

# Cryptocurrency Trading Strategy Backtest Analysis Report

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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

```
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

### 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 Net Return value

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

Figure 5: Net Return = (Overall return for initial 1000 dollar investment) - (Total fees paid)  
- for 3-Minute Timeframe

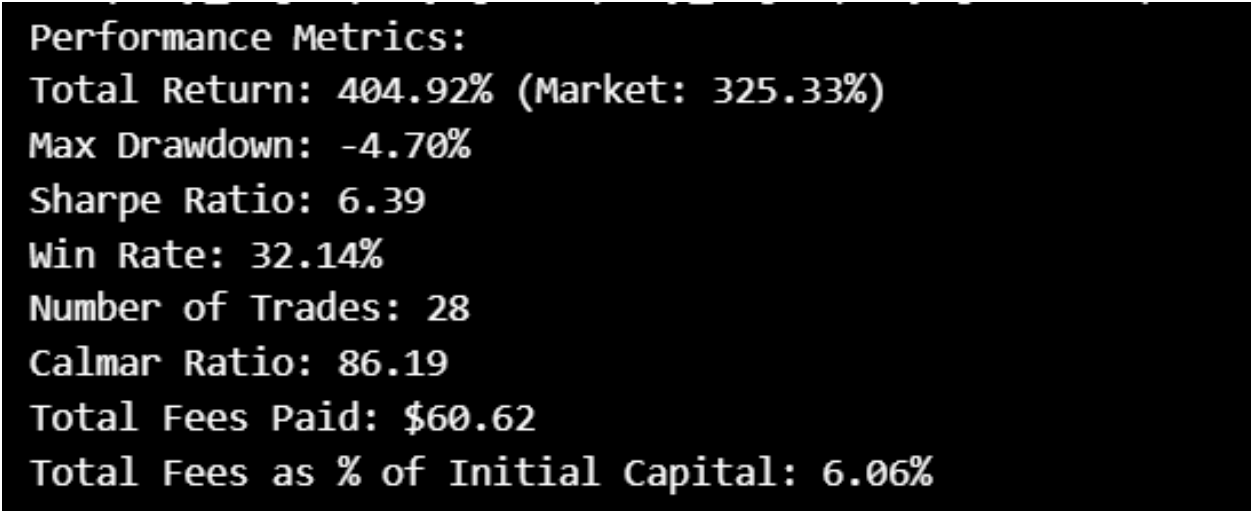
### 3.3 Performance Graphs



Figure 6: Equity Curve and Drawdown - 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 7: Performance Metrics - 15-Minute Timeframe

### 4.2 Net Return value


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

Figure 8: Net Return = (Overall return for initial 1000 dollar investment) - (Total fees paid)  
- for 15-Minute Timeframe



## 4.3 Performance Graphs



Figure 9: Equity Curve and Drawdown - 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