
EXIT_LONG	2023-09-05 23:15	25773.2	3316.04	3.3194
SHORT	2023-09-12 16:15	26294.3	3312.72	3.3160
EXIT_SHORT	2023-09-12 23:00	25843.4	5049.24	5.0543

Figure 9: Last couple of trades executed- for 15-Minute Timeframe

5 Timeframe Comparison and Conclusions

Based on the backtest results, this strategy demonstrates optimal performance in shorter timeframes, particularly in the 1-minute timeframe. This superior performance in shorter intervals can be attributed to:

- More frequent mean reversion opportunities
- Faster reaction to volume spikes and price movements
- Higher number of trading opportunities
- Better capture of short-term price inefficiencies

The strategy's effectiveness diminishes in longer timeframes due to:

- Reduced number of trading opportunities
- Lower sensitivity to short-term price movements
- Delayed reaction to market changes
- Higher impact of market noise on longer timeframes