

CRY03: Corporate Bitcoin Treasury Analysis

Technical Analysis Report | February 01, 2026

1. Data Overview

Subject: MicroStrategy (MSTR)
Analysis Period: 2021-02-01 to 2026-01-30 (~5.0 years)
Total Observations: 8,019 rows across 4 datasets
Stock Data: 1,256 daily OHLCV observations
Data Sources: Yahoo Finance API, CoinGecko, exchange APIs (synthetic operational data)

2. Methodology

2.1 Metrics Computed

- BTC holdings per company
- NAV premium/discount calculation
- BTC beta and correlation analysis
- Financing activity tracking
- Cost basis estimation
- Stock vs BTC performance
- Convertible note analysis

2.2 Risk Analytics (CFA Standards)

- Sharpe Ratio:** $(\text{Return} - \text{Rf}) / \text{Volatility}$ ($\text{Rf} = 0$)
- Sortino Ratio:** $\text{Return} / \text{Downside Deviation}$
- Value at Risk (VaR):** Historical 95% and 99% confidence
- Maximum Drawdown:** Peak-to-trough decline

2.3 Crypto-Specific Indicators

- Volume Analysis:** On-chain vs exchange volume
- Volatility:** Rolling 30-day realized volatility
- Correlation:** BTC/ETH correlation, equity beta

3. Risk Metrics Summary

Ticker	Total Return	Ann. Return	Volatility	Sharpe	Max DD
MSTR	135.9%	18.8%	93.7%	0.20	-89.3%

4. Detailed Risk Profile

Return Distribution

Metric	Value
Positive Days	49.2%
Best Day	29.16%
Worst Day	-25.55%
Sortino Ratio	0.32

Value at Risk

Confidence	Daily VaR
95%	-8.23%
99%	-14.87%

5. Data Quality Assessment

Completeness: All trading days covered for analysis period
Stock Data: Yahoo Finance adjusted prices (splits, dividends)
Market Data: Synthetic/illustrative for portfolio demonstration

Processing: Pandas DataFrame operations with NumPy calculations
Disclaimer: Market metrics are synthetic; stock performance is verified

6. Key Observations

- Crypto equities exhibit extreme volatility compared to traditional assets
 - High correlation with Bitcoin price movements
 - Regulatory developments significantly impact valuations
 - Trading volume and liquidity vary significantly across exchanges
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Data Source: Yahoo Finance (stock), Synthetic (market) | Report Code: CRY03
Portfolio Sample - Demonstrates data engineering methodology
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