

Portfolio Risk Analysis Report

Report Date: October 15, 2025

Portfolio Size: 20 Assets

Analysis Period: 12 Months

Generated by: Automated Risk Analysis Pipeline

Risk Assessment Summary

HIGH RISK (RED): 5 Assets

MEDIUM RISK (YELLOW): 0 Assets

LOW RISK (GREEN): 15 Assets

Executive Summary

This report presents a comprehensive risk analysis of a portfolio containing 20 assets with a combined market capitalization of \$3349.5 billion. **Key Findings:** • 5 assets (25.0%) are rated as HIGH RISK (RED) • 0 assets (0.0%) are rated as MEDIUM RISK (YELLOW) • Average portfolio volatility: 54.9% • Maximum drawdown observed: -23.9% **Risk Concentration:** The analysis reveals significant risk concentration in 5 assets requiring immediate attention and potential portfolio rebalancing. **Sentiment Analysis:** • 4 RED-flagged assets show negative market sentiment • Average sentiment score for flagged assets: -0.293 • News coverage indicates heightened market concern for these positions

Portfolio Overview

Sector Allocation

| Sector | Assets | Market Cap (\$B) | Percentage |
|------------------------|--------|------------------|------------|
| Technology | 10 | 2134.41 | 63.7% |
| Healthcare | 3 | 407.94 | 12.2% |
| Consumer Discretionary | 2 | 403.56 | 12.0% |
| Financial Services | 1 | 361.40 | 10.8% |
| Industrial | 1 | 21.45 | 0.6% |
| Energy | 2 | 17.20 | 0.5% |
| Materials | 1 | 3.55 | 0.1% |

Risk Analysis Results

Risk Distribution:

- HIGH RISK (RED): 5 assets
- MEDIUM RISK (YELLOW): 0 assets
- LOW RISK (GREEN): 15 assets

High Risk Assets

| Symbol | Sector | Risk Rating | Volatility | Max Drawdown | Risk Score |
|--------|------------------------|-------------|------------|--------------|------------|
| TDUP | Consumer Discretionary | RED | 60.6% | -20.8% | 3 |
| AEVA | Technology | RED | 104.6% | -21.9% | 2 |
| QUBT | Technology | RED | 154.9% | -23.9% | 2 |
| OKLO | Energy | RED | 138.8% | -23.0% | 2 |
| CTRX | Healthcare | RED | 15.2% | -21.1% | 1 |

Machine Learning Analysis

Advanced machine learning techniques were applied to identify anomalies and predict future risk ratings. **Anomaly Detection Summary:**

- Total Anomalies Detected: 3
- Critical Anomalies: 1
- High Risk Anomalies: 2
- Anomaly Rate: 15.0%

Risk Prediction Model:

- Model Accuracy: 83.3%
- Rating Changes Predicted: 1
- Assets Predicted to Deteriorate: 1
- Assets Predicted to Improve: 0

Key Machine Learning Insights

- 1 assets show critical anomalous behavior requiring immediate review
- 1 assets predicted to deteriorate in risk rating
- Anomaly detection identified 3 assets with unusual patterns
- Key risk drivers: Max Drawdown, Volatility, Volume Decline

Critical Anomalies Detected

| Symbol | Sector | Anomaly Score | Severity | Recommendation |
|--------|------------|---------------|----------|---|
| CTRX | Healthcare | 100.0 | CRITICAL | Critical anomaly - Consider immediate po... |
| OKLO | Energy | 74.2 | HIGH | Significant anomaly - Conduct thorough d... |
| USAS | Materials | 61.0 | HIGH | Significant anomaly - Conduct thorough d... |

Predicted Risk Rating Changes

| Symbol | Current Rating | Predicted Rating | Confidence | Trend |
|--------|----------------|------------------|------------|---------------|
| SERV | GREEN | RED | 87.0% | DETERIORATING |

Top Risk Factors (Feature Importance)

1. Max Drawdown: 47.1% importance
2. Volatility: 15.0% importance
3. Volume Decline: 12.3% importance
4. Rsi: 7.7% importance
5. Price Change 1M: 7.3% importance

ML Validation Results

Overall Validation Status: **PASS**
Checks Passed: 4 / 4

✓ Anomaly Detection Validation: PASS

total_assets: 20, anomalies_detected: 3, anomaly_rate: 15.0
 ✓ **Risk Prediction Validation:** PASS
 model_accuracy: 83.3, predictions_made: 20, rating_changes: 1
 ✓ **Feature Quality Validation:** PASS
 features_checked: 9, nan_features: 0, total_samples: 20
 ✓ **Feature Importance Validation:** PASS
 total_importance: 100.0, top_feature: Max Drawdown, top_importance: 47.1

Sentiment Analysis

Sentiment analysis was conducted on 5 RED-flagged assets using financial news from the past 12 months. **Key Findings:**

- Average sentiment score: -0.293
- Assets with negative sentiment: 4/5
- Total news articles analyzed: 121

Sentiment Analysis Results

| Symbol | Sentiment Score | Label | News Count | Trend | Key Themes |
|--------|-----------------|----------|------------|---------------|--|
| OKLO | -0.354 | NEGATIVE | 26 | IMPROVING | regulatory, financial_health, earnings |
| AEVA | -0.317 | NEGATIVE | 22 | IMPROVING | regulatory, financial_health, operations |
| TDUP | -0.305 | NEGATIVE | 22 | STABLE | regulatory, operations, earnings |
| CTRX | -0.304 | NEGATIVE | 27 | DETERIORATING | earnings, regulatory, financial_health |
| QUBT | -0.187 | NEUTRAL | 24 | DETERIORATING | earnings, financial_health, growth |

Detailed Asset Analysis

Asset: TDUP

Sector: Consumer Discretionary

Current Price: \$9.41

Market Cap: \$11.17B

Risk Rating: RED

Risk Metrics:

- Volatility: 60.6%
- Maximum Drawdown: -20.8%
- Beta: 1.00
- Sharpe Ratio: -2.45
- RSI: 49.2

Performance:

- 1-Month Return: -8.2%
- 3-Month Return: 0.0%
- 6-Month Return: 0.0%

Risk Flags:

- High Volatility, Extreme Drawdown, Poor Risk Return

Market Sentiment:

- Sentiment Score: -0.305 (NEGATIVE)

- News Articles: 22
- Trend: STABLE

Asset: AEVA

Sector: Technology

Current Price: \$18.10

Market Cap: \$4.60B

Risk Rating: RED

Risk Metrics:

- Volatility: 104.6%
- Maximum Drawdown: -21.9%
- Beta: 1.00
- Sharpe Ratio: 1.75
- RSI: 57.3

Performance:

- 1-Month Return: 18.7%
- 3-Month Return: 0.0%
- 6-Month Return: 0.0%

Risk Flags:

- High Volatility, Extreme Drawdown

Market Sentiment:

- Sentiment Score: -0.317 (NEGATIVE)
- News Articles: 22
- Trend: IMPROVING

Asset: QUBT

Sector: Technology

Current Price: \$21.83

Market Cap: \$34.25B

Risk Rating: RED

Risk Metrics:

- Volatility: 154.9%
- Maximum Drawdown: -23.9%
- Beta: 1.00
- Sharpe Ratio: 2.73
- RSI: 52.1

Performance:

- 1-Month Return: 29.6%
- 3-Month Return: 0.0%
- 6-Month Return: 0.0%

Risk Flags:

- High Volatility, Extreme Drawdown

Market Sentiment:

- Sentiment Score: -0.187 (NEUTRAL)
- News Articles: 24
- Trend: DETERIORATING

Asset: OKLO

Sector: Energy

Current Price: \$177.40

Market Cap: \$14.47B

Risk Rating: RED

Risk Metrics:

- Volatility: 138.8%
- Maximum Drawdown: -23.0%
- Beta: 1.00
- Sharpe Ratio: 6.02
- RSI: 70.6

Performance:

- 1-Month Return: 86.1%
- 3-Month Return: 0.0%
- 6-Month Return: 0.0%

Risk Flags:

- High Volatility, Extreme Drawdown

Market Sentiment:

- Sentiment Score: -0.354 (NEGATIVE)
- News Articles: 26
- Trend: IMPROVING

Asset: CTRX

Sector: Healthcare

Current Price: \$227.31

Market Cap: \$149.64B

Risk Rating: RED

Risk Metrics:

- Volatility: 15.2%
- Maximum Drawdown: -21.1%
- Beta: 0.01
- Sharpe Ratio: -0.20
- RSI: 59.0

Performance:

- 1-Month Return: 3.9%
- 3-Month Return: 10.1%
- 6-Month Return: 9.8%

Risk Flags:

- Extreme Drawdown

Market Sentiment:

- Sentiment Score: -0.304 (NEGATIVE)
- News Articles: 27
- Trend: DETERIORATING

Recommendations

Based on the comprehensive risk analysis, the following recommendations are provided:

Immediate Actions (RED-flagged assets):

1. Consider reducing position sizes for 5 high-risk assets
2. Implement stop-loss orders to limit further downside exposure
3. Review fundamental analysis for potential divestiture candidates
4. Monitor daily price movements and news flow closely

Medium-term Actions (YELLOW-flagged assets):

1. Conduct deeper due diligence on 0 medium-risk assets
2. Consider hedging strategies for positions with high volatility
3. Review correlation with overall portfolio risk
4. Set up enhanced monitoring and alerts

Portfolio-level Recommendations:

1. Diversify across sectors to reduce concentration risk
2. Consider alternative investments to reduce correlation
3. Implement systematic risk management framework

4. Schedule monthly portfolio risk reviews

Sentiment-based Actions:

1. Monitor news flow for 4 assets with negative sentiment
2. Consider contrarian opportunities if fundamentals remain strong
3. Assess impact of market sentiment on price movements
4. Review analyst coverage and institutional positioning

Appendix

Methodology

This risk analysis employs a four-stage pipeline methodology:

- Stage 1 - Data Ingestion:** • Historical price data (252 trading days) • Trading volume information • Market capitalization data • Sector classifications
- Stage 2 - Core Analysis:** • Volatility calculation (annualized) • Maximum drawdown analysis • Beta coefficient estimation • Risk-adjusted return metrics (Sharpe ratio) • Technical indicators (RSI) • Rule-based risk flagging system
- Stage 3 - Sentiment Analysis:** • News article collection (12-month lookback) • Natural language processing for sentiment scoring • Trend analysis and confidence metrics • Key theme extraction
- Stage 4 - Report Generation:** • Comprehensive risk assessment compilation • Visual data presentation • Actionable recommendations • Professional PDF report output

Risk Assessment Thresholds

RED Flag Thresholds: • Volatility > 40% (annualized) • Maximum drawdown < -20% • Volume decline > 50% • 1-month price decline > 15% **YELLOW Flag Thresholds:** • Volatility > 25% (annualized) • Maximum drawdown < -10% • Volume decline > 30% • Multiple warning indicators present **Sentiment Thresholds:** • Negative sentiment: Score < -0.3 • Positive sentiment: Score > 0.3 • Neutral sentiment: -0.3 ≤ Score ≤ 0.3

Report Generation Details:

- Generated: 2025-10-15 17:41:43
- Analysis Period: 12 months
- Total Assets Analyzed: 20
- Pipeline Version: 1.0

Test Data - Portfolio Details

Complete portfolio and risk analysis data has been exported to CSV files for further analysis:

Portfolio Data CSV: portfolio_data_20251015_174143.csv

Risk Analysis CSV: risk_analysis_20251015_174143.csv

The tables below provide summary information for quick reference.

Performance Metrics Data

| Symbol | 1M Return | 3M Return | 6M Return | Vol Decline | Sharpe Ratio |
|--------|-----------|-----------|-----------|-------------|--------------|
| AAPL | 4.0% | 0.0% | 0.0% | 0.5% | 2.24 |
| AEVA | 18.7% | 0.0% | 0.0% | 1.7% | 1.75 |
| AMZN | -7.2% | 0.0% | 0.0% | 2.8% | -2.86 |
| ATRO | 16.5% | 0.0% | 0.0% | 2.3% | 6.38 |
| CTRX | 3.9% | 10.1% | 9.8% | 7.8% | -0.20 |
| EVGO | 4.3% | 0.0% | 0.0% | 0.8% | 1.60 |
| GOOGL | -2.3% | 0.0% | 0.0% | -4.2% | -1.72 |
| IBM | 7.4% | 0.0% | 0.0% | 3.0% | 3.28 |
| IKT | 3.2% | 0.0% | 0.0% | 2.6% | 0.40 |
| JNJ | 8.3% | 0.0% | 0.0% | 2.9% | 7.10 |
| JPM | -1.9% | 0.0% | 0.0% | 1.5% | -0.96 |
| META | -8.9% | 0.0% | 0.0% | 1.5% | -3.87 |
| MSFT | 0.6% | 0.0% | 0.0% | 0.8% | -0.43 |
| NVDA | 3.5% | 0.0% | 0.0% | 2.2% | 0.85 |
| OKLO | 86.1% | 0.0% | 0.0% | 0.8% | 6.02 |
| QUBT | 29.6% | 0.0% | 0.0% | 5.4% | 2.73 |
| SERV | 36.4% | 0.0% | 0.0% | 4.5% | 3.01 |
| TDUP | -8.2% | 0.0% | 0.0% | 1.3% | -2.45 |
| TSM | 12.8% | 0.0% | 0.0% | 3.6% | 3.82 |
| USAS | 56.5% | 0.0% | 0.0% | 4.0% | 8.19 |

Risk Flags Details

| Symbol | High Vol | Ext. DD | Vol Collapse | Severe Dec | Ext. Dec | Poor Sharpe | Mom. Break |
|--------|----------|---------|--------------|------------|----------|-------------|------------|
| TDUP | ✓ | ✓ | ✗ | ✗ | ✗ | ✓ | ✗ |
| AEVA | ✓ | ✓ | ✗ | ✗ | ✗ | ✗ | ✗ |
| QUBT | ✓ | ✓ | ✗ | ✗ | ✗ | ✗ | ✗ |
| OKLO | ✓ | ✓ | ✗ | ✗ | ✗ | ✗ | ✗ |
| GOOGL | ✗ | ✗ | ✗ | ✗ | ✗ | ✓ | ✗ |

| | | | | | | | |
|------|---|---|---|---|---|---|---|
| AMZN | x | x | x | x | x | ✓ | x |
| META | x | x | x | x | x | ✓ | x |
| TSM | ✓ | x | x | x | x | x | x |
| JPM | x | x | x | x | x | ✓ | x |
| SERV | ✓ | x | x | x | x | x | x |
| EVGO | ✓ | x | x | x | x | x | x |
| USAS | ✓ | x | x | x | x | x | x |
| CTRX | x | ✓ | x | x | x | x | x |
| IKT | ✓ | x | x | x | x | x | x |
| AAPL | x | x | x | x | x | x | x |
| MSFT | x | x | x | x | x | x | x |
| NVDA | x | x | x | x | x | x | x |
| IBM | x | x | x | x | x | x | x |
| JNJ | x | x | x | x | x | x | x |
| ATRO | x | x | x | x | x | x | x |

Data Summary:

- Total Assets: 20
- Data Generated: 2025-10-15 17:41:43
- Note: This test data is provided for further analysis, validation, and detailed review purposes.
- All metrics are calculated from 252 trading days of historical data.