Portfolio Risk Analysis Report

Report Date: November 03, 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 $13160.5 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): 36.7% • Maximum drawdown observed: -56.1% **Risk Concentration:** The analysis reveals significant risk concentration in 16 assets requiring immediate attention and potential portfolio rebalancing. **Sentiment Analysis:** • 8 RED-flagged assets show negative market sentiment • Average sentiment score for flagged assets: -0.305 • News coverage indicates heightened market concern for these positions

Portfolio Overview

Sector Allocation

Sector	Assets	Market Cap ($B)	Percentage
Technology	7	8868.95	67.4%
Consumer Staples	2	1158.07	8.8%
Consumer Discretionary	5	906.38	6.9%
Financial Services	2	866.24	6.6%
Energy	2	583.90	4.4%
Healthcare	1	455.04	3.5%
Industrial	2	321.92	2.4%

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
RIVN	Consumer Discretionary	RED	43.0%	-46.6%	4
BLNK	Energy	RED	44.2%	-31.6%	4
SBUX	Consumer Discretionary	RED	35.8%	-31.3%	3
SNAP	Technology	RED	43.6%	-42.7%	3
GME	Consumer Discretionary	RED	41.6%	-54.2%	3
CRM	Technology	YELLOW	29.4%	-33.4%	2

BA	Industrial	RED	41.9%	-25.9%	2
SHOP	Technology	RED	61.1%	-40.1%	2
SQ	Financial Services	YELLOW	31.3%	-31.8%	2
TSLA	Consumer Discretionary	RED	44.3%	-33.9%	2
NVDA	Technology	RED	47.0%	-56.1%	2
SPCE	Industrial	RED	50.1%	-27.6%	2
AAPL	Technology	YELLOW	33.5%	-26.2%	1
PG	Consumer Staples	YELLOW	16.5%	-14.9%	1
UBER	Technology	RED	36.5%	-18.6%	1
AMC	Consumer Discretionary	RED	60.6%	-17.6%	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: 2
• Anomaly Rate: 14.3%
Risk Prediction Model:
• Model Accuracy: 57.1%
• Rating Changes Predicted: 3
• Assets Predicted to Deteriorate: 3
• Assets Predicted to Improve: 0

Key Machine Learning Insights

• 2 assets show critical anomalous behavior requiring immediate review
• 3 assets predicted to deteriorate in risk rating
• 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
SPCE	Industrial	100.0	CRITICAL	Critical anomaly - Consider immediate po...
AMC	Consumer Discretionary	91.4	CRITICAL	Critical anomaly - Consider immediate po...
NVDA	Technology	75.4	HIGH	Significant anomaly - Conduct thorough d...
SHOP	Technology	63.5	HIGH	Normal behavior pattern - Continue monit...

Predicted Risk Rating Changes

Symbol	Current Rating	Predicted Rating	Confidence	Trend

SQ	YELLOW	RED	56.0%	DETERIORATING
WMT	GREEN	YELLOW	48.0%	DETERIORATING
MSFT	GREEN	YELLOW	43.0%	DETERIORATING

Top Risk Factors (Feature Importance)

1. Volatility: 33.1% importance
2. Max Drawdown: 26.2% importance
3. Sharpe Ratio: 8.3% importance
4. Price Change 1M: 8.2% importance
5. Volume Decline: 6.6% 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: 57.1, predictions_made: 21, rating_changes: 3
✓ **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: 33.1

Sentiment Analysis

Sentiment analysis was conducted on 12 RED-flagged assets using financial news from the past 12 months. **Key Findings:**
• Average sentiment score: -0.305
• Assets with negative sentiment: 8/12
• Total news articles analyzed: 263

Sentiment Analysis Results

Symbol	Sentiment Score	Label	News Count	Trend	Key Themes
SPCE	-0.359	NEGATIVE	25	STABLE	earnings, market_share, management
BLNK	-0.359	NEGATIVE	23	IMPROVING	earnings, market_share, regulatory
SHOP	-0.357	NEGATIVE	20	DETERIORATING	earnings, market_share, financial_health
GME	-0.342	NEGATIVE	24	IMPROVING	earnings, market_share, financial_health
UBER	-0.320	NEGATIVE	22	IMPROVING	earnings, market_share, operations
NVDA	-0.316	NEGATIVE	19	IMPROVING	earnings, market_share, financial_health
BA	-0.309	NEGATIVE	27	IMPROVING	market_share, earnings, financial_health
RIVN	-0.303	NEGATIVE	24	IMPROVING	earnings, market_share, regulatory

SBUX	-0.293	NEUTRAL	18	DETERIORATING	earnings, market_share, management
AMC	-0.274	NEUTRAL	18	DETERIORATING	market_share, regulatory, earnings
TSLA	-0.236	NEUTRAL	19	IMPROVING	earnings, market_share, management
SNAP	-0.190	NEUTRAL	24	IMPROVING	earnings, market_share, regulatory

Detailed Asset Analysis

Asset: RIVN

Sector: Consumer Discretionary
Current Price: $135.02
Market Cap: $251.07B
Risk Rating: RED
Risk Metrics:
• Volatility: 43.0%
• Maximum Drawdown: -46.6%
• Beta: -0.74
• Sharpe Ratio: -0.91
• RSI: 25.3
Performance:
• 1-Month Return: -11.3%
• 3-Month Return: -24.3%
• 6-Month Return: -38.1%
Risk Flags:
• High Volatility, Extreme Drawdown, Poor Risk Return, Momentum Breakdown
Market Sentiment:
• Sentiment Score: -0.303 (NEGATIVE)
• News Articles: 24
• Trend: IMPROVING

Asset: BLNK

Sector: Energy
Current Price: $116.83
Market Cap: $96.35B
Risk Rating: RED
Risk Metrics:
• Volatility: 44.2%
• Maximum Drawdown: -31.6%
• Beta: -1.06
• Sharpe Ratio: -0.07
• RSI: 43.3
Performance:
• 1-Month Return: -22.2%
• 3-Month Return: -12.6%
• 6-Month Return: -29.5%
Risk Flags:
• High Volatility, Extreme Drawdown, Severe Decline, Momentum Breakdown
Market Sentiment:
• Sentiment Score: -0.359 (NEGATIVE)
• News Articles: 23
• Trend: IMPROVING

Asset: SBUX

Sector: Consumer Discretionary
Current Price: $80.87
Market Cap: $91.94B
Risk Rating: RED
Risk Metrics:
• Volatility: 35.8%
• Maximum Drawdown: -31.3%
• Beta: -0.22
• Sharpe Ratio: -0.52
• RSI: 37.1
Performance:
• 1-Month Return: -6.4%
• 3-Month Return: -6.3%
• 6-Month Return: -3.2%
Risk Flags:
• High Volatility, Extreme Drawdown, Poor Risk Return
Market Sentiment:
• Sentiment Score: -0.293 (NEUTRAL)
• News Articles: 18
• Trend: DETERIORATING

Asset: SNAP

Sector: Technology
Current Price: $7.80
Market Cap: $13.18B
Risk Rating: RED
Risk Metrics:
• Volatility: 43.6%
• Maximum Drawdown: -42.7%
• Beta: 0.05
• Sharpe Ratio: -0.75
• RSI: 32.0
Performance:
• 1-Month Return: -8.7%
• 3-Month Return: -13.8%
• 6-Month Return: -7.7%
Risk Flags:
• High Volatility, Extreme Drawdown, Poor Risk Return
Market Sentiment:
• Sentiment Score: -0.190 (NEUTRAL)
• News Articles: 24
• Trend: IMPROVING

Asset: GME

Sector: Consumer Discretionary
Current Price: $123.80
Market Cap: $244.54B
Risk Rating: RED
Risk Metrics:
• Volatility: 41.6%
• Maximum Drawdown: -54.2%
• Beta: -0.65
• Sharpe Ratio: -1.34
• RSI: 34.3

Performance:
• 1-Month Return: 10.6%
• 3-Month Return: -18.7%
• 6-Month Return: -24.6%
Risk Flags:
• High Volatility, Extreme Drawdown, Poor Risk Return
Market Sentiment:
• Sentiment Score: -0.342 (NEGATIVE)
• News Articles: 24
• 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 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 8 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: 2025-11-03 03:09:57
• 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_20251103_030957.csv
Risk Analysis CSV: risk_analysis_20251103_030957.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	4.8%	33.7%	32.0%	-5.7%	0.64
AMC	-7.9%	19.2%	68.7%	-17.0%	2.50
BA	-7.1%	-9.4%	8.4%	9.2%	0.93
BLNK	-22.2%	-12.6%	-29.5%	12.1%	-0.07
CRM	8.3%	4.0%	-5.0%	-0.6%	-0.88
GME	10.6%	-18.7%	-24.6%	-22.0%	-1.34
JNJ	0.1%	13.7%	22.9%	0.4%	1.43
MSFT	0.1%	-1.0%	19.4%	0.6%	1.08
NVDA	35.1%	33.6%	-28.0%	-17.2%	-0.35
PG	-0.6%	0.5%	-5.0%	7.0%	-0.89
RIVN	-11.3%	-24.3%	-38.1%	9.0%	-0.91
SBUX	-6.4%	-6.3%	-3.2%	11.6%	-0.52
SHOP	7.9%	46.6%	75.2%	14.6%	1.11
SNAP	-8.7%	-13.8%	-7.7%	-36.9%	-0.75
SPCE	38.6%	86.1%	116.2%	2.0%	1.76
SQ	-9.4%	-30.8%	-3.9%	-16.8%	1.55
TSLA	30.1%	15.5%	20.7%	15.2%	0.00
UBER	-0.1%	11.0%	14.5%	-11.3%	1.00
V	-2.6%	0.6%	-1.6%	-3.5%	0.51
WMT	-0.9%	3.0%	3.0%	-5.7%	0.56
XOM	1.0%	5.3%	9.7%	-14.7%	-0.11

Risk Flags Details

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

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

Data Summary:
• Total Assets: 21
• Data Generated: 2025-11-03 03:09:57
• 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.