Report: Portfolio Strategy Resilience Under Simulated Market Stress Conditions.

Date: October 18, 2025

Subject: Analysis of Portfolio Strategy Performance in Simulated Market Crisis Scenarios

1. Executive Summary

This report presents the findings from a quantitative analysis designed to stress-test six distinct investment portfolio strategies against severe market downturns. This simulation modeled a baseline scenario and three crisis scenarios: a sudden **Market Crash,** a prolonged **Recession**, and a **Correlation Breakdown** where traditional diversification fails.

The analysis conclusively demonstrates that the '**Safe Haven' strategy** (60% Bonds, 30% Gold, 10% Stocks) is exceptionally resilient, preserving capital and generating positive risk-adjusted returns across all crisis scenarios. Conversely, strategies with high exposure to volatile assets, such as the '**Aggressive'** and '**Crypto-Focused**' portfolios, incurred catastrophic losses, with drawdowns reaching as high as over 100%. The key takeaway is the critical importance of defensive asset allocation in mitigating portfolio risk during periods of market instability.

2. Introduction

In an increasingly volatile economic landscape, understanding portfolio vulnerability is paramount to effective risk management. The objective of this project was to move beyond traditional forecasting and simulate the impact of realistic crisis events on portfolio performance.

The methodology involved creating synthetic return data for four major asset classes (Stocks, Bonds, Gold, Crypto) over a two-year period. Six predefined portfolio strategies ('Equal Weight', 'Conservative', 'Aggressive', 'Balanced', 'Safe Haven', and 'Crypto-Focused') were then subjected to four distinct economic scenarios to measure their resilience, risk-adjusted returns (Sharpe Ratio), and maximum potential losses (Maximum Drawdown).

3. Analysis and Findings

The simulation yielded clear insights into how different asset allocation models perform under coercion. The performance of each strategy was evaluated across the four scenarios.

Scenario Definitions:

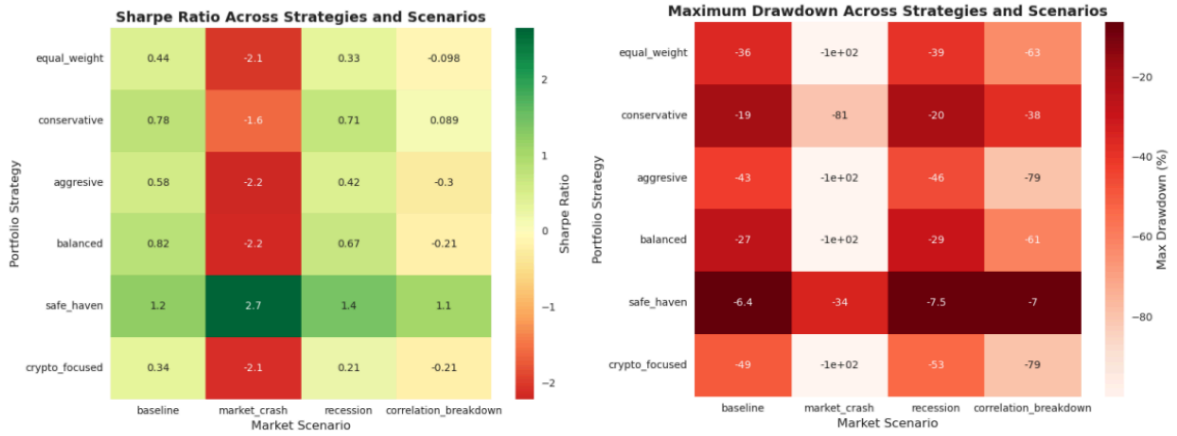
- **Baseline:** Normal market conditions with standard asset correlations and returns.
- **Market Crash:** A sudden, sharp decline in risky assets, mimicking events like the 2008 financial crisis.
- **Recession:** A prolonged period of negative growth and gradually declining asset values.
- **Correlation Breakdown:** A severe crisis where assets that are normally uncorrelated fall in tandem, rendering diversification ineffective.

Visualizations: Asset Performance Across Scenarios

The chart below illustrates the cumulative returns of the four core assets across each of the four simulated scenarios. The “Market Crash” and “Correlation Breakdown” scenarios show the most extreme impacts, particularly on ‘Stocks’ and ‘Crypto’.

Key Findings:

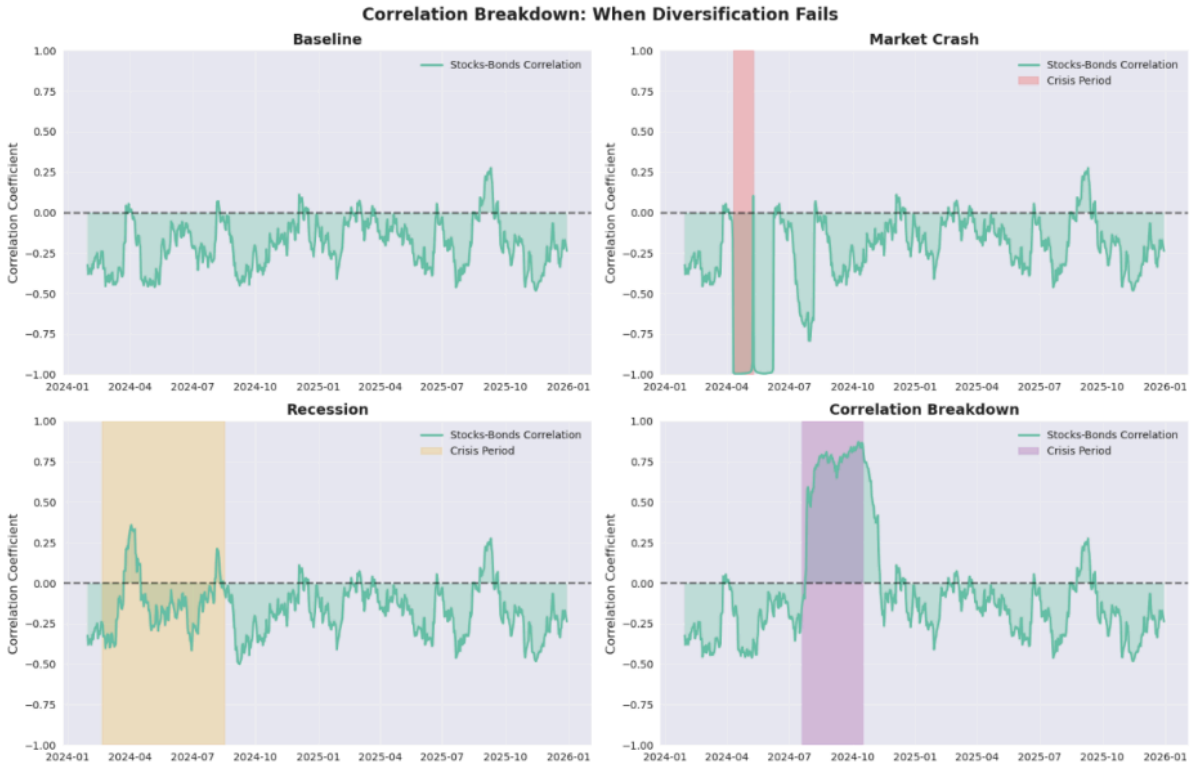
- **Dominance of the 'Safe Haven' Strategy:** In every crisis scenario, the 'Safe Haven' portfolio demonstrated superior performance. The following heatmaps for Sharpe Ratio (risk-adjusted return) and Maximum Drawdown (peak-to-through loss) clearly illustrates its resilience.
    - **Market Crash:** It was the only strategy to achieve a positive Sharpe Ratio (2.68) and limit its maximum drawdown to -33.9%.
    - **Recession & Correlation Breakdown:** It consistently delivered the highest Sharpe Ratios (1.42 and 1.08 respectively) and the lowest drawdowns (-7.5% and -7.0%).



- **Extreme Vulnerability of Aggressive Strategies:** The 'Aggressive' and 'Crypto-Focused' strategies proved extremely fragile.
    - In the Market Crash scenario, both strategies experienced a **-100% maximum drawdown**, effectively wiping out the entire portfolio value.
    - Their returns during the crash were impacted by -1622% and -1979% respectively, compared to baseline, highlighting a severe lack of downside protection.
- **The Failure of Diversification Under Stress:** The 'Correlation Breakdown' scenario underscored a critical market risk.
    - This simulation showed average asset correlation jumping from a near-zero 0.063 in the baseline to 0.388 during the crisis.
    - This indicates that during a liquidity crisis, asset classes fall together, and traditional diversification benefits evaporate. Even the 'Balanced' portfolio suffered significant -60.5% drawdown in this environment.

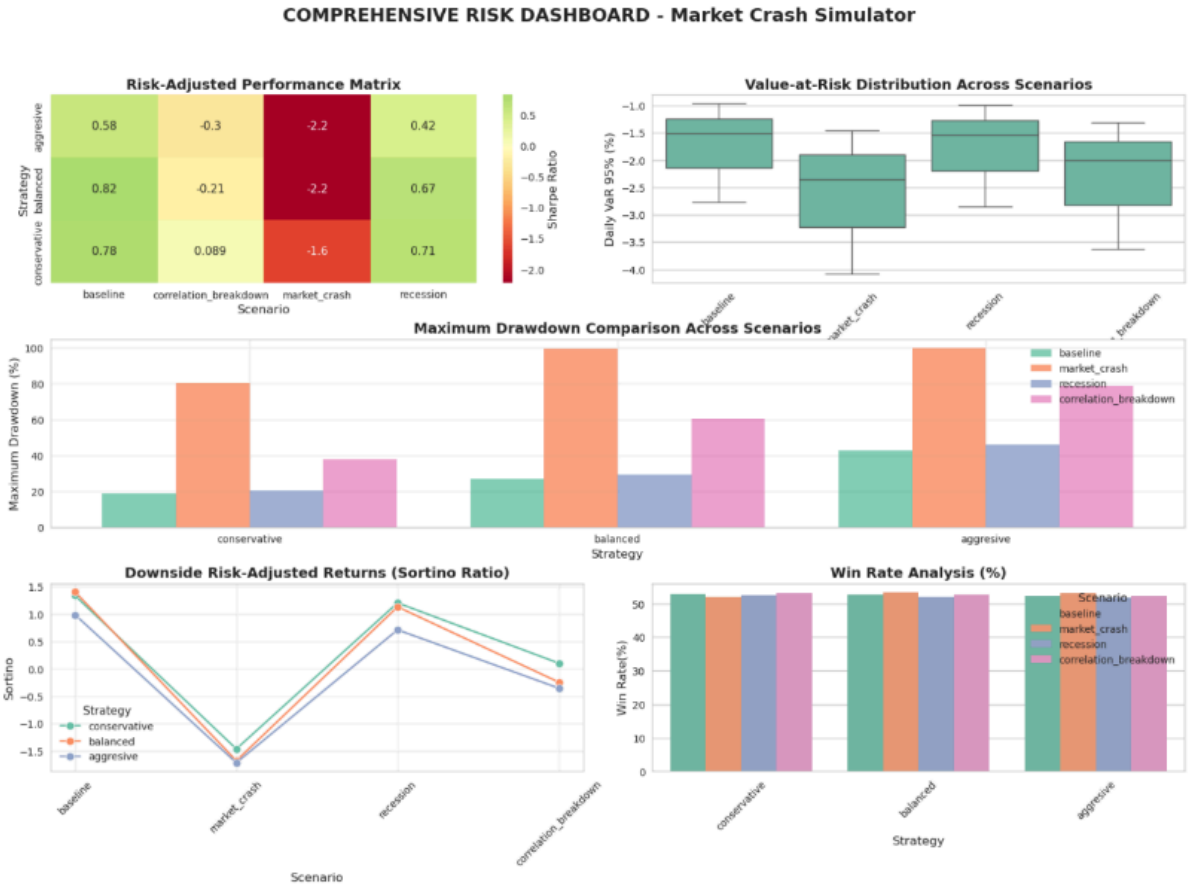
Visualizations: Correlation Breakdown

The chart below visually confirms this finding, showing the rolling correlation between Stocks and Bonds. In the "Correlation Breakdown" scenario, the correlation spikes dramatically, demonstrating the failure of diversification when it is needed the most.



4. Summary Dashboard

The **Comprehensive Risk Dashboard** below provides a high-level summary of all key performance and risk metrics across every strategy and scenario. This dashboard consolidates the analysis, comparing risk-adjusted returns (Sharpe Ratio), downside risk (Sortino Ratio), Value-at-Risk (VaR), and Maximum Drawdown in one complete view, reinforcing the findings on strategy resilience.



5. Conclusion

The results of this simulation analysis are unequivocal. Portfolio resilience is not determined by potential upside in normal markets, but by its ability to preserve capital during severe downturns. Strategies heavily weighted towards high-volatility assets without proper hedging mechanisms are exposed to an unacceptable level of risk.

The ‘Safe Haven’ strategy, with its emphasis on low-volatility and non-correlated assets like Bonds and Gold, has proven to be a robust model for capital preservation. The failure of all other strategies to protect against systemic risk, particularly during the Correlation Breakdown, provides a stark reminder that past performance and standard correlations are not reliable indicators during a crisis.

6. Recommendation

Based on the comprehensive findings of this stress test, this report recommends the following actions:

1. **Adopt Defensive Tilts for Risk-Averse Portfolios:** The ‘Safe Haven’ strategy should be adopted as the default allocation for all portfolios with low-risk tolerance mandate. Its proven ability to weather multiple crisis types is invaluable.
2. **Review and Restructure High-Exposure Portfolios:** All ‘Aggressive’ and ‘Balanced’ strategies must be reviewed. The implementation of capital preservation rules or addition of specific crisis-hedging assets is recommended to mitigate the extreme drawdown risk identified in this analysis.
3. **Integrate Regular Stress-Testing:** This simulation should not be a one-off event. It is recommended that a quarterly stress-testing protocol be established, using updated market parameters to continually assess portfolio vulnerabilities and adapt strategies proactively.