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CENTER FOR INTERNATIONAL SECURITIES AND DERIVATIVES MARKETS
CISDM

2026 Geopolitical & Macroeconomic Inflationary Stress Tests

A Cross-Asset Geopolitical and Macroeconomic Stress Framework with Plausibility Analysis, and impact on model public portfolios and US College and University Endowment funds

Developed leveraging FIS multi-factor statistical models for scenario modeling and portfolio impacts, and risk advisory partner APTimum.

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Applicability

This document applies to the 2026 geopolitical and macroeconomic inflationary tail-scenario stress-test framework.

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1 Scenarios

Global markets face several correlated risks that could drive large, multi-dimensional, multivariate market moves. These scenarios share a common transmission mechanism: inflation and interest rates. This section presents four forward-looking scenarios that estimate how a market reversal could spread across financial markets. The first three are geopolitical scenarios tied to a single Middle East trajectory, ordered by the extent of the disruption and the number of financial market channels affected. The fourth does not depend on a geopolitical or energy shock. It shows that the same rate-driven market damage could occur without a continued Strait closure or other Middle East disruptions.

As of the August 14 baseline, the U.S.-Iran conflict remains unresolved, with shipping through the Strait of Hormuz severely constrained amid continued military and political confrontation, while Houthi attacks have also increased risks to shipping through the Red Sea and Bab al-Mandab. The June interim agreement (which expired on August 17th) failed to produce a durable de-escalation or restore normal maritime flows, leaving energy supply disruptions and associated inflationary pressures already embedded in the current market environment. All four scenarios start from today's market conditions, which already reflect disruption rather than calm. Each scenario is therefore measured as an incremental move on top of an already stressed baseline.

- **Middle East Escalation (Section 3.1)** takes the ongoing conflict, already the observed state of the market, and extends it into a prolonged, more severe disruption of the Strait of Hormuz (with effects on secondary chokepoints). The war and related maritime disruption are creating inflationary pressure and supply constraints that began in oil and oil distillates (e.g., gasoline, diesel, etc.) and spread further across a wide range of commodities, including, LNG, ethanol, fertilizer, aluminum, petrochemicals, chemical feedstocks, and food stocks. These pressures feed through to interest rates, credit spreads, and broader equity markets. In this first step, the AI sector remains comparatively resilient, staying decoupled on continued AI hype and elevated valuations.
- **Continued Escalation with AI De-rating (Section 3.2)** holds the same Middle East trajectory and oil shock but intensifies the interest rate market effects. As higher rates and a Fed forced to stay restrictive against inflation compress long-duration technology multiples, the AI complex de-rates through rates rather than through earnings. This is the convergence case: the same trigger, but with a different channel.

- **Extreme Escalation (Section 3.3)** is the regional-system tail, in which the disruption spreads beyond a primary chokepoint. It layers a move from today's Red Sea attacks toward sustained closure of the Bab al-Mandab strait, and damage to non-Iranian Gulf producer infrastructure, on top of the Hormuz closure, describing a market with no relief valve. The scenario could also include escalated retaliation from the US or other regional players.
- **FED Trap Persistent inflation (Stagflation triggers) (Section 3.4)** is the second, non-geopolitical family. This tail does not require an oil or energy shock; rather, any persistent core inflation impulse (fiscal, tariffs, wages) that keeps the Fed restrictive and long rates high does the same damage, de-rating long-duration AI and tech through rates just as the oil tail does. It is mapped by how high core inflation runs (PCE 4.5%, 5% or 6%) and for how long (3 to 24 months). As growth is not an explicit input, it turns fully stagflationary only at the longer horizons, where recession risk compounds.

2 Data and Baseline

The starting point for the tail shocks was identifying the key macroeconomic indicators (e.g., inflation, GDP, etc.) affected by the scenario. The next step was to identify a small number of policy variables (i.e., 10 financial assets) directly impacted by changes in these indicators, then use the FIS-APT multi-factor statistical risk model to project these policy variable shocks onto statistical factors. The propagation of the shocks to the other financial assets or portfolios was implied based on their sensitivities to the statistical factors, which capture the co-movements between all assets. In this case, the four scenarios were created based on the perspective of a US investor and the macro factors and related policy variables were identical.

POLICY VARIABLES MAPPED TO MACRO FACTORS				
Macro factors	Policy variable	Financial asset price capture	Industry sectors	Importance
Broad US growth, risk sentiment	S&P 500 Index	US equity risk, earnings expectations, macro growth, policy confidence	Broad market, all sectors	Key cross asset market variable
Duration, growth, AI sensitivity	Nasdaq 100 Index	Long-duration growth, AI capex, discount-rate sensitivity, tech cycle	Technology, communication services	Higher discount rates disproportionately affect long-duration growth and AI valuations
Domestic cyclical, reflation sensitivity	Russell 2000 Index	Domestic cyclical, bank sensitivity, reflation, regional growth, fiscal stimulus sensitivity	Regional banks, small-cap industrials	Distinguishes reflation scenarios from lower-rate scenarios
Fiscal regime, inflation, term premium	30Y Treasury Yield	Deficits, inflation expectations, Treasury issuance, term premium, debt sustainability	REITs, utilities, infrastructure	Key driver with direct sector impacts (REITs, infrastructure, utilities, tech, private equity, real estate and banks)
Fed policy expectations	2Y Treasury Yield	Fed expectations, recession probability, policy tightening / easing path	Banks and financials	Separates fiscal / inflation shocks from monetary / recession shocks
Credit / liquidity stress	HY Credit Spread (ICE BofA HY OAS)	Liquidity stress, refinancing risk, recession fears, systemic risk transmission	Leveraged credit; high-yield energy and financials	Fastest stress transmission channel
Global liquidity, capital flows	US Dollar Index (DXY)	Global liquidity, capital flight, EM stress, relative growth / rate differentials	Exporters, multinationals, materials	Affects deficits and yields which strongly impact global liquidity conditions
Inflation, geopolitical, global demand	WTI Crude Oil	Inflation, geopolitics, global growth, energy supply shocks	Energy, industrials, transportation	Influences inflation expectations, consumer spending, industrials, EMs and credit
Real rates, geopolitical / fiscal stress	Gold	Real rates, fiscal credibility, geopolitical stress, reserve-confidence concerns	Precious-metals miners, materials	Fiscal instability, political confrontation, inflationary stress scenarios
Volatility / risk aversion regime	VIX Index	Volatility regime, risk aversion, uncertainty shock transmission	Defensives: staples, health care	Distinguishes orderly repricing versus panic / stress conditions

Policy variables mapped to macro factors, asset-price capture, and cross-asset importance.

The baseline is the August 14, 2026 close. Crude oil is quoted at front-month futures settlement: WTI crude is at 82 dollars and Brent at 89. The S&P 500 is at 7,786, the Nasdaq 100 at 30,046, and the Russell 2000 at 3,068. The 2-year Treasury yields 4.17 percent, leaving the front end elevated as markets continue to price a restrictive Fed stance, and the 30-year yields 5.25 percent. The current upward-sloping treasury yield curve is exposed to additional bear steepening given geopolitical risk, inflation uncertainty, fiscal concerns, debt issuance and higher term premium. High-yield spreads sit at 267 basis points, the dollar index at 99.7, gold at 4,377 dollars, and the VIX at 14.3. These levels already carry a war-risk premium, because the June interim deal had collapsed by the time the baseline was struck.

BASELINE LEVELS, TEN POLICY VARIABLES, 14 AUGUST 2026		
Factor	Measure	Baseline (August 14, 2026)
S&P 500	Index level	7,786
Nasdaq-100	Index level	30,046
Russell 2000	Index level	3,068
2Y Treasury	Yield	4.17%
30Y Treasury	Yield	5.25%
HY OAS	Option-adjusted credit spread	267 bps
US Dollar (DXY)	Index level	99.7
WTI Crude	USD per barrel	\$82
Gold	USD per ounce	\$4,377
VIX	Index level	14.3

Baseline levels for the ten policy variables. Crude oil (WTI and Brent) is stated at front-month futures settlement; equities, rates, and other series at the August 14, 2026 close.

These starting levels matter for the analysis that follows. The 2-year Treasury yield at 4.17 percent is not neutral; it leaves the front end elevated, signaling that markets continue to price a restrictive Fed stance. The current oil market is inverted (i.e., in backwardation), with WTI at 82 dollars indicating that the front of the curve already carries a near-term war-risk premium, while deferred futures imply little sustained premium. Gold near a record high and a firm dollar also suggest haven demand before any scenario unfolds. In short, the baseline is not a calm market awaiting a shock. It is already stressed, so each scenario is measured as an incremental move on top of that stress rather than from a clean slate.

It is worth adding a note on how that premium is priced. While spot crude sits above expected futures settlement levels, the implied war-risk premium is much lower than market fundamentals and technicals would imply. Multiple dealer estimates put oil at 140 to 180 dollars or higher given closure of the strait and other escalation, with global oil inventories at ~45-year lows relative to demand and an ongoing conflict that will be challenging to resolve. That gap reflects varying factors, particularly demand destruction by China (which could change), and suggests oil prices are being influenced by behavioral biases and emotion, rather than by fundamentals and technicals alone, which in turn implies the market may be underpricing the oil leg that drives the tails below.

3 Tail Scenarios

3.1 Middle East Escalation

The Middle East Escalation scenario represents a material worsening of the conflict and maritime disruption already embedded in the August 14 baseline. The starting market therefore already reflects an ongoing Middle East conflict, disruption through the Straits of Hormuz and Bab al-Mandab, elevated energy prices, and an associated war-risk premium. This scenario assumes that the existing disruption persists for longer and becomes more economically damaging as inventories are markedly depleted, tanker congestion continues, and the physical mechanisms that would normally redistribute available supply become increasingly impaired.

Under these conditions, the same disruption produces a substantially larger and more persistent oil shock than is currently priced into markets. WTI rises 70 percent from the \$82 baseline to approximately \$140 in the first month and remains approximately 50 percent above the baseline five months later. The persistence of the supply shock increases inflationary pressure, widens credit spreads, raises longer-term Treasury yields, strengthens haven demand for gold and the dollar, and produces broader equity-market losses. The Nasdaq remains comparatively resilient because the AI and long-duration technology complex does not yet experience the severe rate-driven de-rating modeled in Section 3.2.

ASSET-CLASS SHOCKS, MIDDLE EAST ESCALATION, 1M TO 5M						
Asset	Baseline	1M	2M	3M	4M	5M
S&P 500	7,786	-9% 7,085	-8.5% 7,124	-7.5% 7,202	-6.5% 7,280	-6% 7,319
Nasdaq-100	30,046	-6% 28,243	-5% 28,544	-4% 28,844	-3% 29,145	-2.5% 29,295
Russell 2000	3,068	-15% 2,608	-14.5% 2,623	-13% 2,669	-12% 2,700	-11% 2,731
2Y Treasury	4.17%	+8 bps 4.25%	+8 bps 4.25%	-5 bps 4.12%	+12 bps 4.29%	-13 bps 4.04%
30Y Treasury	5.25%	+45 bps 5.70%	+50 bps 5.75%	+52 bps 5.77%	+55 bps 5.80%	+55 bps 5.80%
HY OAS	267 bps	+285 bps 552 bps	+265 bps 532 bps	+240 bps 507 bps	+225 bps 492 bps	+215 bps 482 bps
Dollar (DXY)	99.7	+9% 108.7	+9% 108.7	+8.5% 108.2	+8% 107.7	+7.5% 107.2
WTI Crude	\$82	+70% \$140	+66% \$137	+60% \$132	+55% \$128	+50% \$124
Gold	\$4,377	+13% \$4,946	+12.5% \$4,924	+11.5% \$4,880	+10.5% \$4,837	+10% \$4,815
VIX	14.3	+40 pts 54.3	+36 pts 50.3	+33 pts 47.3	+30 pts 44.3	+28 pts 42.3

Table 1: Asset-class shocks, Middle East Escalation, 1M to 5M.

3.2 Continued Escalation in Middle East combined with AI De-rating

This is an instructive tail scenario because it isolates the incremental rate-driven AI de-rating step. It keeps the exact same oil shock as the escalation scenario above but intensifies the interest rate market effects and allows it to reach the part of the market the escalation scenario protects: the AI and long-duration technology complex. The causal chain is worth spelling out link by link. A sustained closure produces an oil shock; the oil shock keeps core inflation elevated; elevated inflation keeps the Fed from easing and pushes it toward hiking; higher expected policy rates lift the whole yield curve; and a higher discount rate compresses the multiples of exactly those long-duration growth names whose value sits furthest out in the future. The AI trade, which is comparatively cushioned in the Middle East Escalation case because its earnings story has been independent to oil, and here it hits through rates instead of earnings.

The difference from the Middle East Escalation scenario is notable in two specific places, and comparing the two tables makes it visible. The Nasdaq 100 falls 26 percent at the trough rather than declining only 6 percent in the Middle East Escalation scenario, and the 2-year rises 70 basis points rather than staying roughly level. The broad equity hit deepens as well: the S&P falls 14 percent at one month against 9 percent in the Middle East Escalation case, while gold reverses lower as the stronger rate shock outweighs its haven support. What stays essentially unchanged is the oil path, the credit widening, the dollar and the VIX; the incremental damage shows up in equities, rates and gold. That is the whole point of running it as a separate scenario: it shows the incremental damage not coming from a bigger shock but from the rate channel intensifying off the same trigger. This is the convergence case in its purest form, where the oil shock and the AI de-rating happen together rather than in isolation, and it is the reason a portfolio that thinks it is hedged on oil alone can still be badly surprised.

ASSET-CLASS SHOCKS, ESCALATION WITH AI DE-RATING, 1M TO 5M						
Asset	Baseline	1M	2M	3M	4M	5M
S&P 500	7,786	-14% 6,696	-16% 6,540	-15% 6,618	-13% 6,774	-12% 6,852
Nasdaq-100	30,046	-22% 23,436	-26% 22,234	-24% 22,835	-20% 24,037	-18% 24,638
Russell 2000	3,068	-17% 2,546	-18% 2,516	-17% 2,546	-15% 2,608	-14% 2,638
2Y Treasury	4.17%	+40 bps 4.57%	+55 bps 4.72%	+65 bps 4.82%	+70 bps 4.87%	+70 bps 4.87%
30Y Treasury	5.25%	+55 bps 5.80%	+60 bps 5.85%	+62 bps 5.87%	+65 bps 5.90%	+65 bps 5.90%
HY OAS	267 bps	+285 bps 552 bps	+265 bps 532 bps	+240 bps 507 bps	+225 bps 492 bps	+215 bps 482 bps
Dollar (DXY)	99.7	+9% 108.7	+9% 108.7	+8.5% 108.2	+8% 107.7	+7.5% 107.2
WTI Crude	\$82	+70% \$140	+66% \$137	+60% \$132	+55% \$128	+50% \$124
Gold	\$4,377	-2% \$4,289	-2.5% \$4,268	-3% \$4,246	-3.5% \$4,224	-4% \$4,202
VIX	14.3	+40 pts 54.3	+36 pts 50.3	+33 pts 47.3	+30 pts 44.3	+28 pts 42.3

Table 2: Asset-class shocks, Continued Escalation with AI de-rating, 1M to 5M.

The sector view of the same de-rating tail shows how key industries are affected. Energy and defense have the strongest positive returns, while consumer staples and health care remain modestly positive and the rate-sensitive and cyclical sectors absorb the deepest losses.

SECTOR-LEVEL SHOCKS, ESCALATION WITH AI DE-RATING, 1M TO 5M							
Sector	ETF	Baseline	1M	2M	3M	4M	5M
ENERGY & GEOPOLITICAL WINNERS							
Energy	XLE	\$61.91	+40% \$86.67	+38% \$85.44	+35% \$83.58	+33% \$82.34	+32% \$81.72
Defense / Aero	ITA	\$253.22	+22% \$308.93	+21% \$306.40	+20% \$303.86	+19% \$301.33	+19% \$301.33
DEFENSIVE							
Consumer Staples	XLP	\$86.09	+2% \$87.81	+2% \$87.81	+2.5% \$88.24	+3% \$88.67	+3% \$88.67
Health Care	XLV	\$167.37	-1% \$165.70	-1% \$165.70	0% \$167.37	+0.5% \$168.21	+1% \$169.04
RATE-SENSITIVE / CYCLICAL (re-specified down)							
Utilities	XLU	\$44.31	-3% \$42.98	-3.5% \$42.76	-3% \$42.98	-2.5% \$43.20	-2% \$43.42
Financials	XLF	\$58.16	-16% \$48.85	-15% \$49.44	-13.5% \$50.31	-12.5% \$50.89	-12% \$51.18
Industrials	XLI	\$186.51	-13% \$162.26	-12% \$164.13	-10.5% \$166.93	-10% \$167.86	-9% \$169.72
Infrastructure	PAVE	\$58.59	-4% \$56.25	-4.5% \$55.95	-4% \$56.25	-3.5% \$56.54	-3% \$56.83
REITs	VNQ	\$98.83	-12% \$86.97	-13% \$85.98	-12% \$86.97	-11% \$87.96	-10% \$88.95

Continued Escalation with AI de-rating: sector-level shocks, 1M to 5M.

3.3 Extreme Escalation

The Extreme Escalation scenario is a regional conflagration versus a single-chokepoint event and requires three things to happen at once. All three are at least partly visible today, which is what separates this from a purely hypothetical worst case. The first is a sustained Hormuz closure, which has already been triggered. The second is a move from today's ongoing Red Sea attacks to sustained major disruption or effective closure of the Bab al-Mandab strait, the southern chokepoint where Houthi attacks are already occurring, including a deadly ship attack on August 11. The corridor is not yet shut to the degree as Hormuz, with roughly 30 transits still reported in the latest data, so the extreme leg is the development of the current attacks into a lasting closure that lengthens tanker routes and compounds the supply squeeze. The third is damage to Gulf producer infrastructure that is not Iranian, which removes some of the spare capacity that would otherwise backfill the shortfall. Each leg on its own is serious; together they describe a market with

no relief valve.

The calibration is anchored to outside estimates which matters for credibility. JPMorgan (June 2026 update) estimated Brent at 120 to 130 near term and above 150 if the disruption persists for another full month, and the wider set of Street estimates runs as high as 200. The central path modeled here peaks at WTI near 165 dollars, equivalently Brent near 170, at three months, which is within this range rather than at the extreme. The rationale is that given there is an exhausted buffer with very limited inventory available to dampen the move, the supply shock reaches prices with unusually strong pass-through, and because inflation is already the binding constraint, the Federal Reserve has no room to ease into the growth hit.

ASSET-CLASS SHOCKS, EXTREME ESCALATION, 1M TO 5M						
Asset	Baseline	1M	2M	3M	4M	5M
S&P 500	7,786	-16% 6,540	-20% 6,229	-22% 6,073	-20% 6,229	-18% 6,385
Nasdaq-100	30,046	-20% 24,037	-25% 22,534	-27% 21,934	-25% 22,534	-22% 23,436
Russell 2000	3,068	-22% 2,393	-27% 2,240	-30% 2,148	-28% 2,209	-25% 2,301
2Y Treasury	4.17%	+85 bps 5.02%	+125 bps 5.42%	+150 bps 5.67%	+135 bps 5.52%	+110 bps 5.27%
30Y Treasury	5.25%	+70 bps 5.95%	+95 bps 6.20%	+115 bps 6.40%	+105 bps 6.30%	+95 bps 6.20%
HY OAS	267 bps	+325 bps 592 bps	+425 bps 692 bps	+500 bps 767 bps	+460 bps 727 bps	+410 bps 677 bps
Dollar (DXY)	99.7	+6% 105.7	+8% 107.7	+9% 108.7	+8% 107.7	+7% 106.7
WTI Crude	\$82	+72% \$142	+89% \$156	+100% \$165	+94% \$160	+83% \$151
Gold	\$4,377	+10% \$4,815	+14% \$4,990	+16% \$5,077	+15% \$5,034	+14% \$4,990
VIX	14.3	+22 pts 36.3	+30 pts 44.3	+35 pts 49.3	+30 pts 44.3	+26 pts 40.3

At the sector level the extreme tail is broader and deeper, with energy and defense the only havens and every rate-sensitive and cyclical group down sharply.

SECTOR-LEVEL SHOCKS, EXTREME ESCALATION, 1M TO 5M							
Sector	ETF	Baseline	1M	2M	3M	4M	5M
ENERGY & GEOPOLITICAL WINNERS							
Energy	XLE	\$61.91	+30% \$80.48	+38% \$85.44	+42% \$87.91	+40% \$86.67	+36% \$84.20
Defense / Aero	ITA	\$253.22	+14% \$288.67	+18% \$298.80	+20% \$303.86	+19% \$301.33	+18% \$298.80
DEFENSIVE							
Consumer Staples	XLP	\$86.09	-6% \$80.92	-8% \$79.20	-9% \$78.34	-8% \$79.20	-7% \$80.06
Health Care	XLV	\$167.37	-8% \$153.98	-11% \$148.96	-12% \$147.29	-11% \$148.96	-10% \$150.63
RATE-SENSITIVE / CYCLICAL (re-specified down)							
Utilities	XLU	\$44.31	-9% \$40.32	-12% \$38.99	-13% \$38.55	-12% \$38.99	-11% \$39.44
Financials	XLF	\$58.16	-18% \$47.69	-23% \$44.78	-25% \$43.62	-23% \$44.78	-21% \$45.95
Industrials	XLI	\$186.51	-19% \$151.07	-24% \$141.75	-26% \$138.02	-24% \$141.75	-22% \$145.48
Infrastructure	PAVE	\$58.59	-20% \$46.87	-25% \$43.94	-27% \$42.77	-25% \$43.94	-23% \$45.11
REITs	VNQ	\$98.83	-22% \$77.09	-27% \$72.15	-29% \$70.17	-27% \$72.15	-25% \$74.12

Extreme Escalation: sector-level shocks, 1M to 5M.

What makes this tail shock different from every other scenario is the behavior of the front end of the curve. The 2-year rises 150 basis points to 5.67 percent, which implies a terminal policy rate near 5.5 to 6.0 percent against 3.50 to 3.75

percent today. In an ordinary recession the Fed would cut rates, and the front end would rally, providing a cushion. Here the Fed is forced to tighten into the growth shock because the shock is inflationary at its source, so there is no policy put and no cushion. The consequences cascade from there. The equity drawdown is comparable in severity to the 2022 drawdown, with the S&P down 22 percent at the trough, the Russell down 30, and the Nasdaq down 27, against the realized 2022 peak-to-trough moves of roughly 25 percent on the S&P and 35 percent on the Nasdaq 100. Credit gaps 500 basis points wider as default expectations spike, and, critically, the 30-year sells off 115 basis points alongside equities, so duration provides no hedge in either the short or the long end of the curve. Only energy, up about 42 percent at the peak, and defense, up 20 percent, finish positive within equities, leaving a long-only equity book with almost nowhere to hide. Cross-asset protection comes from gold, which rises materially in the scenario, or from an outright short in duration.

3.4 FED Trap Persistent inflation (Stagflation triggers)

The final tail scenario is structurally different than the first three and shows where risk emanates. Again, this tail is not linked to oil, energy, or geopolitical shocks. Instead, persistent core inflation (core PCE) can arise from fiscal deficits, US debt issuance levels, tariffs, wage growth, or other sources. In this case, inflation simply stays higher for longer than the market expects. What matters is the consequence: the Fed stays restrictive, the front end stays elevated, and long-duration AI and technology assets stay under pressure through rates, for quarters rather than weeks, just as the oil tail does. In that sense the strait is one possible trigger for this scenario, but not a necessary one, which is sobering for a portfolio that believes it has hedged the geopolitical risk specifically.

This case is mapped by how hot core inflation runs and is reported below at the twelve-month horizon, because it is a slow grind with damage accumulating over a year. Core PCE is simply used to characterize the inflation regime with shocks for the key assets when core PCE increases to 4.5, 5, and 6 percent. The scenario spans a plausible-but-elevated outcome through a genuine re-run of 2022. MOVE is included in these tables as a supplemental bond-volatility diagnostic for the Fed Trap and is not one of the ten core policy variables used in the cross-scenario factor framework.

FED PERSISTENT INFLATION, ASSET SHOCKS BY CORE PCE REGIME, 12M				
Asset	Baseline	PCE 4.5%	PCE 5%	PCE 6%
S&P 500	7,786	-8% 7,163	-16% 6,540	-25% 5,840
Nasdaq-100	30,046	-12% 26,440	-24% 22,835	-36% 19,229
2Y Treasury	4.17%	+30 bps 4.47%	+90 bps 5.07%	+160 bps 5.77%
30Y Treasury	5.25%	+25 bps 5.50%	+60 bps 5.85%	+110 bps 6.35%
HY OAS	267 bps	+90 bps 357 bps	+200 bps 467 bps	+360 bps 627 bps
VIX	14.3	+8 pts 22.3	+16 pts 30.3	+26 pts 40.3
Russell 2000	3,068	-10% 2,761	-19% 2,485	-28% 2,209
Dollar (DXY)	99.7	+3% 102.7	+7% 106.7	+12% 111.7
WTI Crude	\$82	+5% \$87	+8% \$89	+12% \$92
Gold	\$4,377	-3.3% \$4,233	-3.3% \$4,233	-3.3% \$4,233
MOVE (bond vol)	70	+38 pts 108	+68 pts 138	+98 pts 168

Table 4: FED Trap Persistent inflation (Stagflation triggers) shocks at the 12-month horizon, by core inflation regime.

Reporting results across three inflation regimes clarifies the potential market impact. If core PCE rises to 4.5%, the S&P 500 falls 8% over twelve months and the 2-year Treasury yield increases 30 basis points—an uncomfortable but manageable outcome. At 5% core PCE, the S&P 500 falls 16% and the 2-year yield rises 90 basis points. At 6%, closest to the realized 2022 experience, the S&P 500 falls 25%, the 2-year yield rises 160 basis points to 5.77%, and high-yield spreads more than double to 627 basis points. Across all three regimes, the defining risk is the same: equities and the bond hedge decline together as yields rise while stocks fall. This is the same 60/40 allocation failure investors experienced in 2022, driven by inflation—not growth—as the central bank's primary concern. The higher-for-longer case

is included because it does not require the Strait to close, making it a live risk even if geopolitical tensions ease.

The table below gives the full horizon detail for the 6% core PCE inflation scenario, over six-to-twenty-four-month time horizons. The other scenarios can be found in the appendix below.

FED PERSISTENT INFLATION, ASSET STRESS, 6% CORE PCE, 6M TO 24M				
Asset	Baseline	6M	12M	24M
S&P 500	7,786	-21.2% 6,135	-25% 5,840	-31.2% 5,357
Nasdaq-100	30,046	-30.6% 20,852	-36% 19,229	-45% 16,525
Russell 2000	3,068	-23.8% 2,338	-28% 2,209	-35% 1,994
2Y Treasury	4.17%	+136 bps 5.53%	+160 bps 5.77%	+200 bps 6.17%
30Y Treasury	5.25%	+93.5 bps 6.19%	+110 bps 6.35%	+137.5 bps 6.62%
HY OAS	267 bps	+306 bps 573 bps	+360 bps 627 bps	+450 bps 717 bps
Dollar (DXY)	99.7	+10.2% 109.9	+12% 111.7	+15% 114.7
WTI Crude	\$82	+10.2% \$91	+12% \$92	+15% \$95
Gold	\$4,377	-2.7% \$4,259	-3.3% \$4,233	-4% \$4,202
VIX	14.3	+21.2 pts 35.5	+26 pts 40.3	+31.2 pts 45.5
MOVE (bond vol)	70	+83 pts 153	+98 pts 168	+122 pts 192

FED Trap Persistent inflation (Stagflation triggers) Scenarios: asset stress at core PCE approximately 6%, 6M to 24M.

At the sector level the dispersion driven by interest rates and only energy finishes positive.

FED PERSISTENT INFLATION, SECTOR STRESS BY CORE PCE REGIME, 12M					
Sector	ETF	Baseline	PCE 4.5% (12M)	PCE 5% (12M)	PCE 6% (12M)
Tech	XLK	\$190.01	-13% \$165.31	-26% \$140.61	-38% \$117.81
REITs	VNQ	\$98.83	-10% \$88.95	-20% \$79.06	-30% \$69.18
Infrastructure	PAVE	\$58.59	-7% \$54.49	-15% \$49.80	-23% \$45.11
Industrials	XLI	\$186.51	-7% \$173.45	-15% \$158.53	-22% \$145.48
Financials	XLF	\$58.16	-5% \$55.25	-12% \$51.18	-20% \$46.53
Utilities	XLU	\$44.31	-4% \$42.54	-9% \$40.32	-15% \$37.66
Health Care	XLV	\$167.37	-3% \$162.35	-7% \$155.65	-12% \$147.29
Consumer Staples	XLP	\$86.09	-2% \$84.37	-5% \$81.79	-9% \$78.34
Defense / Aero	ITA	\$253.22	-2% \$248.16	-5% \$240.56	-9% \$230.43
Energy	XLE	\$61.91	+4% \$64.39	+7% \$66.24	+10% \$68.10

FED Trap Persistent inflation (Stagflation triggers) Scenarios: sector stress at the 12-month horizon, across core-PCE regimes.

A back-test anchors these regimes to the realized 2022 drawdown at the asset and sector levels. While the 2026 and 2022 inflationary regimes vary (e.g., 2022 demand-driven broad inflation with Russia-Ukraine oil shock versus 2026 systemic, supply (initially oil and distillates) shock, actual 2022 market moves support the forward looking 2026 stress scenarios.

FED PERSISTENT INFLATION, ASSET REGIMES VERSUS REALIZED 2022, 12M						
Asset	2022 start	Realized 2022	Persistent ~4.5%	Hike ~5%	Entrenched ~6%	Closest
S&P 500	4,797	-25.4% 3,579	-8% 4,413	-16% 4,029	-25% 3,598	Entrenched
Nasdaq-100	16,501	-34.8% 10,759	-12% 14,521	-24% 12,541	-36% 10,561	Entrenched
Russell 2000	2,273	-27.4% 1,650	-10% 2,046	-19% 1,841	-28% 1,637	Entrenched
2Y Treasury	0.77%	+384 bps 4.61%	+30 bps 1.07%	+90 bps 1.67%	+160 bps 2.37%	Entrenched
30Y Treasury	2.02%	+235 bps 4.37%	+25 bps 2.27%	+60 bps 2.62%	+110 bps 3.12%	Entrenched
HY OAS	278 bps	+305 bps 583 bps	+90 bps 368 bps	+200 bps 478 bps	+360 bps 638 bps	Entrenched
Dollar (DXY)	96.2	+18.6% 114.1	+3% 99.1	+7% 102.9	+12% 107.7	Entrenched
WTI Crude	\$76	+62.6% \$124	+5% \$80	+8% \$82	+12% \$85	Entrenched
Gold	\$1,800	+13.8% \$2,048	-3.3% \$1,741	-3.3% \$1,741	-3.3% \$1,741	Uniform
VIX	17.2	+19.9 pts 37.1	+8 pts 25.2	+16 pts 33.2	+26 pts 43.2	Hike
MOVE (bond vol)	~77	~160	105	135	165	Entrenched

FED Trap Persistent inflation (Stagflation triggers) regimes back-tested against the realized 2022 peak-to-trough stress, 12-month horizon. The 2022 column shows peak-to-trough stress moves, not calendar-year returns.

FED PERSISTENT INFLATION, SECTOR REGIMES VERSUS REALIZED 2022, 12M						
Sector	ETF	Realized 2022	Persistent ~4.5%	Hike ~5%	Entrenched ~6%	Closest
Mega / Long-Dur Tech	XLK	-28.2%	-13%	-26%	-38%	Hike
REITs	VNQ	-26.1%	-10%	-20%	-30%	Entrenched
Industrials	XLI	-13.3%	-7%	-15%	-22%	Hike
Infrastructure	PAVE	-2%	-7%	-15%	-23%	Persistent
Financials	XLF	-1.7%	-5%	-12%	-20%	Persistent
Health Care	XLV	-2.7%	-3%	-7%	-12%	Persistent
Consumer Staples	XLP	-1.0%	-2%	-5%	-9%	Persistent
Utilities	XLU	+1.6%	-4%	-9%	-15%	Persistent
Defense / Aero	ITA	+8%	-2%	-5%	-9%	Persistent

FED Trap Persistent inflation (Stagflation triggers) sector regimes versus the 2022 sector drawdown, 12-month horizon.

4 Historical Calibration

To calibrate the scenarios, the shock sizes are compared to realized crises (e.g., 2022, COVID, 2008) noting that the current regime is most like 2022 given inflationary pressures and rate levels. The discipline is to keep each move inside a previously observed historical range (where available). For example, the 100 percent move in oil the Extreme Escalation case appears outsized, but it is comfortably inside the dot-com-era precedent, where oil rose more than 200% off a low base, and it is only about 1.6 times the 2022 shock of roughly 63 percent. In other words, the most aggressive oil assumption in the whole study is below the worst of the last 35+ years.

Credit and rates are treated similarly. High-yield spreads widening 500 basis points in the Extreme case is between the 2022 move of about 305 and the COVID move of about 717, and well below the 2008 outsized move of nearly 1,400, which places it as a severe but non-systemic credit event rather than a full financial crisis. The rates shocks were set deliberately inside the crisis precedents rather than at them, which is more conservative. The dot-com episode moved

the 2-year 235 basis points from a 4.56 percent starting level, and since that starting level is the closest historical match to today's 4.17 percent, it is the fairest benchmark available; the Extreme case's 150 basis point move is meaningfully short of it.

In addition, compared against the WTI futures strip, the forward curve is backwardated and prices in essentially no sustained war premium, which means every scenario is a deliberate departure from what the market itself is pricing. The market is taking one view; this tail scenario framework takes another. The Mahalanobis analysis in Section 5 translates partially qualitative estimates into a “plausibility” measure, by measuring how far each scenario is from historical realizations.

The scenario shocks are checked against realized crises and against the market's own oil curve.

MODELED SCENARIO LEGS VERSUS REALIZED CRISIS EPISODES					
Episode / scenario	Oil start	Oil peak %	2Y max	30Y max	HY OAS widening
REALIZED CRISIS EPISODES					
Dotcom / 1999-2001	\$12	+202%	+235 bps	+160 bps	+389 bps
GFC / 2008	\$99	+46%	+16 bps	+44 bps	+1,387 bps
COVID / 2020	\$50	+7%	+9 bps	+13 bps	+717 bps
2022 inflation (primary analog)	\$76	+62%	+384 bps	+235 bps	+305 bps
MODELED SCENARIOS					
Middle East Escalation	\$82	+70%	+12 bps	+55 bps	+285 bps
Continued Escalation with AI De-rating	\$82	+70%	+70 bps	+65 bps	+285 bps
Extreme Escalation	\$82	+100%	+150 bps	+115 bps	+500 bps

Modeled scenario legs versus realized crisis episodes (Bloomberg daily series).

SCENARIO OIL PATHS VERSUS THE WTI FUTURES STRIP, 1M TO 5M					
Horizon	Futures strip	Mid-East Escalation (3.1)	AI De-rating (3.2)	Extreme (3.3)	Extreme vs mkt
SCENARIO HORIZONS vs THE WTI FUTURES STRIP					
1M Sep-26	\$82	\$140	\$140	\$142	+73%
2M Oct-26	\$81	\$137	\$137	\$156	+93%
3M Nov-26	\$80	\$132	\$132	\$165	+106%
4M Dec-26	\$78	\$128	\$128	\$160	+105%
5M Jan-27	\$77	\$124	\$124	\$151	+96%
LONG-DATED STRIP · CONTEXT (futures only, no scenario overlay)					
Futures curve	Jul-27 \$70	Jul-30 \$65	Jul-35 \$57	Feb-37 \$55	vs \$82 front-month WTI

Scenario oil paths versus the WTI futures strip, with the extreme-case deviation from the market.

5 Historical Market Extremeness (Mahalanobis Scores)

5.1 Method

The scenario tables above estimate market moves, but not whether those combinations of moves are unusual or historically extreme. Two scenarios can both appear severe, yet one may lie well within historical experience while the other lies far outside the range of previously observed market behavior. This historical extremeness is quantified using the Mahalanobis distance, which measures how far a scenario's market shock vector lies relative to the center of the historical risk-factor distribution while accounting for the historical volatility of each factor and the historical correlations among the factors. For example, if oil prices and interest rates are historically positively correlated, a scenario in which both move sharply together will generally have a lower Mahalanobis distance than an otherwise similar scenario that assumes the same individual shocks but ignores their historical correlation.

For a shock vector $\mathbf{x}_0$ drawn from a factor distribution with a well-defined mean and covariance matrix, the squared Mahalanobis distance is:

$$D^2 = (\mathbf{x}_0 - \bar{\mathbf{x}})^\top \Sigma^{-1} (\mathbf{x}_0 - \bar{\mathbf{x}})$$

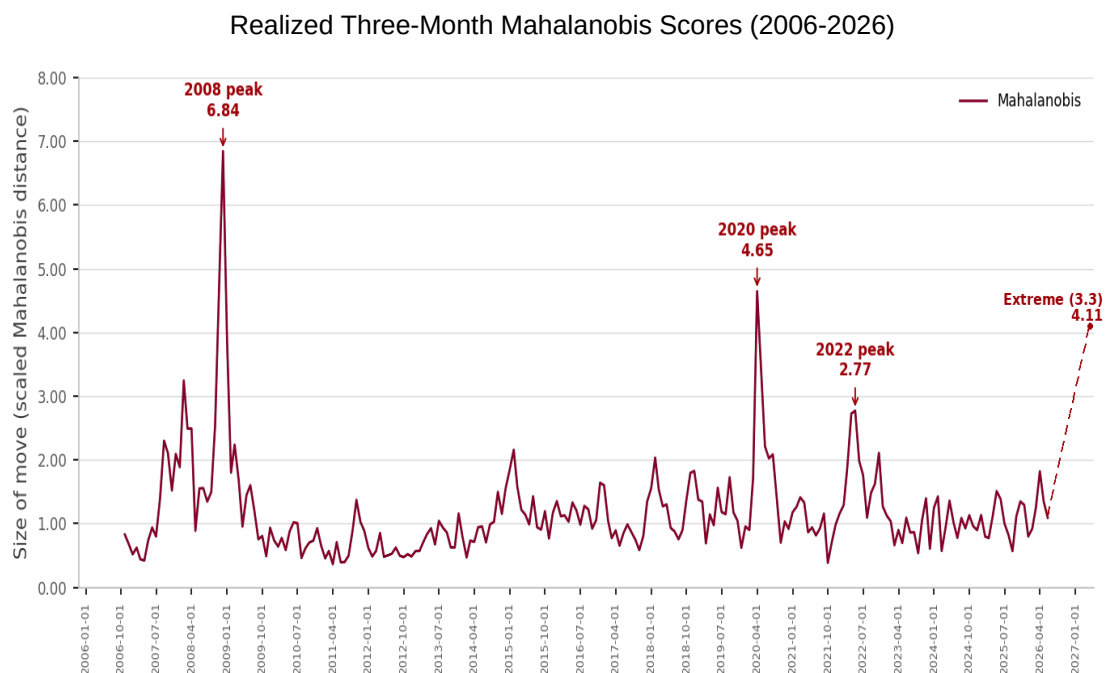
To keep distances comparable across factor sets of different size, the analysis uses the scaled Mahalanobis distance, which divides by the number of risk factors n :

$$D_{\text{scaled}} = \sqrt{\frac{1}{n} (\mathbf{x}_0 - \bar{\mathbf{x}})^\top \Sigma^{-1} (\mathbf{x}_0 - \bar{\mathbf{x}})}$$

The empirical distribution is constructed from twenty years of historical factor returns spanning June 2006 through June 2026, providing a broad sample of market environments and historical crises. Rather than estimating a single covariance matrix over the full sample, the covariance matrix for each historical observation is estimated using a rolling three-year window. This allows each Mahalanobis score to reflect the volatility and correlation structure prevailing at the time of the historical event, while the full twenty-year history provides the empirical benchmark against which scenarios are compared. Separate covariance matrices are estimated for each scenario horizon because both volatility and cross-factor correlations evolve as the horizon lengthens.

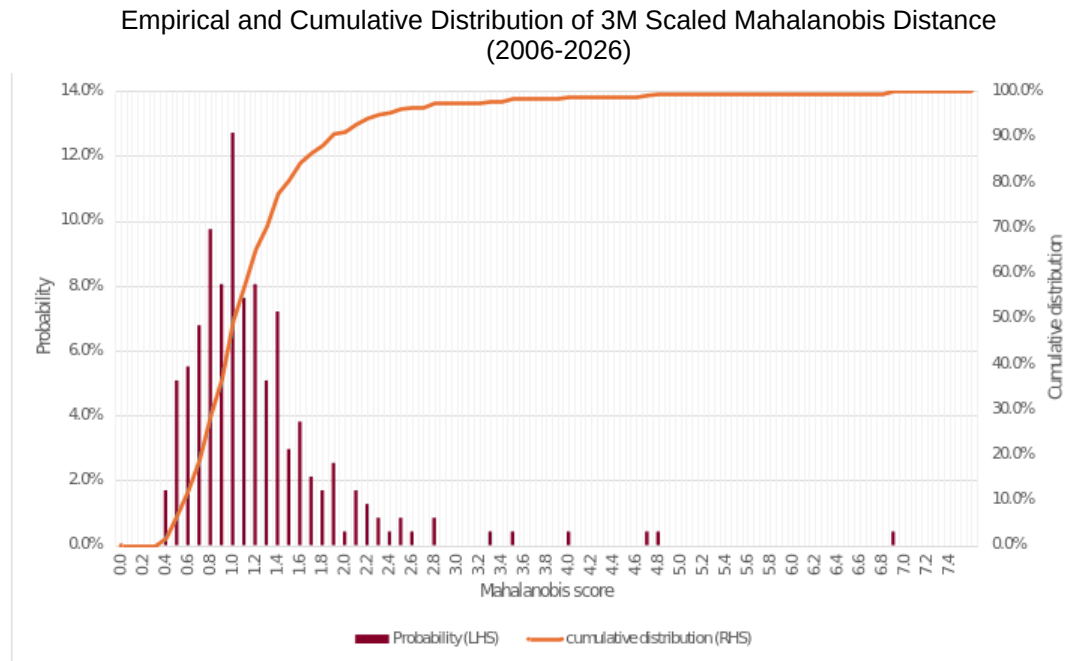
5.2 Historical Distribution of Mahalanobis Scores

Rather than assuming a theoretical probability distribution for the scaled Mahalanobis scores, historical extremeness (i.e., historical statistical rarity) is assessed non-parametrically using the empirical distribution of realized market shocks. The empirical distribution of the scaled distance is built from realized factor shocks over the twenty years from June 30, 2006, to June 30, 2026, using the variance-covariance matrix estimated from the rolling three-year window associated with each historical observation. The chart below plots the realized three-month scaled Mahalanobis distances (i.e., the multivariate analogue of a traditional Z-score) through that history alongside prior market crises and the forward-looking Extreme Escalation scenario. Larger scores indicate market shock vectors that are increasingly unusual relative to historical experience. The three-month horizon was selected because it is common to all scenarios.



The resulting empirical distribution provides the benchmark against which each scenario's Mahalanobis score is interpreted. Most realized three-month observations produce scaled Mahalanobis scores near 1.0, while the distribution has a long right tail. The 2008 global financial crisis reaches roughly 6.9, the 2020 pandemic sits near 4.6, and the 2022

inflation shock near 2.8. Reviewing a scenario's scaled distance against this cumulative distribution gives its exceedance probability, the share of history that was more extreme than the scenario.



5.3 Where Our Scenarios Fall

Each scenario's scaled Mahalanobis distance is mapped onto the empirical distribution to give an exceedance probability. The table below reports both at the three-month horizon given common horizon coverage across scenarios.

Scaled Mahalanobis Distance and Exceedance Probability by Scenario, Three-Month Horizon.

SCALED MAHALANOBIS DISTANCE AND EXCEEDANCE PROBABILITY, 3M		
Scenario	Scaled Mahalanobis* distance	Exceedance probability
Middle East Escalation (Section 3.1)	1.27	35%
Continued Escalation with AI de-rating (Section 3.2)	2.05	9%
Extreme Escalation (Section 3.3)	4.11	1%
FED Trap, core PCE 5% (Section 3.4)	0.67	88%
FED Trap, core PCE 6% (Section 3.4)	1.45	22%

***Mahalanobis Distance:** A correlation-adjusted, multidimensional distance measure that quantifies how far a point lies from the center of a multivariate data distribution while accounting for both the variability of each variable and the correlations between variables. This paper uses a **scaled Mahalanobis distance**, normalized by the number of factors, so that distances remain comparable across factor sets of different sizes.

The ranking now carries an exceedance probability along with a distance measure. Middle East Escalation scores 1.27, a reading exceeded about 35 percent of the time, a bad but far from unprecedented quarter. Adding the AI de-rating channel lifts the score to 2.05, exceeded only 9 percent of the time, as the rate and technology channels switch on together. The Extreme Escalation is a near-record event at 4.11, a level exceeded just 1 percent of the time across the twenty-year sample. The FED Trap reads more moderate at a single three-month point, 0.67 at 5 percent core PCE and 1.45 at 6 percent, exceeded 88 and 22 percent of the time, because its damage accumulates over a full year rather than arriving as a single quarter's shock. The scenarios most worth preparing for are the ones the market is not pricing: the AI de-rating tail and the extreme conflagration.

6 Portfolio Impact for Model Portfolios and Endowments

Section 3 estimates financial asset price movements under varying geopolitical and macro stress tests. This section translates those market moves into portfolio outcomes. The same ten policy-variable shocks are propagated through the

FIS multi-factor statistical model across each investor type's asset allocation, so every figure below is one scenario measured against a different portfolio. The scenarios were applied instantaneously to a set of public equity-bond model portfolios (e.g., 60-40) and ~650 US College and University Endowment funds (representing ~\$900B of assets) based on anonymized fund data reported to NACUBO. Given holdings data is not publicly available, granular public and private asset allocation data were mapped to public and private indices. Public assets were mapped directly to representative market indices. Private asset classes (e.g., private equity, private credit and real assets) were mapped to representative private benchmarks with comparable underlying risk exposures consistent with the FIS factor framework.

US Endowment funds invest in varying levels of public and alternative assets. The table below shows the asset allocation details for the 7 different asset size cohorts for in the NACUBO Endowment data set. Notably, smaller endowments mainly invest in public markets with some alternative investments. As size increases, endowments invest more heavily in alternative assets across asset classes with the >\$5B cohort allocating 37% to public assets and 63% to alternative assets. Larger endowments often have allocations to assets that diversify broad equity market risk, such as diversifying hedge funds (e.g., trend following, low vol, low correlation funds), commodities and infrastructure.

6.1 Endowment Asset Allocation

US ENDOWMENT ASSET ALLOCATION BY SIZE COHORT							
Size cohort	Equities	Fixed income	Private credit	Real estate	Other real assets	Private equity	Hedge funds
Under \$50M	60.2%	26.3%	1.0%	1.5%	3.4%	4.4%	3.3%
\$51M-\$100M	58.2%	25.1%	0.8%	1.9%	3.0%	6.5%	4.4%
\$101M-\$250M	52.7%	20.4%	1.4%	2.8%	3.8%	12.1%	6.6%
\$251M-\$500M	47.8%	18.3%	1.6%	2.3%	4.0%	15.6%	10.4%
\$501M-\$1B	44.7%	14.2%	2.7%	3.6%	3.5%	20.5%	10.6%
\$1B-\$5B	37.6%	11.5%	2.6%	4.1%	4.1%	26.0%	14.0%
Over \$5B	24.6%	12.0%	0.8%	5.8%	5.3%	34.0%	17.4%
Peer Average	46.5%	18.3%	1.6%	3.1%	3.9%	17.0%	9.5%

Table 5: Asset allocation by endowment size cohort. Fixed income includes cash. Private credit is private debt. Real estate is marketable and private real estate. Other real assets are private energy, infrastructure and commodities, following NACUBO, which groups infrastructure under real assets rather than real estate. Rows may not sum to 100 percent because of rounding.

6.2 Tail Scenario Methodology and Results

Methodology: Given endowments invest globally in public and alternative markets, measuring risk and conducting stress tests require modeling public and private assets in a consistent way. This means normalizing private asset data to align with valuation frequency and pricing features of public equities and bonds. Specifically, private assets are valued on a lag and use an appraisal process versus public markets that are marked to market daily. To measure risk, private asset data must be adjusted to remove auto correlation in returns that are arbitrated away in public markets and to align valuation frequency. In the FIS multi-factor statistical model, private asset risk is measured using de-smoothed private asset returns and valuation frequencies are adjusted to weekly using synthetic public assets with the same risk profile. Given the modeling approach, the stress test results treat public and private assets consistently and, therefore do not reflect the valuation smoothing and reporting lag that occur in practice for private assets.

Results: In this study, all four stress scenarios involve an inflationary regime and higher rates which means that historical diversification from holding a 60-40 portfolio of equities and bonds is lost due to positive correlation across these two asset classes. Thus, the model public equity-bond portfolios experience the highest losses across all four scenarios. Despite lower, but high levels of systematic equity risk, endowment funds perform better under the stress scenarios with losses falling monotonically with fund size. This is due to increased allocations to alternatives (particularly diversifying hedge funds and real assets) that diversify equity risk and help offset losses in these inflation-linked stress tests. Importantly, this result is specific to the inflationary scenarios examined in this paper. Larger endowments are not universally lower risk than smaller endowments. Their relative resilience arises because these scenarios reward exposures to real assets and diversifying hedge fund strategies while simultaneously penalizing traditional equity-duration portfolios.

The four stress test scenarios adversely affect endowment portfolios over differing time horizons. The three geopolitical tails are impact events that peak and retrace, and they peak later as they get worse: Middle East Escalation at one month, AI De-rating at two, Extreme Escalation at three. The FED Trap does not retrace at all. It deepens through twelve months, because equities and duration become positively correlated as inflation dominates the macro environment. That shows in the model portfolios, where the 60/40 loses more than the 80/20 relative to its equity weight, since the Fixed Income sleeve adds to the loss rather than offsetting it.

Interpretation: The portfolio stress tests (shown in the tables below) should be interpreted as factor-based estimates of potential portfolio outcomes under the specified scenarios rather than as predictions of future market performance. The analysis applies the scenario-specific market shocks to representative investor portfolios using the FIS multi-factor statistical model and assumes that the historical relationships among risk factors remain broadly representative under the modeled scenarios. Portfolio asset allocations are assumed to remain unchanged over the stress horizon.

Accordingly, the results estimate the sensitivity of representative portfolio structures to the assumed market environments, rather than the expected performance of any specific institution or investment strategy. They are conditional on the modeled scenarios occurring and should not be interpreted as estimates of the probability that those scenarios will occur.

MIDDLE EAST ESCALATION, 1M TO 5M					
Portfolio	1M	2M interpolated	3M interpolated	4M interpolated	5M
MODEL EQUITY-BOND PORTFOLIOS					
80/20 model	-8.9%	-8.4%	-7.9%	-7.3%	-6.8%
70/30 model	-8.1%	-7.6%	-7.2%	-6.8%	-6.3%
60/40 model	-7.3%	-6.9%	-6.6%	-6.2%	-5.9%
US ENDOWMENTS BY SIZE					
Under \$50M	-7.0%	-6.6%	-6.2%	-5.8%	-5.3%
\$51M-\$100M	-6.8%	-6.4%	-6.0%	-5.6%	-5.2%
\$101M-\$250M	-6.1%	-5.7%	-5.3%	-5.0%	-4.6%
\$251M-\$500M	-5.4%	-5.1%	-4.7%	-4.4%	-4.0%
\$501M-\$1B	-5.3%	-4.9%	-4.6%	-4.2%	-3.9%
\$1B-\$5B	-4.4%	-4.1%	-3.7%	-3.4%	-3.1%
Over \$5B	-3.1%	-2.9%	-2.6%	-2.4%	-2.1%
Peer Average	-5.4%	-5.1%	-4.7%	-4.4%	-4.0%

Table 6: All investor types under Middle East Escalation. The scenario set models 1M and 5M only. The 2M, 3M and 4M columns are linear interpolations between those endpoints and are marked as such.

ESCALATION WITH AI DE-RATING, 1M TO 5M					
Portfolio	1M	2M	3M	4M	5M
MODEL EQUITY-BOND PORTFOLIOS					
80/20 model	-12.9%	-14.2%	-13.4%	-11.9%	-11.1%
70/30 model	-11.8%	-13.0%	-12.3%	-11.1%	-10.4%
60/40 model	-10.7%	-11.7%	-11.2%	-10.2%	-9.6%
US ENDOWMENTS BY SIZE					
Under \$50M	-10.4%	-11.5%	-10.9%	-9.7%	-9.0%
\$51M-\$100M	-10.1%	-11.2%	-10.6%	-9.4%	-8.8%
\$101M-\$250M	-9.1%	-10.2%	-9.6%	-8.4%	-7.9%
\$251M-\$500M	-8.1%	-9.1%	-8.6%	-7.5%	-7.0%
\$501M-\$1B	-7.8%	-8.8%	-8.2%	-7.1%	-6.6%
\$1B-\$5B	-6.6%	-7.5%	-7.0%	-6.0%	-5.5%
Over \$5B	-4.7%	-5.6%	-5.2%	-4.3%	-3.9%
Peer Average	-8.1%	-9.1%	-8.6%	-7.5%	-7.0%

Table 7: All investor types under Escalation with AI De-rating.

EXTREME ESCALATION, 1M TO 5M					
Portfolio	1M	2M	3M	4M	5M
MODEL EQUITY-BOND PORTFOLIOS					
80/20 model	-13.3%	-16.6%	-18.5%	-17.0%	-15.2%
70/30 model	-12.3%	-15.5%	-17.4%	-15.9%	-14.2%
60/40 model	-11.3%	-14.4%	-16.2%	-14.8%	-13.2%
US ENDOWMENTS BY SIZE					
Under \$50M	-11.0%	-13.8%	-15.3%	-14.0%	-12.5%
\$51M-\$100M	-10.6%	-13.3%	-14.8%	-13.5%	-12.1%
\$101M-\$250M	-9.4%	-11.8%	-13.0%	-11.9%	-10.7%
\$251M-\$500M	-8.4%	-10.4%	-11.5%	-10.5%	-9.4%
\$501M-\$1B	-8.0%	-9.9%	-10.8%	-9.9%	-8.9%
\$1B-\$5B	-6.8%	-8.4%	-9.1%	-8.4%	-7.6%
Over \$5B	-5.1%	-6.2%	-6.6%	-6.1%	-5.5%
Peer Average	-8.5%	-10.5%	-11.6%	-10.6%	-9.5%

Table 8: All investor types under Extreme Escalation.

FED PERSISTENT INFLATION, 6% CORE PCE, 6M TO 12M		
Portfolio	6M	12M
MODEL EQUITY-BOND PORTFOLIOS		
80/20 model	-18.3%	-21.5%
70/30 model	-17.0%	-20.0%
60/40 model	-15.7%	-18.5%
US ENDOWMENTS BY SIZE		
Under \$50M	-15.9%	-18.7%
\$51M-\$100M	-15.5%	-18.2%
\$101M-\$250M	-14.6%	-17.2%
\$251M-\$500M	-13.4%	-15.8%
\$501M-\$1B	-13.2%	-15.5%
\$1B-\$5B	-12.1%	-14.2%
Over \$5B	-10.1%	-11.9%
Peer Average	-13.5%	-15.9%

Table 9: All investor types under the FED Trap at 6 percent core PCE. The 4.5 and 5 percent regimes are in the appendix.

Appendix: Endowment Portfolio Risk and Stress Detail

A.1 Historical Stress Tests

The table below shows results of applying six historical crisis periods (2008, COVID, 2022, 2011 Sovereign Peripheral Crisis, 2015 China Turbulence and 2016 Global Turbulence) instantaneously to public equity-bond and US endowment portfolios. The results are computed using the actual factor covariance matrix and historical factor variations. In a 2008 or COVID replay the endowments lose more than the 60/40 portfolio, because those are growth shocks in which duration rallies and the balanced portfolio is protected. In 2022 the ordering inverts: the 60/40 loses 22.1 percent against 7.7 percent for the largest endowment cohort. All four scenarios in this paper involve inflationary regimes like 2022, not like 2008. The 2022 results show the benefit of the larger endowments holding diversifying hedge funds and real assets to offset equity risk and in an inflationary environment.

HISTORICAL STRESS TESTS, PEAK TO TROUGH						
Portfolio	2008 GFC	COVID 2020	2022 Inflation and War	Sovereign Downgrade 2011	2015 China Turbulence	2016 Global Turbulence
MODEL EQUITY-BOND PORTFOLIOS						
80/20 model	-28.0%	-27.6%	-24.9%	-12.1%	-5.2%	-12.5%
70/30 model	-24.2%	-24.2%	-23.5%	-10.4%	-4.8%	-11.2%
60/40 model	-20.4%	-20.8%	-22.1%	-8.7%	-4.4%	-9.9%
US ENDOWMENTS BY SIZE						
Under \$50M	-24.6%	-24.9%	-20.2%	-10.8%	-4.8%	-11.8%
\$51M-\$100M	-24.4%	-24.9%	-19.4%	-10.8%	-4.8%	-11.7%
\$101M-\$250M	-25.1%	-25.4%	-17.4%	-11.0%	-4.9%	-12.0%
\$251M-\$500M	-24.6%	-24.9%	-15.2%	-10.8%	-4.7%	-11.7%
\$501M-\$1B	-25.6%	-26.0%	-14.5%	-11.3%	-4.8%	-12.1%
\$1B-\$5B	-25.0%	-25.7%	-11.6%	-11.1%	-4.6%	-11.9%
Over \$5B	-23.3%	-24.5%	-7.7%	-10.5%	-4.3%	-11.3%
Peer Average	-24.7%	-25.2%	-15.1%	-10.9%	-4.7%	-11.8%

Table A1: Historical stress test results, FIS-APT historical events.

A.2 Ex Ante Volatility and Factor Risk

EX ANTE VOLATILITY AND FACTOR RISK, 1Y								
Portfolio	Total volatility	Equity	Credit	Yield Curve	Inflation	FX	Commodities	Other
MODEL EQUITY-BOND PORTFOLIOS								
80/20 model	13.7%	97.2%	0.0%	2.8%	0.0%	0.0%	0.0%	0.0%
70/30 model	12.3%	94.5%	0.0%	5.5%	0.0%	0.0%	0.0%	0.0%
60/40 model	10.8%	90.3%	0.0%	9.7%	0.0%	0.0%	0.0%	0.0%
US ENDOWMENTS BY SIZE								
Under \$50M	12.1%	92.3%	3.1%	3.0%	0.4%	0.6%	0.5%	0.2%
\$51M-\$100M	12.0%	93.1%	2.8%	2.3%	0.5%	0.5%	0.5%	0.3%
\$101M-\$250M	11.8%	93.0%	3.0%	1.1%	0.9%	0.3%	1.2%	0.5%
\$251M-\$500M	11.3%	93.5%	2.8%	0.2%	1.1%	0.2%	1.6%	0.7%
\$501M-\$1B	11.5%	93.2%	2.8%	-0.3%	1.4%	0.0%	1.9%	1.0%
\$1B-\$5B	11.4%	90.8%	2.9%	-0.8%	2.0%	0.2%	3.1%	1.9%
Over \$5B	10.9%	86.5%	3.1%	-0.6%	2.7%	0.2%	4.8%	3.3%
Peer Average	11.4%	92.9%	2.9%	0.2%	1.2%	0.3%	1.6%	0.8%

Table A2: Total ex ante volatility and its decomposition by factor, the latter as a share of total portfolio variance. A negative yield-curve share means the sleeve offsets rather than adds to risk. The volatility column is carried over from the prior workbook, where the row was populated; it is unchanged because the underlying allocations are identical.

The annualized volatilities in this table are computed using June 2026 FIS medium-term volatility models using 180 weekly returns. Total volatility barely separates the cohorts, running from 12.1 percent for the smallest to 10.9 percent for the largest, and the 60/40 portfolio at 10.8 percent is the lowest of all. Equity risk (across all asset classes, such as equity, credit, real estate, hedge funds, etc.) dominates every portfolio explaining 86.5% to 93.5%, showing that even alternatives-heavy endowments still carry meaningful equity beta risk. However, non-equity factor exposures vary based on type of portfolio. The model portfolios carry all non-equity risk in the yield curve, rising to 9.7 percent for the 60/40. The endowments carry almost none, and instead pick up inflation and commodity risk that grows with size, from 0.4 and 0.5 percent in the smallest cohort to 2.7 and 4.8 percent in the largest. That is the real assets exposure in Table 5, and it is why the large cohorts hold up better in the oil-driven tails.

A.3 Ex Ante Risk and Potential Losses

EX ANTE TAIL RISK MEASURES			
Portfolio	Monte Carlo VaR 95%, 1Y	Extreme Shortfall 95%, 1Y	Maximum Drawdown 99%, 1M
MODEL EQUITY-BOND PORTFOLIOS			
80/20 model	25.1%	30.1%	37.5%
70/30 model	22.4%	26.9%	33.5%
60/40 model	19.9%	23.9%	29.7%
US ENDOWMENTS BY SIZE			
Under \$50M	21.7%	26.1%	33.2%
\$51M-\$100M	21.4%	25.7%	32.7%
\$101M-\$250M	21.3%	25.6%	32.1%
\$251M-\$500M	20.5%	24.7%	30.7%
\$501M-\$1B	21.1%	25.4%	31.3%
\$1B-\$5B	20.9%	25.1%	30.5%
Over \$5B	20.0%	24.0%	28.5%
Peer Average	20.7%	25.0%	31.0%

Table A3: Ex ante tail risk. All figures are losses, stated as positive percentages. Monte Carlo VaR and Extreme Shortfall are 95 percent one-year measures. Maximum drawdown is a 99 percent one-month measure.

These risk measures estimate potential losses on an ex-ante basis based on variance / covariance data and the FIS multi-factor statistical risk model. Tail risk measures such as Value-at-Risk (VaR) and Extreme Shortfall (based on a 1Y time horizon and 95% confidence level) and Maximum Drawdowns (1M and 99% confidence level) compress far more than the scenario results do. One-year 95 percent VaR runs from 21.7 percent for the smallest cohort to 20.0 percent for the largest, a spread of under two points, while the FED Trap at twelve months separates the same two cohorts by nearly seven. Ex ante measures are calibrated on full-sample covariance and do not know that a shock is inflationary. That gap is the case for scenario work alongside VaR, not instead of it.

A.4 Portfolio Impact, FED Trap at 4.5% and 5% Core PCE

FED PERSISTENT INFLATION, 4.5% CORE PCE, 6M TO 12M		
Portfolio	6M	12M
MODEL EQUITY-BOND PORTFOLIOS		
80/20 model	-4.5%	-6.9%
70/30 model	-4.1%	-6.3%
60/40 model	-3.7%	-5.6%
US ENDOWMENTS BY SIZE		
Under \$50M	-3.9%	-6.0%
\$51M-\$100M	-3.8%	-5.8%
\$101M-\$250M	-3.6%	-5.6%
\$251M-\$500M	-3.4%	-5.2%
\$501M-\$1B	-3.4%	-5.1%
\$1B-\$5B	-3.1%	-4.8%
Over \$5B	-2.6%	-4.0%
Peer Average	-3.4%	-5.2%

FED PERSISTENT INFLATION, 5% CORE PCE, 6M TO 12M		
Portfolio	6M	12M
MODEL EQUITY-BOND PORTFOLIOS		
80/20 model	-10.4%	-13.8%
70/30 model	-9.5%	-12.7%
60/40 model	-8.7%	-11.7%
US ENDOWMENTS BY SIZE		
Under \$50M	-9.0%	-12.0%
\$51M-\$100M	-8.8%	-11.7%
\$101M-\$250M	-8.3%	-11.1%
\$251M-\$500M	-7.7%	-10.3%
\$501M-\$1B	-7.6%	-10.1%
\$1B-\$5B	-7.0%	-9.3%
Over \$5B	-5.9%	-7.9%
Peer Average	-7.8%	-10.4%

Appendix: Methodology

The factor set follows the FIS global multi-asset class statistical factor model, which is the same framework used in the reference risk documentation this study builds on. Shocks are applied as additive percentage changes for prices and additive basis-point changes for yields and spreads, so a plus-70-percent oil shock and a plus-285-basis-point spread shock are both changes layered onto the August 14 baseline rather than absolute targets. The covariance matrix for this risk model is estimated using 180 weeks of equally weighted returns. The covariance structure used later for the distance analysis comes from a backtest that runs on monthly data from 2006 forward (with 3-year windows for historical events). That window is deliberately long, because it needs to contain enough genuine crises to serve as a fair yardstick. It covers the 2008 global financial crisis, the 2011 European debt scare and 2015 China devaluation risk-off episodes, the 2020 pandemic crash, and the 2022 inflation shock, which together give the model a realistic sense of how far markets can actually move and, just as importantly, how the factors tend to move together when they do.

It is worth pausing on the raw volatility of the factors, because it explains why an oil-driven scenario scores as extreme earlier in the paper. The table below gives the annualized volatility of selected return-based factors as estimated by the backtest. Oil stands far above everything else, which means a given percentage move in crude represents far fewer standard deviations than the same percentage move in a low-volatility factor, so it takes a much larger oil move to reach the same level of statistical extremity, and it is the single biggest reason the oil tails dominate the distance analysis in Section 5.

ANNUALIZED FACTOR VOLATILITY, 2006-ONWARD BACKTEST	
Factor	Annualized volatility
Oil (WTI)	36.3 percent
Russell 2000	20.1 percent
Gold	18.2 percent
Nasdaq 100	18.1 percent
S&P 500	13.0 percent
US Dollar Index	6.3 percent
US High Yield	4.1 percent

Table 10: Annualized factor volatility from the 2006-onward backtest.

**This document does not constitute investment advice. Scenarios are modeled estimates designed to stress-test portfolio resilience under extreme but plausible geopolitical and macroeconomic conditions. Date: August 15, 2026.*

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