Portfolio Risk Analysis Report

Report Date: October 23, 2025
Portfolio Size: 21 Assets
Analysis Period: 52 Weeks (Weekly Data)
Data Frequency: Weekly Adjusted Prices
Generated by: Automated Risk Analysis Pipeline

Risk Assessment Summary

HIGH RISK (RED): 13 Assets
MEDIUM RISK (YELLOW): 0 Assets
LOW RISK (GREEN): 8 Assets

Executive Summary

This report presents a comprehensive risk analysis of a portfolio containing 21 assets with a combined market capitalization of $3157.2 billion. Analysis is based on weekly adjusted price data covering approximately 52 weeks of trading history. **Key Findings:** • 13 assets (61.9%) are rated as HIGH RISK (RED) • 0 assets (0.0%) are rated as MEDIUM RISK (YELLOW) • Average portfolio volatility (annualized): 41.0% • Maximum drawdown observed: -65.3% **Risk Concentration:** The analysis reveals significant risk concentration in 13 assets requiring immediate attention and potential portfolio rebalancing. **Sentiment Analysis:** • 7 RED-flagged assets show negative market sentiment • Average sentiment score for flagged assets: -0.311 • News coverage indicates heightened market concern for these positions

Portfolio Overview

Sector Allocation

Sector	Assets	Market Cap ($B)	Percentage
Technology	7	1817.80	57.6%
Financial Services	2	476.22	15.1%
Consumer Discretionary	5	297.04	9.4%
Industrial	2	246.69	7.8%
Healthcare	1	218.48	6.9%
Consumer Staples	2	92.98	2.9%
Energy	2	7.99	0.3%

Risk Analysis Results

Risk Distribution:
• HIGH RISK (RED): 13 assets
• MEDIUM RISK (YELLOW): 0 assets
• LOW RISK (GREEN): 8 assets

High Risk Assets

Symbol	Sector	Risk Rating	Volatility (Annualized)	Max Drawdown	Risk Score
SNAP	Technology	RED	44.2%	-42.7%	3
AMC	Consumer Discretionary	RED	46.3%	-46.5%	3
RIVN	Consumer Discretionary	RED	55.4%	-34.8%	3
CRM	Technology	RED	30.0%	-33.4%	2
SBUX	Consumer Discretionary	RED	35.6%	-31.3%	2
BA	Industrial	RED	40.9%	-25.9%	2

SHOP	Technology	RED	60.5%	-40.1%	2
TSLA	Consumer Discretionary	RED	52.4%	-45.1%	2
NVDA	Technology	RED	46.0%	-34.7%	2
GME	Consumer Discretionary	RED	49.8%	-33.1%	2
SPCE	Industrial	RED	95.4%	-65.3%	2
BLNK	Energy	RED	75.8%	-57.2%	2
AAPL	Technology	RED	33.3%	-26.2%	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: 3
• Anomaly Rate: 14.3%
Risk Prediction Model:
• Model Accuracy: 100.0%
• Rating Changes Predicted: 0
• Assets Predicted to Deteriorate: 0
• Assets Predicted to Improve: 0

Key Machine Learning Insights

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

Critical Anomalies Detected

Symbol	Sector	Anomaly Score	Severity	Recommendation
BLNK	Energy	100.0	CRITICAL	Critical anomaly - Consider immediate po...
JNJ	Healthcare	63.2	HIGH	Significant anomaly - Conduct thorough d...
SHOP	Technology	62.8	HIGH	Significant anomaly - Conduct thorough d...
SPCE	Industrial	60.6	HIGH	Normal behavior pattern - Continue monit...

Top Risk Factors (Feature Importance)

1. Max Drawdown: 48.2% importance
2. Volatility: 28.4% importance
3. Price Change 3M: 5.8% importance
4. Volume Decline: 4.3% importance
5. Sharpe Ratio: 3.9% importance

ML Validation Results

Overall Validation Status: WARNING
Checks Passed: 3 / 4

✓ **Anomaly Detection Validation:** PASS
total_assets: 21, anomalies_detected: 3, anomaly_rate: 14.3
■ **Risk Prediction Validation:** WARNING
model_accuracy: 100.0, predictions_made: 21, rating_changes: 0
✓ **Feature Quality Validation:** PASS
features_checked: 9, nan_features: 0, total_samples: 21
✓ **Feature Importance Validation:** PASS
total_importance: 100.0, top_feature: Max Drawdown, top_importance: 48.2

Validation Warnings (1):
1. Suspiciously high accuracy: 100.0% (possible overfitting)

Sentiment Analysis

Sentiment analysis was conducted on 13 RED-flagged assets using financial news from the past 12 months. **Key Findings:**
• Average sentiment score: -0.311
• Assets with negative sentiment: 7/13
• Total news articles analyzed: 294

Sentiment Analysis Results

Symbol	Sentiment Score	Label	News Count	Trend	Key Themes
CRM	-0.418	NEGATIVE	19	IMPROVING	earnings, market_share, regulatory
SBUX	-0.365	NEGATIVE	15	DETERIORATING	earnings, market_share, regulatory
AMC	-0.363	NEGATIVE	27	STABLE	earnings, market_share, financial_health
RIVN	-0.362	NEGATIVE	28	IMPROVING	earnings, market_share, regulatory
SPCE	-0.352	NEGATIVE	28	IMPROVING	earnings, market_share, financial_health
SNAP	-0.333	NEGATIVE	27	STABLE	earnings, market_share, regulatory
SHOP	-0.316	NEGATIVE	17	IMPROVING	earnings, regulatory, market_share
BA	-0.294	NEUTRAL	26	IMPROVING	market_share, earnings, regulatory
NVDA	-0.292	NEUTRAL	26	STABLE	market_share, earnings, regulatory
AAPL	-0.286	NEUTRAL	19	IMPROVING	earnings, market_share, regulatory
GME	-0.258	NEUTRAL	16	STABLE	earnings, market_share, growth
BLNK	-0.257	NEUTRAL	26	STABLE	market_share, earnings, regulatory
TSLA	-0.143	NEUTRAL	20	DETERIORATING	earnings, regulatory, market_share

Detailed Asset Analysis

Asset: SNAP

Sector: Technology
Current Price: $7.77
Market Cap: $7.43B
Risk Rating: RED
Risk Metrics:
• Volatility: 44.2%
• Maximum Drawdown: -42.7%
• Beta: 0.84
• 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: -0.333 (NEGATIVE)
• News Articles: 27
• Trend: STABLE

Asset: AMC

Sector: Consumer Discretionary
Current Price: $2.75
Market Cap: $3.55B
Risk Rating: RED
Risk Metrics:
• Volatility: 46.3%
• Maximum Drawdown: -46.5%
• Beta: 0.39
• Sharpe Ratio: -0.93
• RSI: 29.9
Performance:
• 1-Month Return: -4.8%
• 3-Month Return: -15.4%
• 6-Month Return: 1.5%
Risk Flags:
• High Volatility, Extreme Drawdown, Poor Risk Return
Market Sentiment:
• Sentiment Score: -0.363 (NEGATIVE)
• News Articles: 27
• Trend: STABLE

Asset: RIVN

Sector: Consumer Discretionary
Current Price: $12.92
Market Cap: $5.96B
Risk Rating: RED
Risk Metrics:
• Volatility: 55.4%
• Maximum Drawdown: -34.8%
• Beta: -0.19
• Sharpe Ratio: 0.72
• RSI: 46.4

Performance:
• 1-Month Return: -17.1%
• 3-Month Return: -7.8%
• 6-Month Return: 2.4%
Risk Flags:
• High Volatility, Extreme Drawdown, Severe Decline
Market Sentiment:
• Sentiment Score: -0.362 (NEGATIVE)
• News Articles: 28
• Trend: IMPROVING

Asset: CRM

Sector: Technology
Current Price: $256.64
Market Cap: $273.42B
Risk Rating: RED
Risk Metrics:
• Volatility: 30.0%
• Maximum Drawdown: -33.4%
• Beta: 0.57
• Sharpe Ratio: -0.73
• RSI: 47.1
Performance:
• 1-Month Return: 5.4%
• 3-Month Return: -4.5%
• 6-Month Return: -3.9%
Risk Flags:
• Extreme Drawdown, Poor Risk Return
Market Sentiment:
• Sentiment Score: -0.418 (NEGATIVE)
• News Articles: 19
• Trend: IMPROVING

Asset: SBUX

Sector: Consumer Discretionary
Current Price: $85.50
Market Cap: $22.28B
Risk Rating: RED
Risk Metrics:
• Volatility: 35.6%
• Maximum Drawdown: -31.3%
• Beta: 0.18
• Sharpe Ratio: -0.24
• RSI: 41.4
Performance:
• 1-Month Return: 2.5%
• 3-Month Return: -8.8%
• 6-Month Return: 3.4%
Risk Flags:
• High Volatility, Extreme Drawdown
Market Sentiment:
• Sentiment Score: -0.365 (NEGATIVE)
• News Articles: 15
• 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 13 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 7 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 16:43:17
• Analysis Period: 12 months
• Total Assets Analyzed: 21
• 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_164317.csv
Risk Analysis CSV: risk_analysis_20251023_164317.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	-4.8%	-15.4%	1.5%	44.1%	-0.93
BA	-2.1%	-7.1%	21.7%	-1.2%	1.30
BLNK	17.8%	59.8%	125.6%	52.0%	0.56
CRM	5.4%	-4.5%	-3.9%	0.1%	-0.73
GME	-14.9%	-3.6%	-18.1%	-5.2%	-0.13
JNJ	7.4%	15.5%	26.8%	-2.3%	1.63
MSFT	1.8%	1.5%	33.3%	-15.9%	1.14
NVDA	1.2%	3.9%	62.4%	-6.7%	0.74
PG	-0.2%	-3.9%	-4.8%	-2.5%	-0.59
RIVN	-17.1%	-7.8%	2.4%	-26.4%	0.72
SBUX	2.5%	-8.8%	3.4%	-0.1%	-0.24
SHOP	15.5%	30.2%	66.8%	4.1%	0.97
SNAP	-6.0%	-20.5%	-9.0%	-3.6%	-0.56
SPCE	8.8%	-10.1%	30.5%	41.3%	-0.25
SQ	17.4%	12.2%	12.3%	-29.2%	1.11
TSLA	-0.3%	38.9%	54.1%	-4.6%	0.86
UBER	-6.3%	1.0%	18.6%	-22.2%	0.80
V	2.4%	-3.1%	3.4%	-10.9%	0.59
WMT	3.9%	10.2%	13.2%	-12.3%	1.08
XOM	-2.1%	4.9%	7.6%	-18.7%	-0.01

Risk Flags Details

Symbol	High Vol	Ext. DD	Vol Collapse	Severe Dec	Ext. Dec	Poor Sharpe	Mom. Break
SNAP	✓	✓	✗	✗	✗	✓	✗
AMC	✓	✓	✗	✗	✗	✓	✗
RIVN	✓	✓	✗	✓	✗	✗	✗
CRM	✗	✓	✗	✗	✗	✓	✗

SBUX	✓	✓	✗	✗	✗	✗	✗
BA	✓	✓	✗	✗	✗	✗	✗
SHOP	✓	✓	✗	✗	✗	✗	✗
TSLA	✓	✓	✗	✗	✗	✗	✗
NVDA	✓	✓	✗	✗	✗	✗	✗
GME	✓	✓	✗	✗	✗	✗	✗
SPCE	✓	✓	✗	✗	✗	✗	✗
BLNK	✓	✓	✗	✗	✗	✗	✗
AAPL	✗	✓	✗	✗	✗	✗	✗
PG	✗	✗	✗	✗	✗	✓	✗
UBER	✓	✗	✗	✗	✗	✗	✗
MSFT	✗	✗	✗	✗	✗	✗	✗
JNJ	✗	✗	✗	✗	✗	✗	✗
V	✗	✗	✗	✗	✗	✗	✗
WMT	✗	✗	✗	✗	✗	✗	✗
XOM	✗	✗	✗	✗	✗	✗	✗
SQ	✗	✗	✗	✗	✗	✗	✗

Data Summary:
• Total Assets: 21
• Data Generated: 2025-10-23 16:43:18
• 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.