

Cryptocurrency Trading Strategy Backtest Analysis Report

Algorithmic Trading Division

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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

2.2 Net Return value

$$\begin{aligned} & (43479389.8378 \times 1000) - 492426302.27 \\ & \qquad \qquad \qquad = \\ & \qquad \qquad \qquad \mathbf{42,98,69,63,535.53} \end{aligned}$$

Figure 2: Net Return = (Overall return for initial 1000 dollar investment) - (Total fees paid)
- for 1-Minute Timeframe

2.3 Performance Graphs

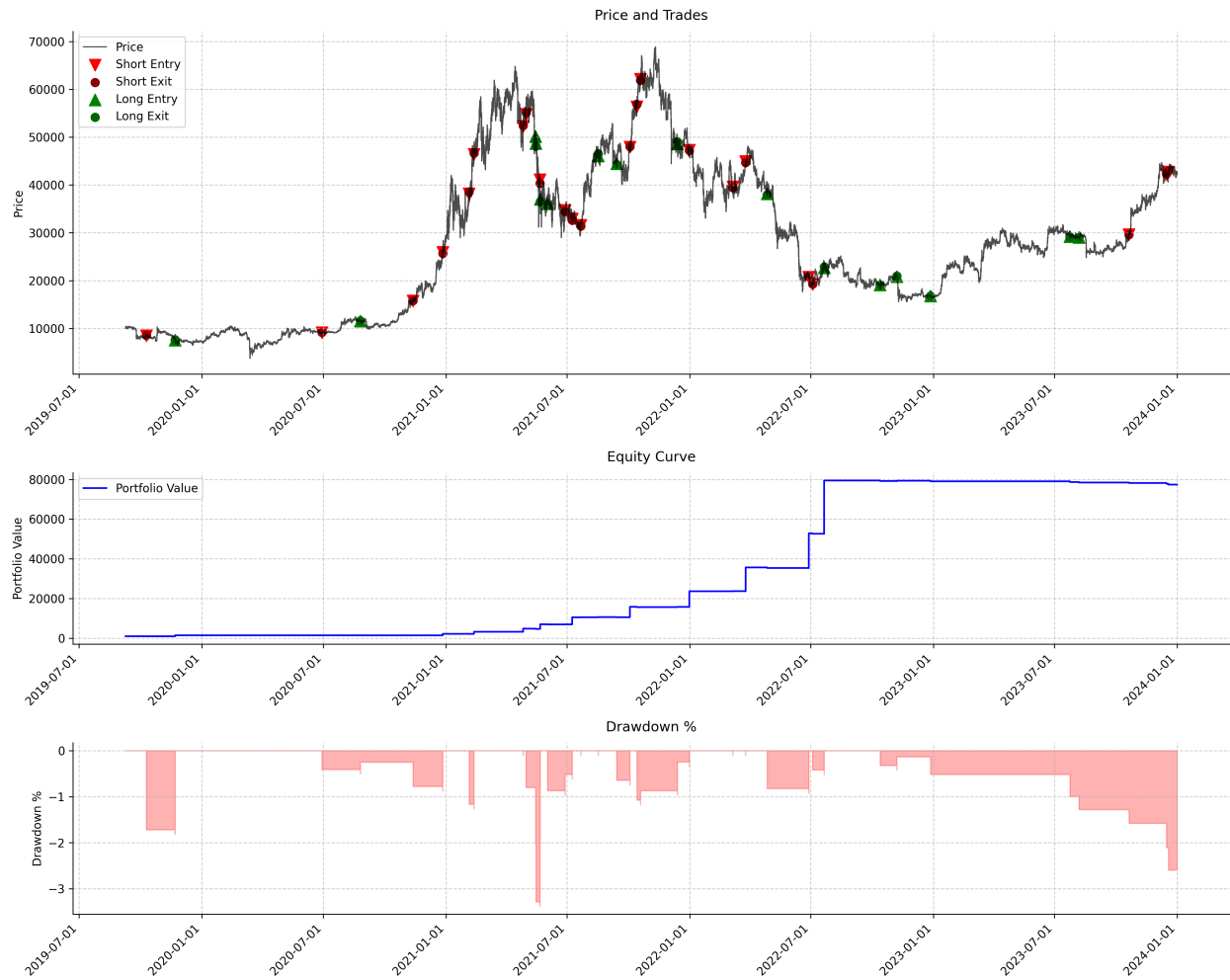


Figure 3: Equity Curve and Drawdown - 1-Minute Timeframe

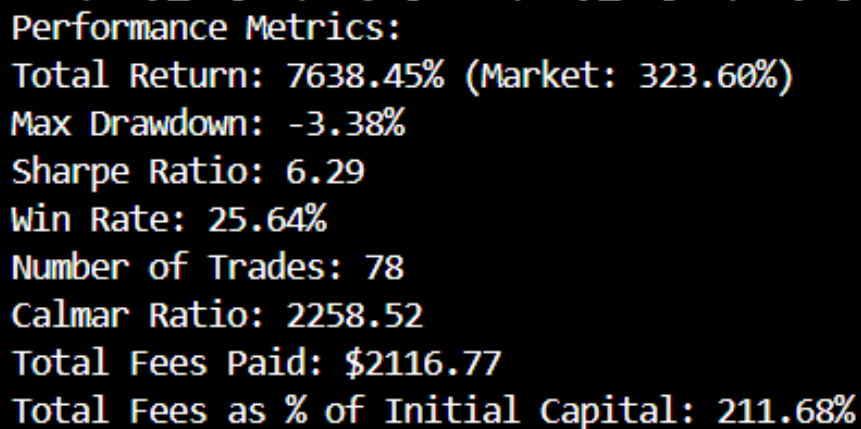
2.4 Last 10 trades executed

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 4: 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 5: Performance Metrics - 3-Minute Timeframe

3.2 Net Return value


$$(76.3845 \times 1000) - 2116.77 = 74,267.73$$

Figure 6: Net Return = (Overall return for initial 1000 dollar investment) - (Total fees paid)
- for 3-Minute Timeframe

3.3 Performance Graphs



Figure 7: Equity Curve and Drawdown - 3-Minute Timeframe

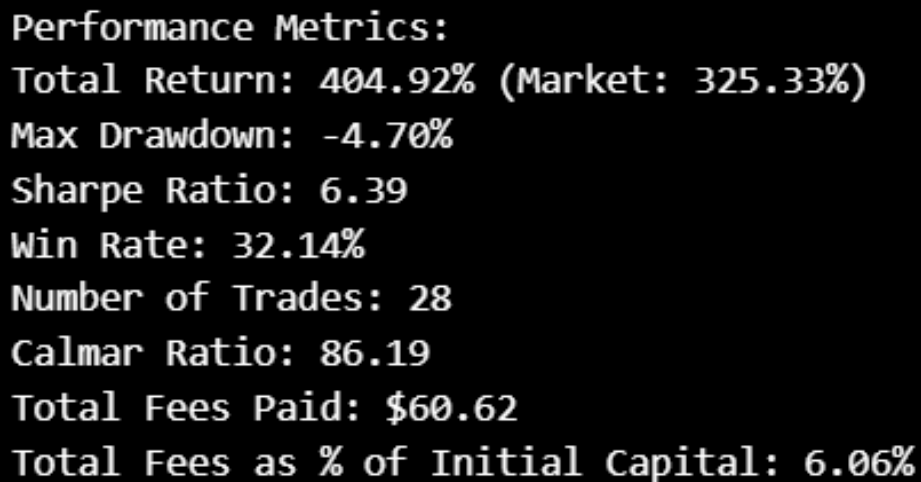
3.4 Last 10 trades executed

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 8: Last couple of trades executed- for 3-Minute Timeframe

4 15-Minute Timeframe Analysis

4.1 Performance Metrics



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 9: Performance Metrics - 15-Minute Timeframe

4.2 Net Return value


$$(4.0492 \times 1000) - 60.62 = 3,988.58$$

Figure 10: Net Return = (Overall return for initial 1000 dollar investment) - (Total fees paid) - for 15-Minute Timeframe

4.3 Performance Graphs



Figure 11: Equity Curve and Drawdown - 15-Minute Timeframe

4.4 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 12: 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