Portfolio Risk Analysis Report

Report Date: October 23, 2025
Portfolio Size: 45 Assets
Analysis Period: 52 Weeks (Weekly Data)
Data Frequency: Weekly Adjusted Prices
Generated by: Automated Risk Analysis Pipeline

Risk Assessment Summary

HIGH RISK (RED): 25 Assets
MEDIUM RISK (YELLOW): 0 Assets
LOW RISK (GREEN): 20 Assets

Executive Summary

This report presents a comprehensive risk analysis of a portfolio containing 45 assets with a combined market capitalization of $7767.8 billion. Analysis is based on weekly adjusted price data covering approximately 52 weeks of trading history. **Key Findings:** • 25 assets (55.6%) are rated as HIGH RISK (RED) • 0 assets (0.0%) are rated as MEDIUM RISK (YELLOW) • Average portfolio volatility (annualized): 31.6% • Maximum drawdown observed: -60.4% **Risk Concentration:** The analysis reveals significant risk concentration in 25 assets requiring immediate attention and potential portfolio rebalancing. **Sentiment Analysis:** • 17 RED-flagged assets show negative market sentiment • Average sentiment score for flagged assets: -0.322 • News coverage indicates heightened market concern for these positions

Portfolio Overview

Sector Allocation

Sector	Assets	Market Cap ($B)	Percentage
Technology	16	3609.16	46.5%
Consumer Discretionary	11	2027.47	26.1%
Consumer Staples	5	705.64	9.1%
Healthcare	3	536.58	6.9%
Financial Services	3	411.32	5.3%
Energy	5	386.64	5.0%
Industrial	2	90.97	1.2%

Risk Analysis Results

Risk Distribution:
• HIGH RISK (RED): 25 assets
• MEDIUM RISK (YELLOW): 0 assets
• LOW RISK (GREEN): 20 assets

High Risk Assets

Symbol	Sector	Risk Rating	Volatility (Annualized)	Max Drawdown	Risk Score
BYND	Consumer Staples	RED	37.5%	-50.7%	5
FHTX	Healthcare	RED	39.8%	-25.8%	4
UNH	Healthcare	RED	54.2%	-60.4%	3
SNAP	Technology	RED	44.2%	-42.7%	3
DOCU	Technology	RED	55.1%	-36.5%	3
AMD	Technology	RED	38.9%	-40.7%	3

AMC	Consumer Discretionary	RED	35.6%	-34.6%	3
WKHS	Consumer Discretionary	RED	41.7%	-37.1%	3
BLNK	Energy	RED	43.5%	-47.0%	3
CRM	Technology	RED	30.0%	-33.4%	2
NOW	Technology	RED	38.3%	-35.9%	2
SBUX	Consumer Discretionary	RED	35.6%	-31.3%	2
BA	Industrial	RED	40.9%	-25.9%	2
LYFT	Technology	RED	57.6%	-37.6%	2
TWLO	Technology	RED	54.0%	-43.0%	2
ETSY	Consumer Discretionary	RED	45.0%	-31.3%	2
TSLA	Consumer Discretionary	RED	34.4%	-36.3%	2
GME	Consumer Discretionary	RED	44.5%	-21.2%	2
FUBO	Technology	RED	35.1%	-31.0%	2
PLTR	Technology	RED	19.0%	-44.2%	2
AAPL	Technology	RED	33.3%	-26.2%	1
GM	Consumer Discretionary	RED	32.1%	-25.1%	1
ZM	Technology	RED	30.5%	-22.1%	1
SPCE	Industrial	RED	26.7%	-21.5%	1
FCEL	Energy	RED	31.5%	-26.3%	1

Machine Learning Analysis

Advanced machine learning techniques were applied to identify anomalies and predict future risk ratings. **Anomaly Detection Summary:**
• Total Anomalies Detected: 7
• Critical Anomalies: 3
• High Risk Anomalies: 5
• Anomaly Rate: 15.6%
Risk Prediction Model:
• Model Accuracy: 92.9%
• Rating Changes Predicted: 1
• Assets Predicted to Deteriorate: 0
• Assets Predicted to Improve: 1

Key Machine Learning Insights

• 3 assets show critical anomalous behavior requiring immediate review
• Anomaly detection identified 7 assets with unusual patterns
• Key risk drivers: Max Drawdown, Volatility, Price Change 3M

Critical Anomalies Detected

Symbol	Sector	Anomaly Score	Severity	Recommendation

LYFT	Technology	100.0	CRITICAL	Critical anomaly - Consider immediate po...
UNH	Healthcare	91.1	CRITICAL	Critical anomaly - Consider immediate po...
PLTR	Technology	82.2	CRITICAL	Critical anomaly - Consider immediate po...
GM	Consumer Discretionary	79.7	HIGH	Significant anomaly - Conduct thorough d...
TWLO	Technology	77.8	HIGH	Significant anomaly - Conduct thorough d...
BYND	Consumer Staples	64.0	HIGH	Significant anomaly - Conduct thorough d...
GME	Consumer Discretionary	63.9	HIGH	Significant anomaly - Conduct thorough d...
DOCU	Technology	61.0	HIGH	Normal behavior pattern - Continue monit...

Predicted Risk Rating Changes

Symbol	Current Rating	Predicted Rating	Confidence	Trend
SPCE	RED	GREEN	66.0%	IMPROVING

Top Risk Factors (Feature Importance)

1. Max Drawdown: 52.1% importance
2. Volatility: 25.1% importance
3. Price Change 3M: 5.5% importance
4. Sharpe Ratio: 4.7% importance
5. Price Change 6M: 4.4% importance

ML Validation Results

Overall Validation Status: PASS
Checks Passed: 4 / 4

✓ **Anomaly Detection Validation:** PASS
total_assets: 45, anomalies_detected: 7, anomaly_rate: 15.6
✓ **Risk Prediction Validation:** PASS
model_accuracy: 92.9, predictions_made: 45, rating_changes: 1
✓ **Feature Quality Validation:** PASS
features_checked: 9, nan_features: 0, total_samples: 45
✓ **Feature Importance Validation:** PASS
total_importance: 100.0, top_feature: Max Drawdown, top_importance: 52.1

Sentiment Analysis

Sentiment analysis was conducted on 25 RED-flagged assets using financial news from the past 12 months. **Key Findings:**
• Average sentiment score: -0.322
• Assets with negative sentiment: 17/25
• Total news articles analyzed: 559

Sentiment Analysis Results

Symbol	Sentiment Score	Label	News Count	Trend	Key Themes
AAPL	-0.466	NEGATIVE	30	STABLE	market_share, earnings, regulatory
ZM	-0.419	NEGATIVE	18	IMPROVING	earnings, market_share, regulatory
ETSY	-0.410	NEGATIVE	18	IMPROVING	market_share, operations, earnings
DOCU	-0.404	NEGATIVE	25	IMPROVING	earnings, market_share, regulatory
FCEL	-0.401	NEGATIVE	25	STABLE	regulatory, market_share, earnings
LYFT	-0.382	NEGATIVE	28	DETERIORATING	earnings, market_share, regulatory
UNH	-0.360	NEGATIVE	17	IMPROVING	earnings, market_share, regulatory
WKHS	-0.359	NEGATIVE	24	DETERIORATING	earnings, regulatory, market_share
TWLO	-0.355	NEGATIVE	24	IMPROVING	earnings, market_share, regulatory
AMD	-0.350	NEGATIVE	30	IMPROVING	earnings, market_share, regulatory
TSLA	-0.344	NEGATIVE	17	IMPROVING	earnings, market_share, financial_health
BA	-0.315	NEGATIVE	15	DETERIORATING	earnings, market_share, regulatory
FUBO	-0.313	NEGATIVE	22	STABLE	market_share, earnings, financial_health
BYND	-0.312	NEGATIVE	24	IMPROVING	earnings, market_share, regulatory
GM	-0.308	NEGATIVE	25	DETERIORATING	market_share, regulatory, financial_health
FHTX	-0.306	NEGATIVE	24	DETERIORATING	earnings, market_share, regulatory
AMC	-0.301	NEGATIVE	29	STABLE	earnings, market_share, regulatory
SNAP	-0.280	NEUTRAL	29	STABLE	earnings, market_share, financial_health
CRM	-0.279	NEUTRAL	22	STABLE	earnings, regulatory, market_share
SBUX	-0.269	NEUTRAL	20	DETERIORATING	market_share, earnings, regulatory
NOW	-0.267	NEUTRAL	23	DETERIORATING	earnings, regulatory, market_share
SPCE	-0.254	NEUTRAL	23	DETERIORATING	earnings, market_share, regulatory
GME	-0.235	NEUTRAL	15	IMPROVING	earnings, financial_health, regulatory
PLTR	-0.223	NEUTRAL	17	IMPROVING	earnings, regulatory, market_share
BLNK	-0.138	NEUTRAL	15	DETERIORATING	earnings, market_share, regulatory

Detailed Asset Analysis

Asset: BYND

Sector: Consumer Staples
Current Price: $93.65
Market Cap: $108.45B
Risk Rating: RED
Risk Metrics:
• Volatility: 37.5%
• Maximum Drawdown: -50.7%
• Beta: -0.14
• Sharpe Ratio: -1.81
• RSI: 30.8

Performance:
• 1-Month Return: -10.4%
• 3-Month Return: -30.0%
• 6-Month Return: -12.2%
Risk Flags:
• High Volatility, Extreme Drawdown, Extended Decline, Poor Risk Return, Momentum Breakdown
Market Sentiment:
• Sentiment Score: -0.312 (NEGATIVE)
• News Articles: 24
• Trend: IMPROVING

Asset: FHTX

Sector: Healthcare
Current Price: $106.51
Market Cap: $67.98B
Risk Rating: RED
Risk Metrics:
• Volatility: 39.8%
• Maximum Drawdown: -25.8%
• Beta: 0.20
• Sharpe Ratio: -0.38
• RSI: 44.6
Performance:
• 1-Month Return: -15.3%
• 3-Month Return: -11.3%
• 6-Month Return: -16.7%
Risk Flags:
• High Volatility, Extreme Drawdown, Severe Decline, Momentum Breakdown
Market Sentiment:
• Sentiment Score: -0.306 (NEGATIVE)
• News Articles: 24
• Trend: DETERIORATING

Asset: UNH

Sector: Healthcare
Current Price: $361.49
Market Cap: $94.41B
Risk Rating: RED
Risk Metrics:
• Volatility: 54.2%
• Maximum Drawdown: -60.4%
• Beta: 0.56
• Sharpe Ratio: -0.67
• RSI: 69.3
Performance:
• 1-Month Return: 5.1%
• 3-Month Return: 29.4%
• 6-Month Return: -12.5%
Risk Flags:
• High Volatility, Extreme Drawdown, Poor Risk Return
Market Sentiment:
• Sentiment Score: -0.360 (NEGATIVE)
• News Articles: 17
• Trend: IMPROVING

Asset: SNAP

Sector: Technology
Current Price: $7.77
Market Cap: $14.82B
Risk Rating: RED
Risk Metrics:
• Volatility: 44.2%
• Maximum Drawdown: -42.7%
• Beta: 1.45
• Sharpe Ratio: -0.56
• RSI: 29.2
Performance:
• 1-Month Return: -6.0%
• 3-Month Return: -20.5%
• 6-Month Return: -9.0%
Risk Flags:
• High Volatility, Extreme Drawdown, Poor Risk Return
Market Sentiment:
• Sentiment Score: -0.280 (NEUTRAL)
• News Articles: 29
• Trend: STABLE

Asset: DOCU

Sector: Technology
Current Price: $70.56
Market Cap: $132.45B
Risk Rating: RED
Risk Metrics:
• Volatility: 55.1%
• Maximum Drawdown: -36.5%
• Beta: 0.50
• Sharpe Ratio: 0.00
• RSI: 40.4
Performance:
• 1-Month Return: -13.4%
• 3-Month Return: -11.7%
• 6-Month Return: -14.8%
Risk Flags:
• High Volatility, Extreme Drawdown, Momentum Breakdown
Market Sentiment:
• Sentiment Score: -0.404 (NEGATIVE)
• News Articles: 25
• Trend: IMPROVING

Recommendations

Based on the comprehensive risk analysis, the following recommendations are provided:
Immediate Actions (RED-flagged assets):
1. Consider reducing position sizes for 25 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 17 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 five-stage pipeline methodology using weekly data: **Stage 1 - Data Ingestion:** • Weekly adjusted price data (~52 weeks of history) • Weekly trading volume information • Market capitalization data • Sector classifications • Data source: Alpha Vantage API (weekly adjusted series) **Stage 2 - Core Analysis:** • Volatility calculation (annualized using √52 factor for weekly data) • Maximum drawdown analysis on weekly cumulative returns • Beta coefficient estimation • Risk-adjusted return metrics (Sharpe ratio, annualized) • Technical indicators (RSI with 14-week period) • Price momentum analysis (4/13/26-week lookback periods) • Volume trend analysis (4/12-week windows) • Rule-based risk flagging system calibrated for weekly data **Stage 3 - ML Analysis:** • Anomaly detection using Isolation Forest algorithm • Risk prediction using Random Forest Classifier • Feature importance analysis • ML validation and quality checks **Stage 4 - Sentiment Analysis:** • News article collection for RED-flagged assets only • Natural language processing for sentiment scoring (TextBlob) • Trend analysis and confidence metrics • Key theme extraction from financial news **Stage 5 - Report Generation:** • Comprehensive risk assessment compilation • Visual data presentation with weekly time axes • Actionable recommendations • Professional PDF report output with CSV exports

Risk Assessment Thresholds

RED Flag Thresholds (calibrated for weekly data): • Volatility > 35% (annualized from weekly returns using √52) • Maximum drawdown < -20% • Volume decline > 50% (comparing 4-week vs 12-week averages) • 1-month price decline > 15% **YELLOW Flag Thresholds (calibrated for weekly data):** • Volatility > 22% (annualized from weekly returns using √52) • 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: 2025-10-23 14:00:16
• Analysis Period: 12 months
• Total Assets Analyzed: 45
• 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_20251023_140016.csv
Risk Analysis CSV: risk_analysis_20251023_140016.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	1.2%	21.0%	23.8%	-21.9%	0.56
AMC	1.0%	-6.5%	-11.6%	15.9%	-0.65
AMD	4.3%	-8.7%	0.5%	-7.4%	-1.07
BA	-2.1%	-7.1%	21.7%	-1.2%	1.30
BLNK	-8.6%	9.7%	-9.6%	-5.2%	-0.95
BYND	-10.4%	-30.0%	-12.2%	-8.7%	-1.81
CRM	5.4%	-4.5%	-3.9%	0.1%	-0.73
CVX	-2.9%	1.6%	14.8%	-16.6%	0.09
DOCU	-13.4%	-11.7%	-14.8%	11.7%	0.00
ETSY	-1.0%	-22.4%	-3.5%	4.2%	1.49
FCEL	2.0%	5.5%	-1.1%	10.7%	-0.15
FHTX	-15.3%	-11.3%	-16.7%	-1.3%	-0.38
FUBO	7.6%	-8.3%	-9.4%	-21.8%	0.00
GM	9.9%	26.4%	43.7%	24.5%	0.68
GME	-2.3%	38.1%	43.5%	-8.5%	1.50
HD	-5.2%	4.2%	10.1%	-17.2%	-0.10
IBM	1.1%	11.5%	25.4%	-7.4%	1.40
JNJ	7.4%	15.5%	26.8%	-2.3%	1.63
KO	7.8%	3.2%	-0.1%	-6.0%	1.16
LYFT	-7.4%	41.7%	65.9%	-31.0%	0.44
MA	1.2%	0.7%	7.4%	-5.7%	0.49
MCD	1.6%	4.5%	-1.0%	-15.5%	0.50
MSFT	1.8%	1.5%	33.3%	-15.9%	1.14
NKLA	8.4%	18.5%	29.6%	11.3%	0.57
NOW	-0.0%	-3.4%	-1.0%	-26.4%	-0.08
NVDA	6.9%	9.6%	8.6%	-13.1%	-0.11
PEP	9.0%	7.7%	17.1%	-4.6%	0.01
PG	-0.2%	-3.9%	-4.8%	-2.5%	-0.59
PLTR	1.4%	-14.5%	-28.2%	-19.7%	-2.80
PLUG	5.2%	1.4%	-9.1%	10.8%	-0.25

RIVN	-1.0%	0.7%	0.3%	18.3%	0.17
SBUX	2.5%	-8.8%	3.4%	-0.1%	-0.24
SHOP	3.5%	11.1%	32.2%	4.3%	2.03
SNAP	-6.0%	-20.5%	-9.0%	-3.6%	-0.56
SPCE	-1.7%	9.2%	19.9%	-9.8%	0.91
SQ	15.9%	16.8%	32.6%	-6.2%	1.24
TSLA	14.2%	2.7%	-12.4%	10.7%	-0.71
TWLO	6.9%	-16.5%	15.1%	-36.1%	0.48
UBER	-6.3%	1.0%	18.6%	-22.2%	0.80
UNH	5.1%	29.4%	-12.5%	-44.6%	-0.67
V	2.4%	-3.1%	3.4%	-10.9%	0.59
WKHS	1.5%	-0.9%	-8.5%	-25.3%	-0.59
WMT	3.9%	10.2%	13.2%	-12.3%	1.08
XOM	-2.1%	4.9%	7.6%	-18.7%	-0.01
ZM	-3.0%	9.6%	7.9%	-26.9%	0.12

Risk Flags Details

Symbol	High Vol	Ext. DD	Vol Collapse	Severe Dec	Ext. Dec	Poor Sharpe	Mom. Break
BYND	✓	✓	✗	✗	✓	✓	✓
FHTX	✓	✓	✗	✓	✗	✗	✓
UNH	✓	✓	✗	✗	✗	✓	✗
SNAP	✓	✓	✗	✗	✗	✓	✗
DOCU	✓	✓	✗	✗	✗	✗	✓
AMD	✓	✓	✗	✗	✗	✓	✗
AMC	✓	✓	✗	✗	✗	✓	✗
WKHS	✓	✓	✗	✗	✗	✓	✗
BLNK	✓	✓	✗	✗	✗	✓	✗
CRM	✗	✓	✗	✗	✗	✓	✗
NOW	✓	✓	✗	✗	✗	✗	✗
SBUX	✓	✓	✗	✗	✗	✗	✗
BA	✓	✓	✗	✗	✗	✗	✗
LYFT	✓	✓	✗	✗	✗	✗	✗
TWLO	✓	✓	✗	✗	✗	✗	✗
ETSY	✓	✓	✗	✗	✗	✗	✗
TSLA	✗	✓	✗	✗	✗	✓	✗
GME	✓	✓	✗	✗	✗	✗	✗
FUBO	✓	✓	✗	✗	✗	✗	✗
PLTR	✗	✓	✗	✗	✗	✓	✗
AAPL	✗	✓	✗	✗	✗	✗	✗

PG	✗	✗	✗	✗	✗	✓	✗
GM	✗	✓	✗	✗	✗	✗	✗
UBER	✓	✗	✗	✗	✗	✗	✗
ZM	✗	✓	✗	✗	✗	✗	✗
SQ	✓	✗	✗	✗	✗	✗	✗
SPCE	✗	✓	✗	✗	✗	✗	✗
FCEL	✗	✓	✗	✗	✗	✗	✗
MSFT	✗	✗	✗	✗	✗	✗	✗
JNJ	✗	✗	✗	✗	✗	✗	✗
KO	✗	✗	✗	✗	✗	✗	✗
V	✗	✗	✗	✗	✗	✗	✗
MA	✗	✗	✗	✗	✗	✗	✗
HD	✗	✗	✗	✗	✗	✗	✗
MCD	✗	✗	✗	✗	✗	✗	✗
WMT	✗	✗	✗	✗	✗	✗	✗
IBM	✗	✗	✗	✗	✗	✗	✗
XOM	✗	✗	✗	✗	✗	✗	✗
CVX	✗	✗	✗	✗	✗	✗	✗
PEP	✗	✗	✗	✗	✗	✗	✗
SHOP	✗	✗	✗	✗	✗	✗	✗
PLUG	✗	✗	✗	✗	✗	✗	✗
NVDA	✗	✗	✗	✗	✗	✗	✗
NKLA	✗	✗	✗	✗	✗	✗	✗
RIVN	✗	✗	✗	✗	✗	✗	✗

Data Summary:
- Total Assets: 45
- Data Generated: 2025-10-23 14:00:16
- 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.