

# “Strategic Asset Allocation for Block chain-Based Algorithmic Trading”

## III. Performance Metrics Outline:

### 1. Return Metrics:

#### A. Return on Investment (ROI):

- Formula:  $((CurrentPortfolioValue - InitialInvestment) / InitialInvestment) \times 100$
- Rationale: Measures the profitability of the overall investment over time.

#### B. Risk-Adjusted Return:

- Sharpe Ratio:
  - Formula:
    - $ROI = ((CurrentPortfolioValue - InitialInvestment) / InitialInvestment) \times 100$
    - $SharpeRatio = (PortfolioReturn - Risk - FreeRate) / PortfolioSD$
  - Rationale: Evaluates the risk-adjusted performance by considering the volatility of returns.

### 2. Algorithmic Trading Efficiency:

#### A. Execution Speed:

- Average Trade Execution Time:
  - Calculation: Average time taken to execute trades.
  - Rationale: Reflects the efficiency of algorithmic trading in capturing market opportunities.

#### B. Slippage:

- Slippage Percentage:
  - Calculation:
$$((AverageExecutedPrice - ExpectedPrice) / ExpectedPrice) \times 100$$
  - Rationale: Measures the impact of price differences between expected and executed trades.

### 3. Portfolio Metrics:

#### A. Portfolio Diversification:

- Asset Allocation Ratio:
  - Calculation: Percentage allocation of each asset in the portfolio.
  - Rationale: Evaluates the diversification strategy and risk distribution.

#### B. Concentration Risk:

- Herfindahl-Hirschman Index (HHI):
  - Calculation:

$$HHI = \sum_{i=1}^n \left( \frac{MarketShare_i}{100} \right)^2$$

- Rationale: Measures the concentration of investments; lower values indicate better diversification.

### 4. Risk Metrics:

#### A. Volatility:

- Portfolio Volatility:
  - Calculation: Standard deviation of the portfolio's daily returns.
  - Rationale: Measures the degree of variation of the portfolio's returns.

#### B. Maximum Drawdown:

- Calculation: The maximum loss from a peak to a trough in portfolio value.
- Rationale: Indicates the largest loss an investor could have experienced.

### 5. Benchmarking Metrics:

#### A. Comparative Analysis:

- Alpha, Beta, and R-squared:
  - Calculation:
    - Alpha measures the excess return of the portfolio.
    - Beta measures the portfolio's sensitivity to market movements.
    - R-squared measures the proportion of portfolio variability explained by the benchmark.

- Rationale: Assesses how well the portfolio performed compared to a benchmark.

## **6. Qualitative Metrics:**

### **A. Strategy Adaptability:**

- Adaptation to Market Changes:
  - Assessment: Evaluate how well the algorithmic trading strategies adapt to changes in market conditions and regulatory environments.

### **B. Ethical Considerations:**

- Compliance with Ethical Standards:
  - Assessment: Ensure that the algorithmic trading strategies adhere to ethical guidelines and regulatory standards.

## **7. Reporting and Documentation:**

### **A. Performance Summary:**

- Executive Summary:
  - Content: Summarize key performance metrics and overall performance in a concise manner.

### **B. Visual Representation:**

- Graphs and Charts:
  - Content: Present key metrics visually through charts, graphs, and tables for better comprehension.

### **C. Comparative Analysis:**

- Benchmarking Report:
  - Content: Detail the methodology used for benchmarking against traditional markets or relevant indices.

## **8. Review and Continuous Improvement:**

- Regularly review the performance metrics, seeking areas for improvement and adjusting strategies accordingly.

This performance metrics outline provides a structured approach to evaluating the effectiveness and efficiency of blockchain-based algorithmic trading within a strategic asset allocation framework. It encompasses financial returns, risk

management, portfolio diversification, benchmarking, and qualitative aspects, offering a comprehensive view of the trading strategy's performance.