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): 12 Assets
MEDIUM RISK (YELLOW): 4 Assets
LOW RISK (GREEN): 5 Assets

Executive Summary

This report presents a comprehensive risk analysis of a portfolio containing 21 assets with a combined market capitalization of $12735.7 billion. Analysis is based on weekly adjusted price data covering approximately 52 weeks of trading history. **Key Findings:** • 12 assets (57.1%) are rated as HIGH RISK (RED) • 4 assets (19.0%) are rated as MEDIUM RISK (YELLOW) • Average portfolio volatility (annualized): 36.5% • Maximum drawdown observed: -63.7% **Risk Concentration:** The analysis reveals significant risk concentration in 16 assets requiring immediate attention and potential portfolio rebalancing. **Sentiment Analysis:** • 6 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	7	8659.79	68.0%
Consumer Staples	2	1210.43	9.5%
Financial Services	2	747.22	5.9%
Energy	2	632.86	5.0%
Consumer Discretionary	5	550.76	4.3%
Industrial	2	470.01	3.7%
Healthcare	1	464.66	3.6%

Risk Analysis Results

Risk Distribution:
• HIGH RISK (RED): 12 assets
• MEDIUM RISK (YELLOW): 4 assets
• LOW RISK (GREEN): 5 assets

High Risk Assets

Symbol	Sector	Risk Rating	Volatility (Annualized)	Max Drawdown	Risk Score
SPCE	Industrial	RED	45.6%	-49.1%	4
SNAP	Technology	RED	44.2%	-42.7%	3
BLNK	Energy	RED	44.9%	-37.9%	3
CRM	Technology	YELLOW	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
NVDA	Technology	RED	38.0%	-29.2%	2
GME	Consumer Discretionary	RED	57.5%	-29.6%	2
AMC	Consumer Discretionary	RED	54.7%	-63.7%	2
RIVN	Consumer Discretionary	RED	51.3%	-56.6%	2
AAPL	Technology	YELLOW	33.3%	-26.2%	1
PG	Consumer Staples	YELLOW	16.9%	-14.9%	1
UBER	Technology	RED	36.5%	-18.6%	1
SQ	Financial Services	YELLOW	22.0%	-20.6%	1
TSLA	Consumer Discretionary	RED	45.2%	-19.1%	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: 2
• High Risk Anomalies: 4
• 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

• 2 assets show critical anomalous behavior requiring immediate review
• Anomaly detection identified 3 assets with unusual patterns
• Key risk drivers: Volatility, Max Drawdown, Sharpe Ratio

Critical Anomalies Detected

Symbol	Sector	Anomaly Score	Severity	Recommendation
AMC	Consumer Discretionary	100.0	CRITICAL	Critical anomaly - Consider immediate po...
SHOP	Technology	87.1	CRITICAL	Critical anomaly - Consider immediate po...
JNJ	Healthcare	79.4	HIGH	Significant anomaly - Conduct thorough d...
SPCE	Industrial	79.2	HIGH	Normal behavior pattern - Continue monit...
GME	Consumer Discretionary	74.1	HIGH	Normal behavior pattern - Continue monit...
RIVN	Consumer Discretionary	73.0	HIGH	Normal behavior pattern - Continue monit...

Top Risk Factors (Feature Importance)

1. Volatility: 28.4% importance
2. Max Drawdown: 24.1% importance
3. Sharpe Ratio: 10.7% importance
4. Volume Decline: 9.0% importance
5. Rsi: 7.2% 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: Volatility, top_importance: 28.4

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

Sentiment Analysis

Sentiment analysis was conducted on 12 RED-flagged assets using financial news from the past 12 months. **Key Findings:**
• Average sentiment score: -0.293
• Assets with negative sentiment: 6/12
• Total news articles analyzed: 241

Sentiment Analysis Results

Symbol	Sentiment Score	Label	News Count	Trend	Key Themes
SHOP	-0.423	NEGATIVE	16	IMPROVING	market_share, earnings, financial_health
SBUX	-0.373	NEGATIVE	30	STABLE	earnings, market_share, operations
RIVN	-0.351	NEGATIVE	15	IMPROVING	market_share, earnings, financial_health
BA	-0.348	NEGATIVE	16	STABLE	earnings, regulatory, market_share
GME	-0.330	NEGATIVE	24	DETERIORATING	earnings, market_share, regulatory
TSLA	-0.320	NEGATIVE	21	STABLE	earnings, market_share, regulatory
AMC	-0.297	NEUTRAL	26	IMPROVING	earnings, market_share, regulatory
UBER	-0.265	NEUTRAL	24	IMPROVING	earnings, operations, regulatory
BLNK	-0.239	NEUTRAL	17	IMPROVING	market_share, earnings, financial_health
SNAP	-0.199	NEUTRAL	16	IMPROVING	earnings, market_share, financial_health
SPCE	-0.196	NEUTRAL	19	DETERIORATING	earnings, market_share, regulatory
NVDA	-0.174	NEUTRAL	17	DETERIORATING	earnings, regulatory, market_share

Detailed Asset Analysis

Asset: SPCE

Sector: Industrial
Current Price: $166.50
Market Cap: $306.23B
Risk Rating: RED
Risk Metrics:
• Volatility: 45.6%
• Maximum Drawdown: -49.1%
• Beta: 0.63
• Sharpe Ratio: -0.22
• RSI: 23.7
Performance:
• 1-Month Return: -10.6%
• 3-Month Return: -29.1%
• 6-Month Return: -47.6%
Risk Flags:
• High Volatility, Extreme Drawdown, Extended Decline, Momentum Breakdown
Market Sentiment:
• Sentiment Score: -0.196 (NEUTRAL)
• News Articles: 19
• Trend: DETERIORATING

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: 0.80
• 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: -0.199 (NEUTRAL)
• News Articles: 16
• Trend: IMPROVING

Asset: BLNK

Sector: Energy
Current Price: $96.42
Market Cap: $143.83B

Risk Rating: RED
Risk Metrics:
• Volatility: 44.9%
• Maximum Drawdown: -37.9%
• Beta: 0.48
• Sharpe Ratio: -0.29
• RSI: 41.3
Performance:
• 1-Month Return: -12.1%
• 3-Month Return: -21.2%
• 6-Month Return: 5.8%
Risk Flags:
• High Volatility, Extreme Drawdown, Momentum Breakdown
Market Sentiment:
• Sentiment Score: -0.239 (NEUTRAL)
• News Articles: 17
• Trend: IMPROVING

Asset: CRM

Sector: Technology
Current Price: $256.64
Market Cap: $244.32B
Risk Rating: YELLOW
Risk Metrics:
• Volatility: 30.0%
• Maximum Drawdown: -33.4%
• Beta: -0.79
• 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

Asset: SBUX

Sector: Consumer Discretionary
Current Price: $85.50
Market Cap: $97.19B
Risk Rating: RED
Risk Metrics:
• Volatility: 35.6%
• Maximum Drawdown: -31.3%
• Beta: -1.07
• 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: -0.373 (NEGATIVE)

• News Articles: 30
• 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 12 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 4 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 6 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 17:57:15
• 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_175715.csv
Risk Analysis CSV: risk_analysis_20251023_175715.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	42.9%	-19.8%	-30.4%	-5.0%	-0.35
BA	-2.1%	-7.1%	21.7%	-1.2%	1.30
BLNK	-12.1%	-21.2%	5.8%	-8.1%	-0.29
CRM	5.4%	-4.5%	-3.9%	0.1%	-0.73
GME	-8.3%	29.4%	-0.2%	15.9%	0.51
JNJ	7.4%	15.5%	26.8%	-2.3%	1.63
MSFT	1.8%	1.5%	33.3%	-15.9%	1.14
NVDA	0.2%	-6.8%	11.2%	0.2%	0.38
PG	-0.2%	-3.9%	-4.8%	-2.5%	-0.59
RIVN	-8.8%	2.3%	-43.3%	18.2%	-0.46
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	-10.6%	-29.1%	-47.6%	13.0%	-0.22
SQ	1.1%	3.6%	5.6%	15.4%	-0.43
TSLA	-4.2%	4.8%	11.6%	14.2%	1.83
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
SPCE	✓	✓	✗	✗	✓	✗	✓
SNAP	✓	✓	✗	✗	✗	✓	✗
BLNK	✓	✓	✗	✗	✗	✗	✓
CRM	✗	✓	✗	✗	✗	✓	✗

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

Data Summary:
- Total Assets: 21
- Data Generated: 2025-10-23 17:57:15
- 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.