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): 14 Assets
MEDIUM RISK (YELLOW): 0 Assets
LOW RISK (GREEN): 7 Assets

Executive Summary

This report presents a comprehensive risk analysis of a portfolio containing 21 assets with a combined market capitalization of $12250.4 billion. Analysis is based on weekly adjusted price data covering approximately 52 weeks of trading history. **Key Findings:** • 14 assets (66.7%) are rated as HIGH RISK (RED) • 0 assets (0.0%) are rated as MEDIUM RISK (YELLOW) • Average portfolio volatility (annualized): 36.0% • Maximum drawdown observed: -46.0% **Risk Concentration:** The analysis reveals significant risk concentration in 14 assets requiring immediate attention and potential portfolio rebalancing. **Sentiment Analysis:** • 5 RED-flagged assets show negative market sentiment • Average sentiment score for flagged assets: -0.286 • News coverage indicates heightened market concern for these positions

Portfolio Overview

Sector Allocation

Sector	Assets	Market Cap ($B)	Percentage
Technology	7	8821.47	72.0%
Consumer Staples	2	1210.43	9.9%
Financial Services	2	724.22	5.9%
Energy	2	529.87	4.3%
Healthcare	1	464.66	3.8%
Consumer Discretionary	5	309.97	2.5%
Industrial	2	189.78	1.5%

Risk Analysis Results

Risk Distribution:
• HIGH RISK (RED): 14 assets
• MEDIUM RISK (YELLOW): 0 assets
• LOW RISK (GREEN): 7 assets

High Risk Assets

Symbol	Sector	Risk Rating	Volatility (Annualized)	Max Drawdown	Risk Score
SNAP	Technology	RED	44.2%	-42.7%	3
NVDA	Technology	RED	36.2%	-38.7%	3
AMC	Consumer Discretionary	RED	36.9%	-34.1%	3
RIVN	Consumer Discretionary	RED	44.0%	-30.5%	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
SQ	Financial Services	RED	42.2%	-31.4%	2
TSLA	Consumer Discretionary	RED	45.0%	-46.0%	2
GME	Consumer Discretionary	RED	46.1%	-20.2%	2
SPCE	Industrial	RED	38.2%	-32.4%	2
BLNK	Energy	RED	58.8%	-31.9%	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: 2
• Anomaly Rate: 14.3%
Risk Prediction Model:
• Model Accuracy: 85.7%
• Rating Changes Predicted: 1
• Assets Predicted to Deteriorate: 0
• Assets Predicted to Improve: 1

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
SHOP	Technology	100.0	CRITICAL	Critical anomaly - Consider immediate po...
SPCE	Industrial	65.9	HIGH	Significant anomaly - Conduct thorough d...
JNJ	Healthcare	63.8	HIGH	Significant anomaly - Conduct thorough d...

Predicted Risk Rating Changes

Symbol	Current Rating	Predicted Rating	Confidence	Trend
GME	RED	GREEN	57.0%	IMPROVING

Top Risk Factors (Feature Importance)

1. Max Drawdown: 43.2% importance
2. Volatility: 31.7% importance
3. Price Change 3M: 8.7% importance
4. Rsi: 4.8% importance
5. Beta: 3.6% importance

ML Validation Results

Overall Validation Status: PASS
Checks Passed: 4 / 4

✓ **Anomaly Detection Validation:** PASS
total_assets: 21, anomalies_detected: 3, anomaly_rate: 14.3
✓ **Risk Prediction Validation:** PASS
model_accuracy: 85.7, predictions_made: 21, rating_changes: 1
✓ **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: 43.2

Sentiment Analysis

Sentiment analysis was conducted on 14 RED-flagged assets using financial news from the past 12 months. **Key Findings:**
• Average sentiment score: -0.286
• Assets with negative sentiment: 5/14
• Total news articles analyzed: 287

Sentiment Analysis Results

Symbol	Sentiment Score	Label	News Count	Trend	Key Themes
AAPL	-0.479	NEGATIVE	22	IMPROVING	market_share, earnings, financial_health
BLNK	-0.421	NEGATIVE	17	IMPROVING	earnings, market_share, financial_health
TSLA	-0.403	NEGATIVE	18	IMPROVING	earnings, market_share, operations
BA	-0.311	NEGATIVE	15	IMPROVING	market_share, operations, earnings
SQ	-0.308	NEGATIVE	19	IMPROVING	earnings, regulatory, operations
AMC	-0.273	NEUTRAL	30	IMPROVING	earnings, market_share, financial_health
GME	-0.260	NEUTRAL	16	DETERIORATING	market_share, earnings, regulatory
CRM	-0.252	NEUTRAL	20	STABLE	earnings, regulatory, market_share
NVDA	-0.245	NEUTRAL	27	IMPROVING	earnings, regulatory, market_share
SBUX	-0.238	NEUTRAL	23	STABLE	earnings, market_share, regulatory
SPCE	-0.225	NEUTRAL	30	DETERIORATING	earnings, market_share, regulatory
RIVN	-0.221	NEUTRAL	15	STABLE	earnings, regulatory, market_share
SHOP	-0.197	NEUTRAL	16	DETERIORATING	earnings, regulatory, market_share
SNAP	-0.172	NEUTRAL	19	IMPROVING	earnings, market_share, regulatory

Detailed Asset Analysis

Asset: SNAP

Sector: Technology
Current Price: $7.77
Market Cap: $13.13B
Risk Rating: RED
Risk Metrics:
• Volatility: 44.2%
• Maximum Drawdown: -42.7%
• Beta: 1.16
• 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: -0.172 (NEUTRAL)
• News Articles: 19
• Trend: IMPROVING

Asset: NVDA

Sector: Technology
Current Price: $250.88
Market Cap: $455.29B
Risk Rating: RED
Risk Metrics:
• Volatility: 36.2%
• Maximum Drawdown: -38.7%
• Beta: 0.17
• Sharpe Ratio: -1.41
• RSI: 41.4
Performance:
• 1-Month Return: -9.4%
• 3-Month Return: -6.7%
• 6-Month Return: -3.7%
Risk Flags:
• High Volatility, Extreme Drawdown, Poor Risk Return
Market Sentiment:
• Sentiment Score: -0.245 (NEUTRAL)
• News Articles: 27
• Trend: IMPROVING

Asset: AMC

Sector: Consumer Discretionary
Current Price: $197.17
Market Cap: $83.25B

Risk Rating: RED
Risk Metrics:
• Volatility: 36.9%
• Maximum Drawdown: -34.1%
• Beta: 0.15
• Sharpe Ratio: -0.93
• RSI: 40.5
Performance:
• 1-Month Return: -1.8%
• 3-Month Return: -12.5%
• 6-Month Return: -17.6%
Risk Flags:
• High Volatility, Extreme Drawdown, Poor Risk Return
Market Sentiment:
• Sentiment Score: -0.273 (NEUTRAL)
• News Articles: 30
• Trend: IMPROVING

Asset: RIVN

Sector: Consumer Discretionary
Current Price: $53.25
Market Cap: $27.11B
Risk Rating: RED
Risk Metrics:
• Volatility: 44.0%
• Maximum Drawdown: -30.5%
• Beta: -0.07
• Sharpe Ratio: -0.37
• RSI: 37.2
Performance:
• 1-Month Return: -12.8%
• 3-Month Return: -15.0%
• 6-Month Return: -6.6%
Risk Flags:
• High Volatility, Extreme Drawdown, Momentum Breakdown
Market Sentiment:
• Sentiment Score: -0.221 (NEUTRAL)
• News Articles: 15
• Trend: STABLE

Asset: CRM

Sector: Technology
Current Price: $256.64
Market Cap: $244.32B
Risk Rating: RED
Risk Metrics:
• Volatility: 30.0%
• Maximum Drawdown: -33.4%
• Beta: -0.33
• 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: -0.252 (NEUTRAL)
• News Articles: 20
• Trend: STABLE

Recommendations

Based on the comprehensive risk analysis, the following recommendations are provided:
Immediate Actions (RED-flagged assets):
1. Consider reducing position sizes for 14 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 5 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 17:10:07
• 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_171007.csv
Risk Analysis CSV: risk_analysis_20251023_171007.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	-1.8%	-12.5%	-17.6%	-21.4%	-0.93
BA	-2.1%	-7.1%	21.7%	-1.2%	1.30
BLNK	-4.2%	-1.1%	40.0%	-19.2%	1.61
CRM	5.4%	-4.5%	-3.9%	0.1%	-0.73
GME	8.2%	-1.0%	53.2%	-18.9%	2.32
JNJ	7.4%	15.5%	26.8%	-2.3%	1.63
MSFT	1.8%	1.5%	33.3%	-15.9%	1.14
NVDA	-9.4%	-6.7%	-3.7%	26.6%	-1.41
PG	-0.2%	-3.9%	-4.8%	-2.5%	-0.59
RIVN	-12.8%	-15.0%	-6.6%	20.4%	-0.37
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	10.3%	19.5%	70.9%	12.0%	1.23
SQ	-2.5%	-8.8%	-1.1%	4.1%	-0.12
TSLA	7.3%	-9.1%	8.3%	-3.0%	-0.10
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	✓	✓	✗	✗	✗	✓	✗
NVDA	✓	✓	✗	✗	✗	✓	✗
AMC	✓	✓	✗	✗	✗	✓	✗
RIVN	✓	✓	✗	✗	✗	✗	✓

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

Data Summary:
- Total Assets: 21
- Data Generated: 2025-10-23 17:10:07
- 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.