

Quant/Risk Report: Stress Test

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January 21, 2026



Introduction to Stress Tests

- A portfolio stress test is a technique used to assess the stability of financial institutions and investment portfolios in times of economic downturn.
- Method:
 - Freeze Today's Portfolio
 - Pick "Shock Windows"
 - Replay those windows onto today's weights
 - Handle stuff that didn't exist back then
 - Measure damage
- In this presentation we will go over:
 - GFC / Lehman to Bottom (2008-09-15 to 2009-03-09)
 - Eurozone Crisis / US Downgrade (2011-07-22 to 2011-10-03)
 - COVID Crash (2020-02-19 to 2020-03-23)
 - 2022 Rate Shock (2022-01-03 to 2022-06-16)
 - SVB Week (2023-03-08 to 2023-03-15)



Global Financial Crisis and Lehman Brothers Collapse (2008)



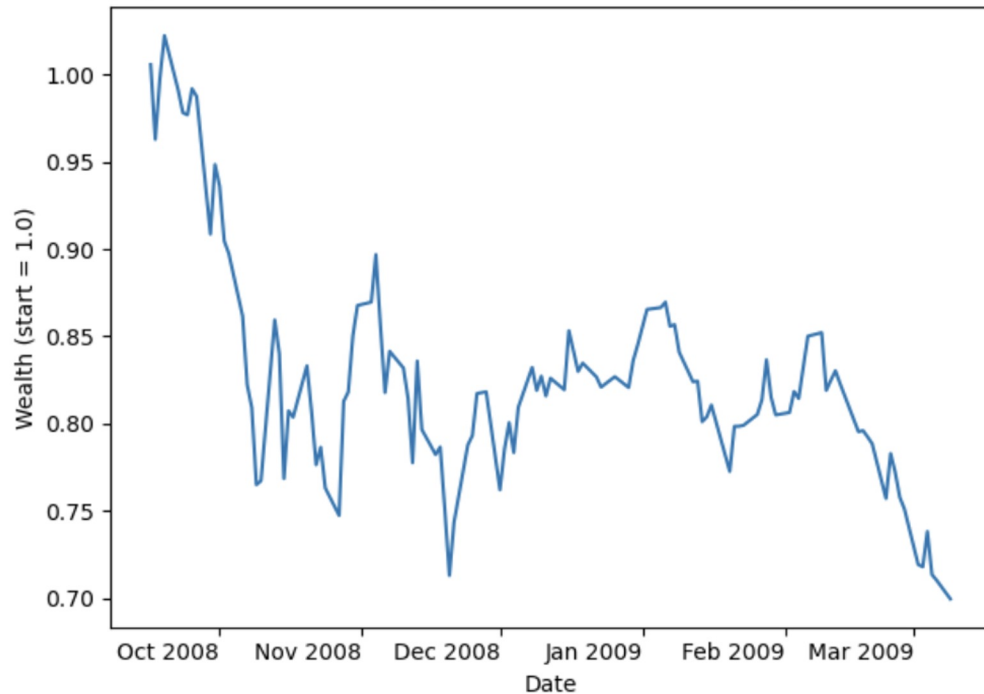
- **What it was:** A global financial meltdown caused by the US housing bubble collapsing and losses spreading through the banking system.
- **Root cause:** Risky mortgages were packaged into “safe-looking” securities, while banks used heavy leverage.
- **What triggered the crash:** Rising mortgage defaults → big losses → lenders stopped trusting each other → credit markets froze.
- **Key moment:** Lehman Brothers failed (Sept 2008), which accelerated panic.
- **Who it hurt:** Homeowners (foreclosures), workers (job losses), banks (failures/bailouts), investors (major market drawdowns).
- **Policy response:** Massive Fed liquidity actions + government interventions (bailouts, guarantees, stimulus) to prevent a deeper collapse.
- **Why do we care?** It’s a scenario where liquidity dries up, correlations spike, and diversified portfolios are still affected..



GFC/Lehman Stress Test

scenario	start	end	cum_return_%	max_drawdown_%	worst_day_%	top_3_detractors	top_3_helpers
GFC / Lehman to Bottom (2008-09-15 to 2009-03-09)	2008-09-15	2009-03-09	-30.04	-31.57	-8.51	VEA, SPY, QQQ	XLU, XLI, LNG

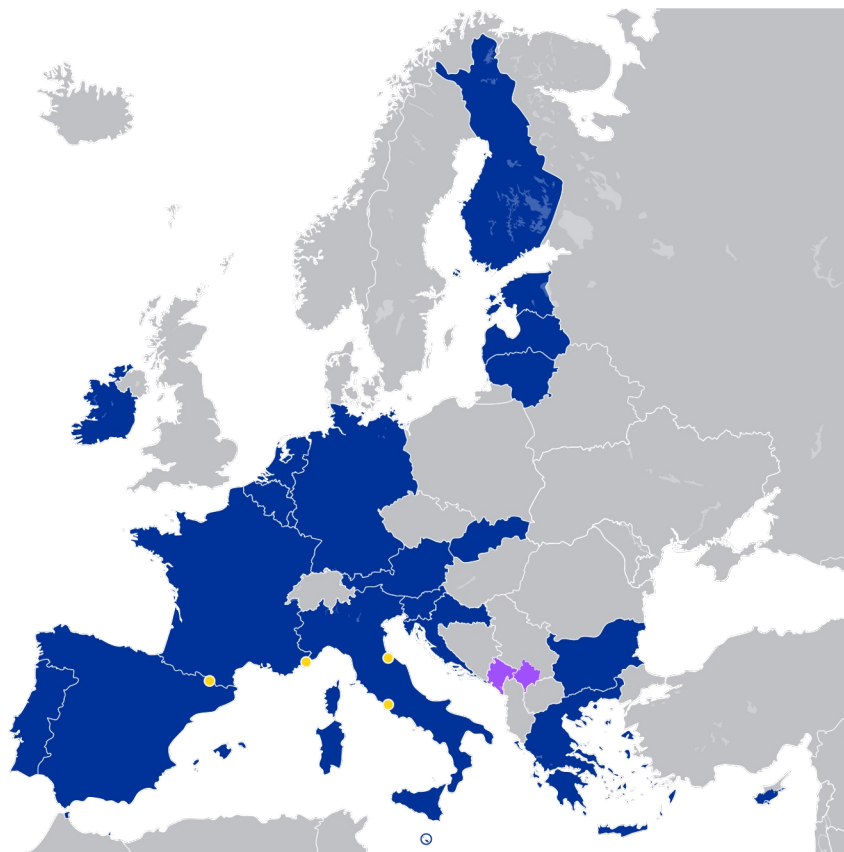
GFC / Lehman to Bottom (2008-09-15 to 2009-03-09) — Wealth Index



- Result: Portfolio would've been about -30% in the 2008 window.
- Worst pain point: Max drawdown ~ -31.6% (peak-to-trough).
- Worst day: -8.5%, showing true “panic” volatility.
- What hurt us: VEA, SPY, QQQ = broad + international + growth equity exposure.
- What helped: XLU (defensive) plus XLI/LNG held up better relative to the rest.



Global European Debt Crisis (July 2011 – October 2011)



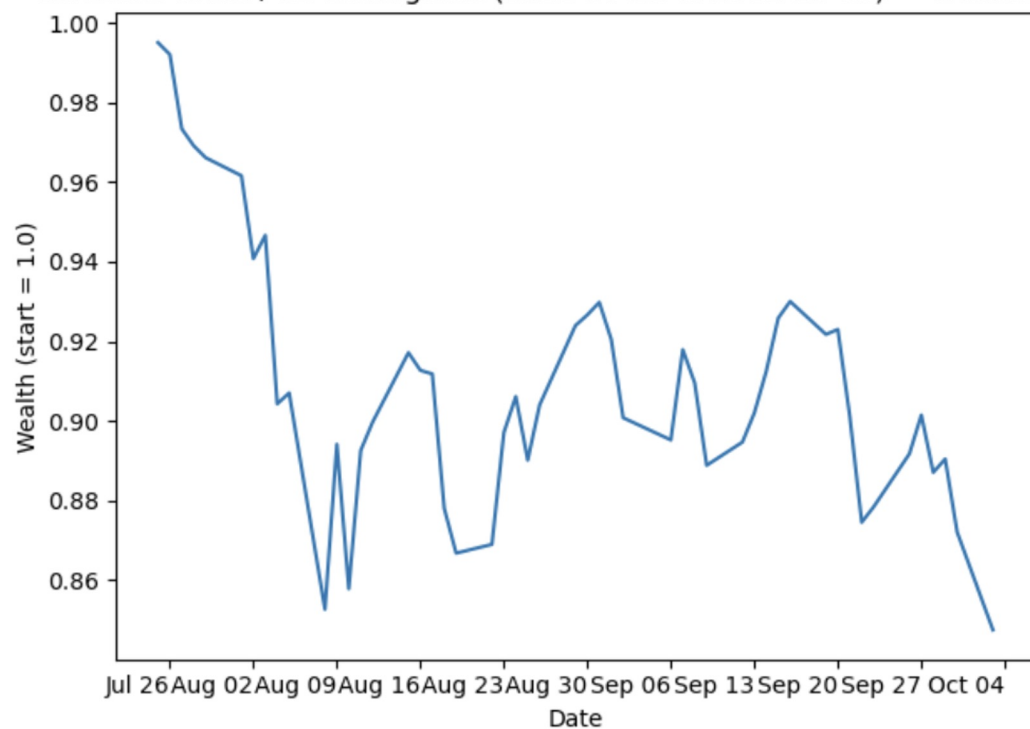
- **What it was:** A 2011 market panic driven by the European sovereign debt crisis (Greece/Italy/Spain risk) plus the US credit rating downgrade.
- **Why markets were hurt:** Investors feared bank exposures + government default risk, so confidence and liquidity dropped fast.
- **What got hit:** Global equities fell hard, especially cyclicals and risk-on assets, and correlations spiked (diversification helped less).
- **What held up better:** “Defensive” areas (often utilities/staples/quality) tended to outperform while risk assets sold off.
- **Why do we care?** It’s a test of macro uncertainty and global contagion without being a full 2008–style system collapse.



Eurozone Debt Crisis Stress Test

scenario	start	end	cum_return_%	max_drawdown_%	worst_day_%	top_3_detractors	top_3_helpers
Eurozone Crisis / US Downgrade (2011-07-22 to 2011-10-03)	2011-07-22	2011-10-03	-15.25	-14.82	-5.99	VEA, LNG, SPY	JNJ, XLI, XLU

Eurozone Crisis / US Downgrade (2011-07-22 to 2011-10-03) — Wealth Index



- **Result:** Portfolio would've been about **-15.3%** in this Eurozone/US downgrade window.
- **Worst pain point:** Max drawdown ~-14.8% (peak-to-trough).
- **Worst day:** -6.0%, a sharp shock day.
- **What hurt us:** VEA, LNG, SPY = international equity + energy exposure + broad market beta.
- **What helped:** JNJ (defensive/quality) plus XLI/XLU held up better relative to the rest.



Covid Crash (Feb – Mar 2020)

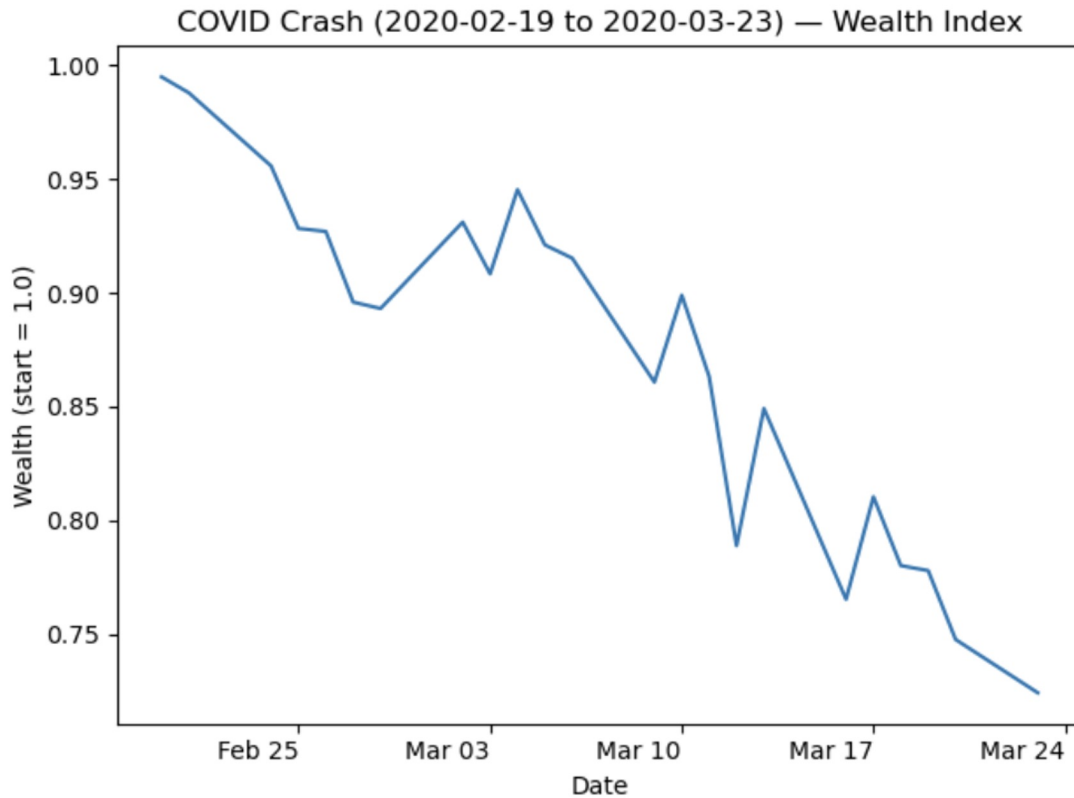


- **What it was:** A global shock from COVID shutdowns that hit travel, consumer spending, and business activity almost overnight.
- **Why markets were hurt:** Earnings expectations dropped fast and investors rushed into safer assets.
- **What got hit:** Broad equities fell hard, especially growth/cyclicals; correlations rose so diversification helped less.
- **What held up better:** Cash and defensive sectors (utilities/staples/healthcare) generally held up better.
- **Why do we care?** It's a test of **speed risk** and how the portfolio behaves during a sudden global stop.



Covid Crash Stress Test

scenario	start	end	cum_return_%	max_drawdown_%	worst_day_%	top_3_detractors	top_3_helpers
COVID Crash (2020-02-19 to 2020-03-23)	2020-02-19	2020-03-23	-27.59	-27.23	-9.88	VEA, SPY, V	XLU, XLI, WMT



- **Result:** Portfolio would've been about **-27.6%** in the COVID crash window.
- **Worst pain point:** Max drawdown ~**-27.2%** (peak-to-trough).
- **Worst day:** **-9.9%**, showing how fast losses can happen in a shutdown-type shock.
- **What hurt us:** VEA, SPY, V = international equities + broad market beta + consumer/payment exposure getting hit together.
- **What helped:** XLU (defensive) plus XLI/WMT held up better relative to the rest.



Rate Shock (January 2022 – June 2022)

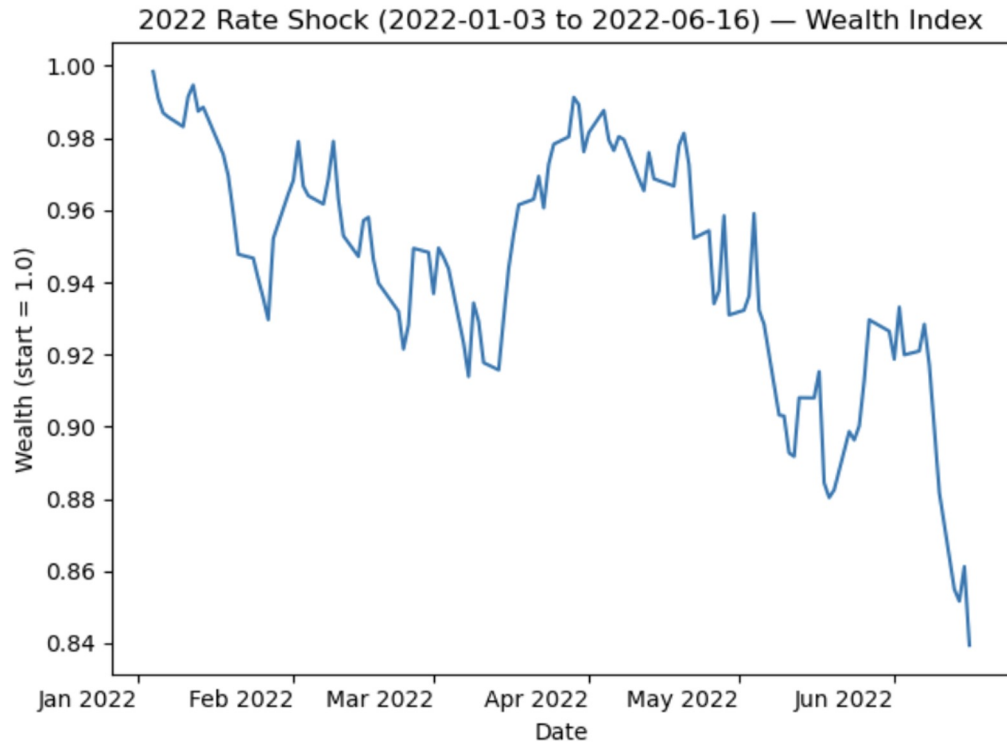


- **What it was:** A sustained selloff driven by inflation staying high and the Fed raising rates aggressively.
- **Why markets were hurt:** Higher rates reduced valuations and tightened financial conditions across the economy.
- **What got hit:** Growth/tech and other rate-sensitive assets were hit more than value/defensive areas.
- **What held up better:** Energy and some value-oriented exposures tended to hold up better relative to growth.
- **Why do we care?** It's a test of **interest-rate sensitivity** and valuation risk, not just "recession" risk.



Rate Shock Stress test

scenario	start	end	cum_return_%	max_drawdown_%	worst_day_%	top_3_detractors	top_3_helpers
COVID Crash (2020-02-19 to 2020-03-23)	2020-02-19	2020-03-23	-27.59	-27.23	-9.88	VEA, SPY, V	XLU, XLI, WMT



- **Result:** Portfolio would've been about **-16.1%** in the 2022 rate shock window.
- **Worst pain point:** Max drawdown ~**15.9%** (peak-to-trough).
- **Worst day:** **-3.4%**, more of a grind-down environment vs one-day panic.
- **What hurt us:** VEA, QQQ, SPY = international equities + growth/tech + broad market exposure.
- **What helped:** T, LNG, NOC held up better relative to the rest in this period.



Silicon Valley Bank Collapse (March 2023)

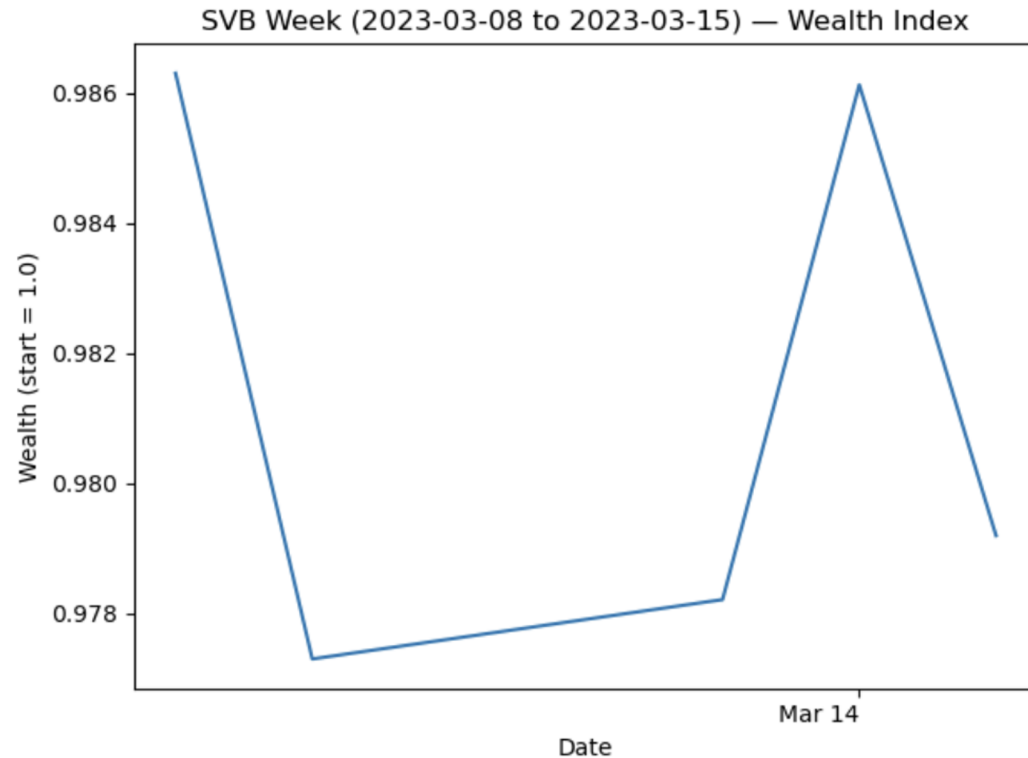


- **What it was:** A banking stress event triggered by the collapse of Silicon Valley Bank and fears of regional bank contagion.
- **Why markets were hurt:** Investors worried about deposit flight, bank balance sheet risk, and tighter lending.
- **What got hit:** Financials and credit-sensitive exposures were more vulnerable in this window.
- **What held up better:** Defensive and “quality” names generally held up better than high-risk assets.
- **Why do we care?** It’s a test of **financial-system stress** without needing a full 2008-type collapse to create damage.



SVB Stress Test

scenario	start	end	cum_return_%	max_drawdown_%	worst_day_%	top_3_detractors	top_3_helpers
SVB Week (2023-03-08 to 2023-03-15)	2023-03-08	2023-03-15	-2.08	-0.91	-1.37	VEA, SPY, LNG	JNJ, QQQ, WMT



- **Result:** Portfolio would've been about **-2.1%** during SVB week.
- **Worst pain point:** Max drawdown **~-0.9%** (peak-to-trough).
- **Worst day:** **-1.4%**, a quick shock move but not a prolonged selloff.
- **What hurt us:** VEA, SPY, LNG = international equity + broad market exposure + energy-related exposure.
- **What helped:** JNJ, QQQ, WMT held up better relative to the rest.

